Environmental Impact Assessment Study for a Proposed Chlor-alkali Plant and Associated Infrastructure at Point Lisas, Trinidad and Tobago

July 2008 - Revised January 2009

APPENDICES

Prepared for:
CariSal Trinidad Unlimited

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APPENDIX A
TERMS OF REFERENCE

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Our Ref. CEC1743/2006

August 16, 2007

FAXED 21 AUG 2007

CariSal Trinidad Limited
c/o TTEK Project Management Ltd.
Building K2
Demerara Drive
POINT LISAS

ATTENTION: MR. ROGER MOORE

Dear Sir,

APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL CLEARANCE (CEC) BY CARISAL TRINIDAD LIMITED FOR A CHLOR-ALKALI PLANT AND ASSOCIATED INFRASTRUCTURE AT POINT LISAS.

Previous correspondence on the above caption ending with your letter dated July 31, 2007 detailing proposed modifications to the draft Terms of Reference (TOR) refers.

The Environmental Management Authority (EMA) informs you that changes were made to the Terms of Reference based on comments received from various stakeholders as outlined in your letter, and these are outlined in the attachment to this letter. As such, the Final ToR is hereby submitted to CariSal in accordance with Rule 5(3) of the Certificate of Environmental Clearance (CEC) Rules, 2001, and is effective from the date of this correspondence. It consists of twenty-nine (29) pages, including an appendix.

Please contact us at 628-8042 if you require additional information/clarification.

Yours sincerely,
ENVIRONMENTAL MANAGEMENT AUTHORITY

Dave McIntosh
MANAGING DIRECTOR/CEO

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21 AUG 2007

8 Elizabeth Street, St. Clair, Port of Spain, Trinidad & Tobago, West Indies.
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DIRECTORS: Dr. John Agard (Chairman), Mr. David Abdulah, Dr. Dave McIntosh (Managing Director/CEO),
Dr. Rohit Doon, Ms. Molly R. Gaskin, Mr. Ruben Mc Sween, Mr. Raye Sandy, Dr. Carol James, Mrs. Nafessa Mohammed

ATTACHMENT – CHANGES MADE TO THE DRAFT TERMS OF REFERENCE

The following changes were made to the TOR:

Section 1.1 – Background Information

Page 4, paragraph 1-

The following sentence was added:

CariSal has identified carbon dioxide, hydrochloric acid gas, calcium fines entrained in the exhaust gas, water vapour and nitrous oxides as emissions associated with the proposed plant.

Page 4, paragraph 2

EASI Industries was modified to:

Easi Industrial Supplies Limited (EISL).

Section 2. – Requirements for Environmental Impact Assessment and EIA Report

Page 7, Subsection 2.1.2

Use of GIS was expanded to include the following (bullet 13):

- *Locations of adjacent industrial facilities operating or planned for the area;.*

Subsection 2.2 – Description of the Project

Page 8, paragraph 1

The following sentence was added:

The site plan should include the proposed site in relation to the DESALCOTT, TEIL and EASL as well as adjacent existing and planned industrial plants.

Page 8, bullet 2, subsection: Process Description

The following sentence was added to this section:

Flow diagrams shall be utilised as far as possible to illustrate all stages of the process.

Page 8, bullet 2, point 1, subsection: Process Description
normal operational capacity was modified to:

normal and increased operational capacity.

Page 9, point 1, subsection: Process Description

The water requirements for construction, start-up, normal, worst-case conditions and emergency; was modified to:

- *The water requirements for construction, start-up, normal, worst-case conditions, emergency and decommissioning. Provide an explanation on how the plant is designed to produce no discharge during its operations*;

Page 9, point 3, subsection: Process Description

- *An identification of the source, quantity and composition of all sources of potential liquid wastes (e.g. Sour water, process water, cooling water blow down) as well as sewage and storm water that will be generated and describe how they will be managed (i.e. containment, treatment and disposal) and what special risks (if any) they pose. The treatment and collection of all liquid effluent generated may best be depicted on a flow diagram. The layout of the on site drainage system should be clearly depicted on a site plan that includes all discharge points (if any, inclusive of cooling water blow down)*;

was modified to :

- *An identification of the source, quantity and composition of any source of potential liquid wastes (e.g. Sour water, process water, cooling water blow down) as well as sewage and storm water that will be generated during construction, start-up, normal, worst-case conditions, emergency and decommissioning and describe how they will be managed (i.e. containment, treatment and disposal) and what special risks (if any) they pose. The treatment and collection of any liquid effluent generated during construction, start-up, normal, worst-case conditions, emergency and decommissioning may best be depicted on a flow diagram. The layout of the on site drainage system should be clearly depicted on a site plan that includes all discharge points (if any, inclusive of cooling water blow down)*;

Page 10, bullet 1, subsection: Process Description

Section 2.2 Description of the Project was expanded to include the following:

- *A description of the water balance to achieve zero discharge from the plant operations, explaining the how process water (inclusive of start up or blow down streams) is recycled, or otherwise retained within the process without being released into the environment;*

Page 10, bullet 1, 4 & 5, subsection: Process Description:

Section 2.2 Description of the Project was expanded to include the following:

- *Description of arrangements for worker housing such as a temporary labour camp;*
- *Decommissioning – Describe proposals for the decommissioning of the Plant. Include replacement by alternative proposals;*
- *Identification of structures and other physical assets that will be subject to displacement due to project-related works;*

<u>Section 2.3 – Description of the environment</u>

Page 11, subsection: 2.3.1 Physical environment; Climate and Air Quality

Air Quality - describe, assess and discuss appropriate ambient air quality parameters was expanded to:

Air Quality - describe, assess and discuss appropriate ambient air quality parameters inclusive of, but not limited to, Chlorine, VOCs, SO_2, NO_x, CO. Historical air quality should be presented to supplement the present air quality measurements for the emissions associated with the proposed plant;

Page 11, subsection: Ambient Noise

Ambient noise level studies should provide all relevant data with respect to the following for nearby residential areas (...) was expanded to:

Ambient noise level studies should provide all relevant data with respect to the following for nearby receptors with particular reference to nearby residential areas (...)

Pages 11, subsection: Geology and Soils

Geology and soil characteristics of the site was expanded to include the following bullets:

- *Depth at which the water table lies (and the extent of ground water)*
- *Soil/substratum shear strength and compressibility*
- *Vulnerability to the different types of land slippage and/or subsidence;*

Suitable soil-boring and test pit surveys should be conducted on-site to gather this information.

- *Structural geology and seismology of the area should be determined and related to the compatibility of the proposed use and site preparation activities*
- *Hydrogeology and groundwater resources – describe the existing groundwater regime in the local study area and identify the existence and type of aquifers in the local study area*

Page 12, subsection: 2.3.2 Socio-economic environment

Provide information on the economic effects of the project, including, but not limited to the following (...) was modified to:

Provide information on the baseline socio-economic conditions of the project, including, but not limited to the following (...)

The demographic profile of the population who may be affected by the proposed development was modified to:

- *The demographic profile of the population, located in the study area, with particular reference to groups/individuals whose livelihood may be affected by the proposed development;*

Section 2.3.2 on the Socio-economic environment was expanded to include the following bullets:

- *Identification of occupants of parcels located in the project area subject to relocation/resettlement using cadastral information as related to the proposed project;*
- *Existing land use in the study area inclusive of the industrial environment in the study area;*

Page 14, Section: 2.5 Determination of the Potential Impacts of the Proposed Project,

This section on the Determination of the Potential Impacts of the Proposed Project was expanded to include the following issues on the Release of chlorine:

- *Release of chlorine, including, but not limited to, such aspects as:*
  - *Dispersion modelling for chlorine exposure beyond the property line of the plant, provided;*

- *A full description of the model(s) used shall be given (i.e. validation, calibration and limitations of the model) and the sensitivity of such model(s) to variations in the input parameters must be stated;*
- *The dispersion modelling must be based on the resident meteorological conditions (e.g. wind speed humidity) of the proposed site considering a number of variations in operating and climatic/atmospheric conditions (inclusive of upset conditions) to extrapolate ground level pollutant concentrations;*
- *Details should be provided on the chlorine emissions profile (type, rate, concentration and source) for the facility including point and area sources;*
- *Models should furnish 1 hour and 24-hour averages for ground level pollutant concentrations;*
- *The results of the modelling should be evaluated with respect to the relevant standards with particular respect to those included in the Draft Air Pollution Rules;*
- *The impact shall be analysed in terms of possible impacts on ecosystems and human health in the area;*

Project Impacts on Air Quality. This section on air quality was expanded to include the following:

> *The EIA is expected to conduct modelling of the plant's expected emissions. Further, the EIA is expected to conduct modelling of the cumulative effects that may result from emissions from the proposed plant.*

Page 16, bullet 1, point 1; Water Quality Impacts

The following bullets were modified in this subsection:

- *The impact of outfall (sewage and any process effluent) water on the ambient water quality at the discharge point; the cumulative impacts of continuous/long term discharge at the proposed site outfall point(s) of the project site (...)*

was modified to:

- *The impact of any discharge during construction, start-up, normal, worst-case conditions and emergency on the ambient water quality at the discharge point; the cumulative impacts of continuous/long term discharge at the proposed site outfall point(s) of the project site;*

Also

- *Impacts of discharged cooling water on ambient conditions and effect upon marine life; discuss continuous/long term impacts of abstraction and discharge (...)*

was modified to:

- *Impacts on ambient conditions of any discharge during construction, start-up, normal, worst-case conditions, emergency and decommissioning;*

The subsection on the impacts on water quality was expanded to include the following bullet:

- *Possibility of groundwater contamination;*

Pages 14-17, Section: 2.5 Determination of the Potential Impacts of the Proposed Project,

The impacts included in this section were reordered as follows:

Air Quality, Dust, Release of chlorine, Water Quality, Drainage, Solid Waste, Flora and Fauna, Soil, Human Beings, Noise followed by other associated impacts.

Page 17, Impact on Human beings

This subsection was expanded to include:

- *Disruption of traditional access routes and uses of the area during site preparation, construction and operational phases of the project such as agriculture, fishing, recreation, community facilities and institutions;*

Page 17, Section: 2.5 Determination *of the Potential Impacts of the Proposed Project.*

This section was expanded to include the following bullet:

- *Access and use of existing and proposed areas of archaeological, cultural and/or historic value;*

Page 19, Section 2.5.1 Assessment of Risk

This section was expanded to include the following in the development of the Emergency Response Plan:

- *Outline the components and structure of the emergency response team, defining their qualifications and roles as emergency response team members;*

Page 20 Section: 2.7 Development of a Management Plan to Mitigate Negative Impacts

The aforementioned title for this section was modified to:

2.7 Development of an Environmental Management Plan to Mitigate Negative Impacts

The following bullet was removed:

- *Water Management Plan which outlines measures for ensuring efficient use of water including alternatives to reduce freshwater consumption such as water minimisation, recycling and conservation; permanent or temporary alterations or diversions to watercourses and water bodies, and, factors used in the design of water management facilities; describe how these plans would be incorporated into the project design;*

Page 21, section: 2.7

- *Wastewater Management Plan to address all wastewater streams from the proposed facilities*

was modified to:

- *Wastewater Management Plan to address any wastewater streams (inclusive of blow down streams) from the proposed facilities;*

Page 22, Section 2.7

- *Plans to verify the accuracy of predictions or to determine the effectiveness of mitigation plans*

was modified to:

- *Monitoring plans to verify the accuracy of the modelling predictions or to determine the effectiveness of proposed mitigation plans;*

Page 22, Section 2.7

- *A conceptual contingency plan that considers environmental effects associated with upset conditions such as serious malfunctions or accidents (..)*

was modified to:

- *A conceptual contingency plan that considers environmental effects associated with upset conditions such as instances of zero brine flow or reduced brine flow from DESALCOTT during planned or unplanned shutdowns. The contingency plan should also address serious malfunctions or accidents at the proposed calcium chloride plant;*

Section 2.7 *Development of an Environmental Management Plan to Mitigate Negative Impacts* was expanded to include:

- *Should the project require the displacement of private structures and other physical assets that will be subject to displacement due to project-related works, this should be documented in the main text of the report and a summary of the agreement between the relevant parties provided as an appendix to the EIA;*

3. The EIA Report

Page 24

The suggested format for the EIA was adjusted to include:

- *Emergency Response Plan (ERP)*

CERTIFICATE OF ENVIRONMENTAL CLEARANCE RULES, 2001

Final Terms of Reference for the Environmental Impact Assessment in respect of:

CEC1743/2006– Application for a Certificate of Environmental Clearance (CEC) by CariSal Trinidad Limited for a chlor-alkali plant and associated infrastructure at Point Lisas.

1. Introduction

The Environmental Management Authority (EMA) received an application for a Certificate of Environmental Clearance (CEC) from CariSal Trinidad Limited (CariSal) on December 22, 2006. The application entails the proposed establishment of a chlor-alkali plant for the production of calcium chloride, caustic soda, sodium hypochlorite and hydrochloric acid with high quality distilled water as a by-product. CariSal has been allocated 11.8 ha of land for the chlor-alkali plant as part of a lease agreement with the National Energy Corporation (NEC). The application was made in accordance with the CEC Rules, 2001 and the following activities of the CEC (Designated Activities) Order, 2001:

20 (a) The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works), of a chemical manufacturing plant.

The EMA has determined that there would be significant environmental impacts that could arise from these activities and that the application requires a CEC and an Environmental Impact Assessment (EIA) in compliance with a Terms of Reference (TOR). The TOR will serve as a guide for the conduct of the EIA and the preparation of an EIA Report in an effort to understand the scope of the project, the potential impacts and the measures that should be taken to mitigate these impacts.

While every attempt has been made to ensure that this TOR addresses all of the major issues associated with this proposal, they are not necessarily exhaustive and should not be interpreted as excluding matters deemed to be significant but not incorporated in them, or matters (currently unforeseen) that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIA. It should be noted that the preparation of terms of reference for this Environmental Impact Assessment does not indicate approval or support in any way, nor does it indicate approval in principle.

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1.1 Background Information

The chlor-alkali plant is bounded on the north by a drainage channel and a proposed urea ammonia nitrate (UAN) Complex, on the east by a National Gas Company of Trinidad and Tobago Limited (NGC) pipeline corridor as well as a Trinidad and Tobago Electricity Commission (T&TEC) corridor, on the west by the Southern Main Road and the existing Point Lisas Port Development Company (PLIPDECO) as well as the Point Lisas Industrial Estate, and on the south by the North Sea Road with the proposed Essar Steel plant further southeast.

The proposed plant will operate production lines for caustic soda (NaOH), sodium hypochlorite (bleach: NaOCl), hydrochloric acid (HCl) and calcium chloride ($CaCl_2$); two for calcium chloride and two for caustic soda. The plant will use a three-stage purification process to convert waste brine from DESALCOTT (Desalination Company of Trinidad and Tobago Limited) into calcium chloride.

The Chlor-Alkali Plant

The chlor-alkali plant produces three chemicals (chlorine, hydrogen and alkali), which are simultaneously produced as a result of the electrolysis of saltwater (or brine) either in the form of a solution of common table salt (sodium chloride) in water or from waste brine from DESALCOTT. The plant will employ the membrane cell process endorsed by the World Bank as a preferred process for chlor-alkali plants.[1] In the membrane cell process, the chlorine (at the anode) and the hydrogen (at the cathode) are kept apart by a selective polymer membrane that allows the sodium ions to pass into the cathodic compartment and react with hydroxyl ions to form caustic soda. The depleted brine is dechlorinated and recycled to the input stage.

Calcium chloride produced at the plant (100,000 metric tonnes per year [mt/yr]) will be primarily sold to the ice melt market and as a component of drilling mud and completion fluid for the oil/gas industry.

Caustic soda (estimated at 100 000 mt/yr) would be converted into bleach (8,000 mt/yr) to serve the local market. Hydrochloric acid (HCl) will be produced at the rate of about 85,191 mt/yr (as 32-36% HCl solution in water), 67,244 mt/yr would be converted to calcium chloride and the balance (17,947 mt/yr) sold in the local and export markets. The mix of calcium chloride/hydrochloric acid would depend on market demands.

CariSal plans to sell it excess CO_2 (approximately 27,230 mt/yr) to Trinidad Energy Investments Limited (TEIL).

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[1] World Bank, Environmental Department. 1998 Chapter on "Chlor-Alkali Plants " in Pollution Prevention and Abatement Handbook, 1998.

CariSal will utilise steam and electricity to concentrate weak salt brine solution provided by DESALCOTT, and converting 32% caustic soda to 50% caustic soda, and 42% calcium chloride liquid to 72% calcium chloride.

The energy sources are natural gas and electricity. Electricity will be provided by T&TEC at 45.5 MW. To provide the energy for the evaporation process, natural gas supplied by NGC is fed directly into the boiler and dryer. The boiler produces steam.

CariSal's estimated energy usage is shown in the table below:

Figure 1
Proposed Total Energy Usage

Source of Energy	Estimated quantity	Unit of measurement
Electrical	45.5	MKWH
Natural Gas	7,338	mcf/day
Steam	40,247	Kg/Hr

Water is brought in from three sources, the weak salt brine solution from DESALCOTT (284 cubic meters of water per hour), water purchased from WASA (6.1 cubic meters of potable water per hour) and rainwater collected from the process area (an average of 4.6 cubic meters per hour). This amounts to a total of 295.2 cubic meters per hour of water to be inputted into the CariSal operation. All process water streams are treated and reused. Furthermore, 201.1 cubic meters per hour water would leave the process as product dilution, cooling tower drift, drier vents and other miscellaneous streams.

The net balance 94.1 cubic meters per hour (distilled water from the evaporation process) is transferred to WASA. It is proposed that the distilled water quantities for export to WASA (subject to their approval) as industrial water would vary with the product mix.

Process cooling will be provided by a cooling tower system circulating 4874 m^3/hr with a purge stream of 24.37 m^3/hr. This cooling tower purge stream will be filtered to remove the suspended solids and would be recycled to the process water retention basin. CariSal proposes that there would be no wastewater discharged from the plant.

The operations of the plant will be continuous (24 hours per day, 7 days a week) with 15 days for O&M (Operations and Maintenance).

CariSal has identified carbon dioxide, hydrochloric acid gas, calcium fines entrained in the exhaust gas, water vapour and nitrous oxides as emissions associated with the proposed plant.

Ex situ caustic facilities

Ex-situ infrastructure to support the operations of the proposed plant include the establishment of a new shore tank (with a storage capacity of 2,500,000 gallons or 9,415 m^3) to be located at the existing Easi Industrial Supplies Limited (EISL) site on the Point Lisas Industrial Estate for the storage and shipping of caustic soda. EISL has been storing, handling and distributing a continuous supply of caustic soda to the local market since its establishment in 1970. EISL would be responsible for the operation and management of the proposed storage tank. CariSal will construct a pipeline from the on-site caustic soda storage tanks to the tank on the EISL site but the product and the pipeline from the CariSal plant to the EISL tank would be owned and operated by CariSal. The tank would be owned and operated by EISL. CariSal proposes that the six-inch (6") pipeline will be buried four feet (4') or 1.22metres underground or strung above on sleepers, where appropriate, in an effort to ensure safety and integrity.

Brine and Sodium Hypochlorite Facilities (bleach)

One (1) eight inch (8") pipeline will be constructed from the DESALCOTT site in Point Lisas to the CariSal plant. The pipeline would contain waste brine from DESALCOTT. The line will be buried 1.22 meters underground, where appropriate, or strung on sleepers. Waste brine will be pumped from DESALCOTT to CariSal 24hours per day, 7 days a week. There will be a pump on the DESALCOTT site but it would be maintained by CariSal as part of an agreement between CariSal and DESALCOTT.

CO_2 Pipeline facilities to TEIL

CariSal also proposes a pipeline right of way for the delivery of CO_2 to Trinidad Energy Investment Limited (TEIL). The sale of CO_2 to TEIL is an element of CariSal's plan to reduce the greenhouse gas emissions associated with the project.

1.2 Objectives

The scope of the environmental impact assessment will be to determine the type and extent of environmental and social impacts arising from the proposed facility, at the same time examining the cumulative impacts of the plant with other activities and industrial projects existing or planned for the area including the proposed South East Point Lisas Industrial Estate and the PLIPDECO industrial estate.

In this context the EIA is expected to make an assessment of the project and ancillary activities required for its viability with a view to making accurate predictions of the possible impacts to the baseline conditions of the study area. It also includes the management of any significant, negative and residual environmental impacts through mitigation, implementation of a monitoring plan to ensure the mitigation measures are effective and the assessment of hazards and risks associated with the proposed activity. Particular emphasis should be placed on evaluating possible changes to ambient air quality from plant emissions, impacts on the community and neighbouring areas as a result of emissions from point and non-point sources (i.e. the chlorine proposed as a temporary product in the process). The effects of runoff and effluent from the project site, which may result from either developmental or operational phases on water resources, should also be investigated.

1.3 Legal Framework

The CEC Rules, 2001 were made under section 26(h) of the Environmental Management (EM) Act, 2000 and came into effect on July 7, 2001. The CEC (Designated Activities) Order, 2001 outlines a list of activities that require a CEC from the EMA before such activities can commence. The establishment of the proposed chlor-alkali plant and associated infrastructure is consistent with the aforementioned Designated Activities (See Introduction) of the CEC Order, 2001.

The CEC Rules describe the process to apply for and obtain a CEC. Rule 5(1) of the CEC Rules describes the process for preparation of the TOR for an EIA, while Rule 10 outlines the standards of preparation of the EIA. This environmental assessment is requested in accordance with the relevant sections and rules of the EM Act and CEC Rules, respectively.

In order to be environmentally acceptable, the establishment of the facility must be in compliance with international standards or guidelines where the pertinent local standards or guidelines have not been formalized. Local environmental standards or guidelines, which are applicable to CEC application **CEC1743/2006**, include, but not be limited to, the following:

- TTS 547:1998 (Specification for the Effluent from Industrial Processes Discharged into the Environment)
- TTS 417:1993 (Specification for liquid Effluent from Domestic Wastewater Treatment Plants into the Environment)
- Water Pollution Rules, 2001 as amended in the Water Pollution (Amendment) Rules 2006
- Noise Pollution Control Rules, 2001
- Draft Air Pollution Rules, 2005
- National Environmental Policy
- Occupation Health and Safety Act (2006 as amended)

International standards or guidelines can be sourced from the United States Environmental Protection Agency (USEPA), World Bank, World Health Organization (WHO), Multilateral Environmental Agreements or other appropriately referenced and available material.

2. Requirements for Environmental Impact Assessment and EIA Report

2.1 Study Area

The study area should be determined by the extent of direct and indirect impacts on the physical, biological and social environments. This should include the area of proposed works, other facilities within the general area, and associated areas such as the main site outfall points (inclusive of storm water) leading to the marine environment. Surrounding communities that can be affected by noise, air emissions, emergencies or upset conditions also need to be considered in defining the study area.

The study area should be properly delineated (UTM referencing or WGS84) and described with accompanying photographs, aerial photos, land-use, topographical and geological maps, and any other diagrams at easily understood scales to illustrate the spatial extent of the project and the impact area. The rationale used to select the EIA study area should also be explicitly described.

2.1.1 Mapping

Mapping, as referred to in this TOR, shall be considered to be appropriately scaled spatial data as represented in digital or printed format. All spatial data shall, as far as possible, be presented on a CD ROM medium using a Geographical Information System (GIS) format readily compatible with ArcView Version 3.2. The use of GIS would not otherwise exclude the use of photographs, map sheets and diagrams at easily understood and appropriate scales to illustrate the spatial extent of the project and the impact area. Printed maps of the site area should indicate the layout of the proposed facilities in the context of the immediate site as well as with respect to the wider study area. Each printed map should be at appropriate/easily-understood scales for the overview being illustrated (e.g. 1:10 000 or 1:5000 for site plans). The definition of the study area should guide the extent of mapping provided for this project to illustrate existing infrastructure and/or natural features in the concerned area.

2.1.2 Use of GIS

The scale and nature of this intended project and the study area requires the use of GIS to represent spatial data wherever practicable. Submitted data should be presented in a working GIS project readily compatible with ArcView version 3.2 and organised into discrete themes (i.e. shape files – point, raster and vector data). Data themes should illustrate, but not necessarily be limited to, the following features/attributes:

- Site boundaries
- Roads (all classes)
- Built development in the wider study area (e.g. residential, institutions – schools, hospitals etc.)
- Water resources – rivers/streams, standing water bodies, aquifers/groundwater resources, municipal wells as applicable.
- Civil infrastructure (e.g. pipelines, etc)
- Pre- and post-development topography (contour lines at appropriate intervals, preferably in metres)
- Sampling points for baseline data
- Proposed monitoring stations/points
- Proposed general drainage of the area with effluent points
- Proposed buffer zones
- Site layout
- Corridors for utilities, pipelines, conveyor/delivery systems
- Locations of adjacent industrial facilities operating or planned for the area
- Soil types
- Vegetation types

For features in themes to which particular emphasis is to be placed, consideration should be given to linking photographs wherever they are available. Themes should be clearly labelled/annotated as necessitates.

Map units and distance should be set in metres and kilometres respectively, while the UTM projection should be utilised. GIS, as far as practicable, should be utilised to illustrate the current features of the study area as well as the planned development for the completed project.

2.2 Description of the Project

The description of the project will include a justification statement and detailed descriptions of the project's phases and activities. A site plan at a scale of 1:5000 (or other appropriate level) should be provided to indicate the general layout of the proposed facilities as well as its relationship with the study area.

The site plan should include the proposed site in relation to the DESALCOTT, TEIL and EISL as well as adjacent existing and planned industrial plants. Where necessary, appropriate plans should be included at relevant scales to facilitate easy comprehension of location, design, construction or operational processes.

Provide sufficient scope and detail in the project description information to allow for quantitative assessment of the environmental consequences where practicable. If the scope of information varies among components, processes or phases of the project, provide rationale demonstrating that the information is sufficient for assessment purposes.

Detailed information on the project should be provided and must include the following:

- Site Location, Size and Layout – Describe the overall positioning of plant equipment and buildings/infrastructure for the chlor-alkali plant inclusive of all associated infrastructure linking to ex-situ structures under the scope of the **CEC1743/2006** such as pipelines to DESALCOTT, TEIL and EASI Limited and other associated components (e.g. process equipment, storage areas, drainage areas, pipelines, location of stacks and other points of emissions etc.) in relation to one another and the surrounding areas. This should show shapes, boundaries, rivers, streams, outfalls, community settlements, oil and gas infrastructure, existing public utilities infrastructure and existing and proposed neighbouring tenants. ;

- Process Description – Describe all stages of production (cell membrane electrolytic process, Mechanical Vapour Recompression, etc.). Flow diagrams shall be utilised as far as possible to illustrate all stages of the process. The process description shall include, but not be limited to, the following details:

  - Design basis, design capacity and normal and increased operational capacity (stating all design codes and standards employed);
  - Process equipment and machinery;
  - Source and description of all major feed and raw materials, intermediates and subsidiary inputs used in the production process as they relate to normal operations and maintenance. This should also include estimates of quantities in stock and on-site storage arrangements such as containment and location;
  - An identification and description of the final product(s) derived including rate of production and chemicals/material storage arrangements;
  - A description of utilities (e.g. water, electricity) in terms of requirements, availability, sources and plans for obtaining such;

- The water requirements for construction, start-up, normal, worst-case conditions, emergency and decommissioning. Provide an explanation on how the plant is designed to produce no discharge during its operations;
- An identification and description of all hazardous and non-hazardous substances to be stored or handled onsite as well as a description of how they will be managed (containment and handling) inclusive of details on special risks (if any) that they pose;
- An identification of the source, quantity and composition of any source of potential liquid wastes (e.g. Sour water, process water, cooling water blow down) as well as sewage and storm water that will be generated during construction, start-up, normal, worst-case conditions, emergency and decommissioning and describe how they will be managed (i.e. containment, treatment and disposal) and what special risks (if any) they pose. The treatment and collection of any liquid effluent generated during construction, start-up, normal, worst-case conditions, emergency and decommissioning may best be depicted on a flow diagram. The layout of the on site drainage system should be clearly depicted on a site plan that includes all discharge points (if any, inclusive of cooling water blow down);
- A description of the water balance to achieve zero discharge from the plant operations, explaining the how process water (inclusive of start up or blow down streams) is recycled, or otherwise retained within the process without being released into the environment;
- An identification of the source and quantity of all hazardous and non-hazardous solid waste that are expected to be generated and a description of how they will be managed (i.e. containment, treatment and disposal) and what special risks (if any) they pose. The treatment and collection of solid wastes may best be depicted on a flow diagram;
- Describe the transport of process and waste/spent material (e.g. catalysts, products, input chemicals) to and from the site on an operational basis;
- An identification of the source and estimation of the quantity and concentration of air emissions and noise levels (i.e. average and peak levels at the fence line) generated from this type of facility;
- A comprehensive listing and description of hazardous materials to used (along with their Material Safety Data Sheets furnished in an appendix) should be provided. The maximum quantities of those materials to be stored must be stated along with the maximum quality of each of those materials to be utilised in the process at any given time. The storage and transport of such material, as well as safety precautions for their use, storage and disposal must be

stated. A detailed description of any processes involving these materials is also required;
- Identification of options for the transport and handling of materials for the site;

- Description of all other associated works and infrastructure required for the establishment and operation of the facilities. Include:

  - Description of activities that would occur during, construction/ engineering operations and start-up of operations;
  - A breakdown of the labour force, type of employment and number of employees anticipated to be required during the construction and operational phases of the project;
  - Description of arrangements for worker housing such as a temporary labour camp;

- Description of activities to be undertaken during each phase of the project;

- Proposed scheduling of the project.

- Decommissioning – Describe proposals for the decommissioning of the Plant. Include replacement by alternative proposals;

- Identification of structures and other physical assets that will be subject to displacement due to project-related works;

2.3 Description of the Environment

Conduct a literature review to determine the current status of data and information on the study area as they relate to the current physical, biological and socio-economic environments. The applicant shall undertake field studies to fill identified data gaps to provide a comprehensive description of the human and natural environments. Include changes that may occur before your project commences in light of previous, ongoing or future activities that could reasonably be determined to have a combined effect. Details of the study area should include the following:

2.3.1 Physical environment

Climate and Air Quality

- A description of the wind regime of the area, including wind speed and direction; prevailing wind conditions, seasonal variations and storm conditions.

- Rainfall, including seasonal variations;
- Air Temperature and Relative Humidity;

Air Quality - describe, assess and discuss appropriate ambient air quality parameters inclusive of, but not limited to, Chlorine, VOCs, SO2, NOx, CO. Historical air quality should be presented to supplement the present air quality measurements for the emissions associated with the proposed plant;

Ambient Noise

Ambient noise level studies should provide all relevant data with respect to the following for nearby receptors with particular reference to nearby residential areas:

- Peak and average sound pressure levels;
- Transportation noise levels;
- Background noise levels;

Ambient sound pressure level monitoring should be conducted during morning, day and night periods to obtain representative levels and a range of descriptors used to ensure the respective areas are adequately characterized. Ambient sound pressure levels should also be plotted on a noise level contour map (or another map of exact scale and range) corresponding to an area encompassing the acreage of the site.

Geology and Soils

- Geology and soil characteristics of the site, including but not limited to:
  - A description of the soil types and their distribution in the study area;
  - An assessment of the geotechnical capability of the site to support the level of infrastructure and development;
  - Depth at which the water table lies (and the extent of ground water);
  - Soil/substratum shear strength and compressibility
  - Vulnerability to the different types of land slippage and/or subsidence;

  Suitable soil-boring and test pit surveys should be conducted on-site to gather this information.
  - Structural geology and seismology of the area should be determined and related to the compatibility of the proposed use and site preparation activities

- Hydrogeology and groundwater resources – describe the existing groundwater regime in the local study area and identify the existence and type of aquifers in the local study area:

Biological environment

- Flora - map and describe the existing terrestrial vegetation, including an inventory;

- Fauna and Aquatic Fauna of site (inclusive of the LNG River) and their use of the surrounding environments – document and describe general species variance and species of conservation concern (if any) found within the study area;

- Identification and description of species of commercial importance in the study area;

- Identification of sensitive species in the study area (if applicable);

Aquatic Environment

- Surface Hydrology and Drainage – map and discuss the existing drainage patterns /characteristics of the study area site including any known drainage networks (natural or man made);
- Water quality – Assess the baseline water quality of the nearby watercourses (e.g. LNG River) for a period representative of one complete annual cycle (approximately 12 consecutive months). Parameters to be analysed include, but are not limited to: Temperature, pH, Biological Oxygen Demand and chloride (Cl^-).

2.3.2 Socio-economic environment

- Provide information on the baseline socio-economic conditions of the project, including, but not limited to the following:

  - The demographic profile of the population, located in the study area, with particular reference to groups/individuals whose livelihood may be affected by the proposed development;
  - Information on the economic status of the area;
  - Employment and labour market – indicate opportunities for employment generation and the availability of such employment both locally and within the nearby communities;

- Identification of occupants of parcels located in the project area subject to relocation/resettlement using cadastral information as related to the proposed project;

- Information about the existing and planned activities in the EIA Study Area, - indicate the nature, size, location and duration of their potential interactions with the environment, (e.g. land disturbance, discharges of pollutants, changes to access status, etc.);

- Identify resource users (inclusive of traditional users) in the locality of the site ranging from subsistence use to that of a commercial scale;

- Existing and planned civil infrastructure/amenities;

- Existing land use in the study area inclusive of the industrial environment in the study area;

- Aesthetic and recreational value of the area;

- Archaeological, cultural and historic value of the area (if applicable).

2.4 Legislative and Regulatory Considerations

Describe the relevant local regulations, standards and guidelines governing environmental quality, health and safety that would apply to the proposed project. Some of these are identified in Section 1.3 above and should be expanded as appropriate. Consideration should also be given to draft legislation laid in parliament and to proposed legislation to be developed under the Environmental Management Act namely:

- Draft Air Pollution Rules (2005)
- Draft Solid and Hazardous Waste Management Rules

Other agencies would be involved in various approval processes applicable to this project. The approvals that are required should be outlined. Some of these agencies include:

- Environmental Management Authority, Ministry of Pubic Utilities and the Environment
- Town and Country Planning Division, Ministry of Planning and Development
- Couva/Tabaquite/Talparo Regional Corporation
- Ministry of Energy and Energy Industries

- Ministry of Labour and Small and Micro Enterprise Development (Occupational Health and Safety Unit)
- Ministry of Works and Transport (Drainage Division)
- Ministry of Energy and Energy Industries
- Water and Sewerage Authority (WASA)
- Water Resources Agency (WRA)
- Trinidad and Tobago Civil Aviation Authority.

2.5 Determination of the Potential Impacts of the Proposed Project

Identify all impacts that could arise during the site preparation, construction and operation and of the facility as a whole. Distinguish (where applicable) between negative and positive impacts, direct and indirect impacts, immediate, short-term, long-term impacts and cumulative impacts. Assess the cumulative environmental effects that are likely to result from the proposed facility in combination with other existing, approved and proposed projects in the region that could reasonably be expected to have a combined or cumulative effect. Include other existing and proposed industrial projects as well as activities associated with land use and infrastructure. Also describe impacts quantitatively as far as possible and consider those that can occur under upset conditions. Impacts should be categorised and illustrated in matrix form. Areas of impacts/hazards should be illustrated in map form and those that are unavoidable or irreversible must be specifically identified. Significant changes to baseline conditions should be quantified.

The potential impacts to be determined shall include, but are not limited to those on:

- Release of chlorine, including, but not limited to, such aspects as:

  - Dispersion modelling for chlorine exposure beyond the property line of the plant, provided;
  - A full description of the model(s) used shall be given (i.e. validation, calibration and limitations of the model) and the sensitivity of such model(s) to variations in the input parameters must be stated;
  - The dispersion modelling must be based on the resident meteorological conditions (e.g. wind speed humidity) of the proposed site considering a number of variations in operating and climatic/atmospheric conditions (inclusive of upset conditions) to extrapolate ground level pollutant concentrations;
  - Details should be provided on the chlorine emissions profile (type, rate, concentration and source) for the facility including point and area sources;

- Models should furnish 1 hour and 24-hour averages for ground level pollutant concentrations;
- The results of the modelling should be evaluated with respect to the relevant standards with particular respect to those included in the Draft Air Pollution Rules;
- The impact shall be analysed in terms of possible impacts on ecosystems and human health in the area;

Emissions shall be modelled to estimate the extent of dispersion under a number of variations in operating and climatic/atmospheric conditions to extrapolate breathing zone pollutant concentrations. Models should furnish averaging times as specified in comparison to relevant standards for ground level pollutant concentrations. Models shall utilise validated data sets pertaining to local climatic conditions (e.g. wind speed, humidity etc.) that span a minimum of 12 consecutive months. A full description of the models to be used shall be given (i.e. validation, calibration and limitations of the model) and the sensitivity of such models to variations in the input parameters must be stated. The EIA shall assess a comprehensive set of expected contaminants (including but not limited to, Chlorine, VOCs, SO_2, NO_x, CO etc.) to be emitted with regard to emission rate and concentration/temperature at exit, as well as stack height and diameter. The impacts of each pollutant shall be defined in relation to atmospheric effects over the long and short term.

The EIA is expected to conduct modelling of the plant's expected emissions. Further, the EIA is expected to conduct modelling of the cumulative effects that may result from emissions from the proposed plant.

- Dust – the generation and movement of dust offsite during the site preparation, construction and operational phases (such as dust from the storage of limestone on site) of the project;

- Release of chlorine, including, but not limited to, such aspects as:

  - Screening modelling for chlorine exposure beyond the property line of the plant.
  - Modelling should be used to understand the spatial distribution of direction and dispersion of air pollutants under a number of variations in operating and climatic/atmospheric conditions to extrapolate ground level pollutant concentrations
  - Models should furnish 1hour and 24hour averages for ground level pollutant concentrations.
  - A full description of the model(s) used shall be given (i.e. validation, calibration and limitations of the model) and the sensitivity of such model(s) to variations in the input parameters must be stated;

- The impact shall be analysed in terms of possible impacts on hydrology and ecosystems in the area;

- Water quality – including, but not limited to, such aspects as:
  - The impact of any discharge during construction, start-up, normal, worst-case conditions and emergency on the ambient water quality at the discharge point; the cumulative impacts of continuous/long term discharge at the proposed site outfall point(s) of the project site;
  - Impact on the water requirements during worst-case conditions and emergency operating conditions as well as decommissioning; discuss the availability and source of water in the event of these occurrences;
  - Impacts on ambient conditions of any discharge during construction, start-up, normal, worst-case conditions, emergency and decommissioning;
  - Effect of site run-off on surface water quality (LNG River); effect of contaminant spills on water quality;
  - Possibility of groundwater contamination;

- Drainage – an assessment of the impacts of any anticipated change to drainage patterns which could affect nearby communities and residents;

- Solid waste – identify the activities of all phases of the project that may produce both hazardous and non-hazardous solid waste, and assess the possible impacts associated with the type of waste produced;

- Flora and fauna including, but not limited to, such aspects as:
  - Impacts on aquatic ecology;

- Soil – identify any activities associated with the construction and operation of the Chlor-Alkali plant and associated infrastructure that may result in contamination or soil deterioration;

- Human beings – including, but not limited to, such aspects as:
  - The potential health implications of the products that will be released to the environment (e.g. chlorine, that CariSal proposes as a temporary by-product of the process) from the proposed operations in relation to exposure limits established for acute or chronic adverse effects on human health and safety;
  - The cumulative health effects that are likely to result from the project in combination with other existing, approved, and proposed projects (projects that have been advanced to the public disclosure stage);

- The potential health and safety impacts due to land-based traffic volumes during site preparation, construction and operational phases of the project as well as the increased risk of accidental leaks and spills;
- Social impact as it relates to: local employment and training, local procurement, demands on local services and utilities;
- Disruption of traditional access routes and uses of the area during site preparation, construction and operational phases of the project such as agriculture, fishing, recreation, community facilities and institutions;
- Increase in dust or odour;
- The introduction of increased dangers (fire, explosion, spills, gas releases, chemical and other hazardous substances) and the impact of the increase on existing services and facilities to the community;
- The documentation of health, safety and environmental concerns raised by stakeholders during the consultation on the project; transcripts of public meetings and meeting minutes shall be included;
- Identify and discuss the data and methods used to assess the impacts of the project on human health and safety;

- Noise – estimate the potential for increased noise resulting from the construction and operation of the facility; identify potentially affected people and the implications of any increased noise;

- Nearby industries and other sustainable economic activity;

- Infrastructure, services and utilities, social services, resource usage and impacts on overall availability to other users of the area;

- Public access to roads and traffic movements; increased traffic, delays in travel times for residents, etc.

- Access and use of existing and proposed areas of archaeological, cultural and/or historic value;

2.5.1 Assessment of Risk

The assessment of risk for the proposed activity is subjected to the legal compliance requirements of 13 (A) of the OSH Act 1 of 2004. Section 8 of part II of the Act requires that the findings of the risk assessment be used in the formulation of an Emergency Response Plan (ERP) that is site and location specific for all phases of the proposed project.

A suitable and sufficient assessment of the risk to the health and safety of employees (individuals) and the public must be conducted for all phases of the proposed activities. The terms suitable and sufficient implies the following:

- A decision framework should be used in the selection of an appropriate risk assessment methodology(ies) for estimating the health and safety risk to employees, contractors and the public;

- A description of the assessment methodologies used for estimating risk for all phases of the proposed activity. The risk assessment methodology applied should be of sufficient detail to enable the ranking of risks in order, for subsequent consideration of risk reduction. The rigour of assessment should be proportionate to the complexity of the activity and the magnitude of risk;

- Identify significant hazards associated with the proposed activity, and estimate the risks if significant hazards were to take effect. The output of the risk estimation should be a list of risks in ranked order for consideration;

- Identify any group of employees who are especially at risk;

- Identify others who may be especially at risk e.g. visitors, contractors, members of the public;

- Identify appropriate risk control for hazards that pose a significant risk based on established risk criteria using the "as low as is reasonably practicable" (ALARP) principle. The findings of the risk assessment should be used to identify and prioritise risk management strategies that include prevention, control, protection and mitigation of risks to the ALARP principles. The reasoning for or against the choice of particular risk reduction measures to be implemented should be clear, and take into account residual risk;

- The findings of the risk assessment should be used in the development and implementation of emergency response planning. This is subjected to the legal compliance requirements of section 8 of the OSH Act 1 of 2004.

The risk assessment should be carried out to assess and quantify the risk of occurrence of significant hazards inclusive of, but not limited to, the following:

- Chemical usage, generation, storage and transport;
- Operating conditions;

- Natural gas feed line, release from major leak or rupture;
- Major leaks or ruptures to product lines (e.g. chorine, caustic soda, hydrochloric acid)
- Storage tank failures
- Equipment/piping failure due to corrosion and wear;
- Explosion hazard due to the formation of an explosive gas mixture and the potential of this to generate extensive offsite risk (individual and societal risk must be evaluated);
- Flash fires, pool fires and liquid spray fires;
- Instantaneous release of any gas of a toxic or persistent nature.

The Risk Assessment studies should also inform/advise the applicant on the formulation of the Health and Safety Management and Emergency Response Plan (ERP) and the additional measures that can be taken to assist in managing safety, such as the establishment of adequate buffer zones and the establishment of safe rooms.

Describe the plans to respond to such emergencies as well as all incidents and accidents. A conceptual ERP should discuss, but not be limited to such aspects as:

- Access/egress routes, safe shelter locations, emergency training for nearby communities, provisions for temporary displacement, responsible persons, emergency medical care, etc;

- Outline the components and structure of the emergency response team, defining their qualifications and roles as emergency response team members;

- The conceptual ERP should also include provisions for other related risks such as fires, cooling tower drift and floods;

- Describe how local residents will be contacted during an emergency and what type of information will be communicated to them;

- Describe the plan to have proposed agreements with regional corporations, fire services, co-operatives, emergency response associations or industry groups, to help deal with emergencies or adverse situations;

Dispersion modelling studies should be used to determine predicted direction and dispersion of air emissions and noise where applicable. Dispersion modelling, where applicable, should be carried out to understand the spatial distribution of risks to employees and the public onsite and offsite. The findings of

dispersion modelling studies should be used as an input when estimating individual and societal risk and, in particular, the risks associated with exposure to the emissions from the project. The source, type and reason for the particular model(s) chosen must be clearly referenced and stated.

Other hazards to be considered shall include, but not be limited to:

- Earthquakes and related events
- Storms and floods
- Climate change/sea level rise
- Terrorist Activities/ Sabotage

2.6 Analysis of Alternatives to proposed project

Describe reasonable alternatives that were examined to achieve the same objectives. This extends to plant location, design of manufacturing operations and choice of technology, optimisation techniques and operation and maintenance procedures. Compare the alternatives in terms of potential environmental impacts and costs, suitability under local conditions and reasons for selecting the chosen alternative. The **'no action'** alternative should also be considered to demonstrate potential changes in environmental baseline conditions without the project. Alternatives to be considered should include, but not be limited to:

- Siting – possible alternative locations for this activity;
- Design, including facility layout, intensity of development;
- Construction techniques and phasing;
- Operation and maintenance procedures;
- Process technology options in terms of use of best available technology;
- Supply options for water in terms of on-site storage, groundwater, etc.
- Options for wastewater and solid waste treatment and management strategies, and reasons for selecting the proposed option;
- Process selection in terms of best practicable environmental option;

2.7 Development of an Environmental Management Plan to Mitigate Negative Impacts

In consideration of any significant adverse impacts that were identified in relation to Section 2.5 above, you are required to propose realistic, feasible and cost-effective measures to avoid, reduce, mitigate or remedy such impacts to acceptable levels. These should satisfy (and show comparison with) local environmental, health and safety standards/guidelines. Where these are not available, international standards/guidelines should be used. Impacts should be

categorised and illustrated in matrix form. A management plan shall be submitted to implement the mitigation measures during the different phases of the activity.

Further to the identification of potential hazards and a determination of the level of risk, provide an account of the measures that would be implemented to address such emergencies from a health, safety and environmental perspective.

The following conceptual management plans should be developed and included:

- Sediment and erosion control measures as well as slope protection measures;

- Wastewater Management Plan to address any wastewater streams (inclusive of blow down streams) from the proposed facilities;

- Consider Hazardous Material and waste management of these materials during the construction and operational phases of the project;

- Mitigation and management plans for the protection of water quality; this plan should include water monitoring for early detection of potential contamination and assistance in remediation planning; surface water remediation options to be considered for the implementation in the event that adverse effects are detected;

- Drainage designs and mitigation of altered drainage patterns to balance the outflow of storm-water from the site to ensure no new flood patterns occur;

- Describe the monitoring programmes that will be implemented to assess air quality and the effectiveness of mitigation during the developmental and operational phases;

- Spill and air emission reporting procedures and management of the results;

- Demonstrate how the project design and voluntary Greenhouse Gas emissions (GHG) management plans will take into account the need for continuous improvement with respect to GHG emissions;

- The principles that have been incorporated into the project design for pollution prevention and waste minimisation;

- Describe the flexibility built into the plant design and layout to accommodate future modifications required by any change in emission standards, limits and guidelines;

- Monitoring plans to verify the accuracy of the modelling predictions or to determine the effectiveness of proposed mitigation plans;

- Discuss the mitigation and monitoring measures to be utilised to minimise the production of noise;

- Describe management strategies to address community and public health and safety;

- A conceptual contingency plan that considers environmental effects associated with upset conditions such as instances of zero brine flow or reduced brine flow from DESALCOTT during planned or unplanned shutdowns. The contingency plan should also address serious malfunctions or accidents at the proposed calcium chloride plant;

- Social Impact or Community Management Plans should include, but not be limited to, such aspects as provisions for communities/persons to contact and discuss concerns with the applicant arising either as a direct or indirect result of the activity;

- Should the project require the displacement of private structures and other physical assets that will be subject to displacement due to project-related works, this should be documented in the main text of the report and a summary of the agreement between the relevant parties provided as an appendix to the EIA;

2.8 Development of a Monitoring Plan

A detailed monitoring plan, based on the probable significant risks determined in the risk assessment and environmental analysis should be provided for the different phases of the project to ensure that mitigation measures achieve their objectives and where this is not so, contingency plans should be described to minimize adverse situations that may arise. Monitoring programmes should address the physical, biological and social impacts (including but not limited to those significant impacts mentioned in Section 2.5 above), and the parameters to be monitored and their respective frequencies of measurement should be stated. Include also any monitoring programs that CariSal is proposing to conduct collaboratively with other stakeholders. Include in this program a description of the role and responsibilities that CariSal would be taking in each of these programs.

Devise mechanisms for sharing results, reviewing findings and adjusting programs, should monitoring identify unanticipated consequences of CariSal's operations or mitigation plans, including:

- Corporate adaptive management strategies
- Consultation with regulators, public stakeholders, and, if necessary, relevant management forums.

2.9 Stakeholder Consultation and Participation

Consultation and public participation can assist in the identification and mitigation of impacts while preventing environmentally unacceptable development, controversy, confrontation and delay.

The stakeholders that can assist in the provision of information relevant to the project should be determined and their input sought into its feasibility as it relates to the impact assessment process. These stakeholders would include, but are not limited to, the following:

- Government Ministries/Departments/Statutory Authorities:
  - Ministry of Planning and Development, Town and Country Planning Division
  - Ministry of Energy and Energy Industries
  - Ministry of Works and Transport, Drainage Division
  - Ministry of Public Utilities and the Environment, Water and Sewerage Authority
  - Ministry of Labour and Small and Micro Enterprise Development
  - Office of Disaster Management and Preparedness (ODPM)
  - Couva/Tabaquite/Talparo Regional Corporation
  - Archaeological Committee (if applicable)
  - Environmental Management Authority
- People living in the vicinity of the project that can be affected by the project;
- Environmental and other non-governmental organizations;
- Environmental experts;
- Other industries and business interests in the vicinity of the project that can be affected by the project.

There should be mechanisms to provide meaningful information to these stakeholders and to allow proper consultation and participation. The public consultation should be geared towards the understanding of the general public on the nature of the project, time frame involved and all relevant issues.

A minimum of two public consultations must be held with the determined stakeholders at a time and day of the week appropriate for the community given consideration for religious observances and public holidays. All relevant information, including description of activities, all associated impacts and mitigation measures should be presented at the initial consultation. These consultations should allow the stakeholders time for assessment of the information presented. Their concerns will be largely related to the impacts that the project is likely to have on their lives. Information should be graphic, concise, clear and designed in a manner to elicit participation.

NB. All public consultations should be scheduled to include one meeting prior to the completion of the environmental study and one meeting after the environmental study has been completed by the representative of the proponent, and the findings of the study, such as the impacts and mitigation measures, have been made available to the proponent.

Public involvement in the process should be accessible, transparent, accountable, flexible and provide for certainty and should be conducted with integrity. A tabular format is a recommended way of summarizing the results of this process. The table is not to replace specific reference to public involvement throughout the impact assessment report. Rather with specific cross-reference to page numbers or section numbers of the report, the table becomes a useful reference tool.

3. The EIA Report

The EIA Report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and analysed and citations for any references used in their interpretation. Present detailed and un-interpreted data as well as unpublished documents in an appendix. Methodologies for all data collection and analyses (including quality control measures) should be included in the appendix.

A suggested format is outlined below.

- Table of Contents
- Non-Technical Summary – the aim of the non- technical summary is to provide a short project description, a listing of key impacts, strategies to be employed to mitigate and manage the impacts and performance indicators
- Introduction

- Legislative and Regulatory Framework
- Description of the Proposed Project
- Description of the Environment
- Significant Environmental Impacts
- Analysis of Alternatives
- Mitigation Management Plan
- Monitoring Plan
- Emergency Response Plan (ERP)
- Inter-Agency and Public/NGO Involvement
- List of References
- Appendices
  - Application Form and Terms of Reference;
  - List of individuals having prepared the Environmental Assessment Report and their qualifications;
  - Records of Inter-Agency and Public/NGO Communications;
  - Methodologies, Data and Unpublished Documents.

Note: All pages are to be numbered

4. Other information

Environmental assessment requires interdisciplinary analysis. Experts in their relevant fields should interpret information obtained and where necessary, appropriate references and technical/scientific analyses should be provided to support such interpretations. This should also apply to social issues, especially when dealing with sensitive matters. Some experts that should be utilized during the conduct of this EIA include but are not limited to such disciplines as process, mechanical, civil and environmental engineers, planners, social or natural scientists, community relations experts, risk assessment experts with experience in the petrochemical industry, air modelling experts, process water modelling, etc. The project manager should have experience in preparing several similar environmental assessments, management skills and sufficiently broad training and/or experience to be able to provide overall guidance and to integrate findings of the individual disciplines.

The applicant may assert a claim that information provided in support of the EIA is a trade secret or confidential business information. Such information, if any, should be excluded from the EIA Report and submitted under separate cover to the EMA. The EMA will then determine the validity of this claim and where this is rejected in accordance with rule 3(8) of the CEC Rules, 2001, the applicant shall be notified accordingly.

Under Section 35(5) of the EM Act any application which requires the preparation of an environmental impact assessment shall be submitted for public comment in accordance with Section 28. Section 28(3) stipulates a period of not less than thirty days to receive public comments and this Report would be made available for such comments as part of an administrative record.

In order to aid the review process the following information should be submitted to the EMA:

- Twenty five copies of the EIA report;
- Three (3) digital copies of the EIA report in pdf format and the Executive Summary in MS Word. Each chapter of the EIA Report and each appendix must be individual PDF files; and
- All spatial and mapped data required must be provided digitally in a GIS format compatible with ArcView;

These will be copied and used for the public comment process as well as being available to other departments/agencies that would have a critical role in the evaluation of the report.

Dated this ....16th.... day of ....August....., 2007

Dave McIntosh
Managing Director/CEO
Environmental Management Authority

Appendix 1: Guidelines for the Hosting of Public Consultation Meetings

NB. All public consultation exercises should be scheduled to include one meeting prior to the completion of the environmental study and one meeting after the environmental study has been completed by the representative of the proponent.

Location

- The public consultation meetings shall be hosted at a location that is easily accessible to the communities that can be directly affected by the project, with the capacity for at least one hundred attendees. Meetings shall be held at a time that is best suitable for maximising attendance.

Advertising

- The public meetings shall be advertised in at least one daily newspaper at least one week from the date of the meeting. The advertisement should occupy at least one quarter of a page in the newspaper and should be bold and noticeable.

- Flyers of at least 8 ½" by 11" in size should be placed at popular stops within the communities such as gas stations, supermarkets, banks and drugstores, or within daily newspapers circulated within the communities (this service can be accessed via the newspaper houses). Fonts on the flyers shall be bold and noticeable.

- Letters or other measures of communication to those stakeholders who may not reside in the affected communities.

- Other means of advertising may be used, such as radio and television announcements, announcements in community organisations such as community centres, churches, etc.

Invitees

- The proponent shall extend official invitations to the following Officials:

  - The Member/s of Parliament/ Elected Representative for the Area/s
  - The Mayor or other representative/s of the relevant Regional Corporation/s
  - Representative/s of the Environmental Management Authority and other relevant Government Authorities
  - Community Leader/s

- The proponent may choose to invite members of various non-governmental organisations including those who may provide supporting reasons for the Certification of the proposed project;
- Members of the media may be invited
- Any other invitees

Meeting Format

- The Proponent or representatives of the proponent shall inform attendees of who they are and the purpose of the meeting, specifically that a Certificate of Environmental Clearance is being sought from the EMA to proceed with the project;

- The Proponent or representatives of the proponent shall give a clear and concise synopsis of the findings of the proposed project and the Environmental Impact Assessment including:

  - The precise location of the project;
  - The activities to be undertaken by the Proponent;
  - All logistics associated with the activities, including use of resources, infrastructure, scheduling and duration of activities;
  - All possible impacts associated with the project;
  - All mitigation measures proposed;

- The floor shall be opened for comments by attendees. (Comments may be managed in the interest of time and in an effort to extract the salient points);

- A transcript of these meetings shall be prepared and included in an Appendix of the EIA. Salient comments from the meetings shall be noted and submitted in an appendix of the Environmental Impact Assessment Document. The EIA Report should also contain details on the manner in which the public was notified, the groups targeted, the number of meetings held, location of meetings, days held, minutes of all meetings and results of public surveys.

  The information gathered should be representative of the stakeholders and should address the concerns raised during the consultation process. The EIA report should demonstrate that public concerns have been adequately considered by suggesting possible modifications to the project proposal or by clarification of items within the document. This should be appropriately documented and included in the EIA Report. The EIA report should also contain details on:

- The manner in which the public was notified, the groups targeted, the number of meetings held, location of the meetings, days held, minutes of all meetings and results of the public surveys;

- The type of information provided during the consultations and the issues discussed, differentiating between those which have been resolved and any outstanding issues;

- The key alternatives which have been identified by CariSal Trinidad Limited and stakeholders in the consideration of resolved issues;

- Any plans for ongoing consultations.

APPENDIX B
LIST OF PREPARERS

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CARISAL UNLIMITED	
Name	Academic Qualifications
Richard Lietzau Professional affiliations: Chemical Manufacturers Association – Process Control Board Chemical Manufacturers Association – Engineering and Construction Board American Institute of Chemical Engineers – Engineering, Construction & Contracts Board of Directors CII Task Group contributor Nominated for the National Academy of Constructors - 2004	B.Sc., Chemical Engineering
James Shepard	B.Sc., Chemistry
Roger Moore	B.Sc., Mechanical Engineering; Registered Professional Engineer

CONTRACTORS

DaCosta Gwendoline – The Environmental Solutions Company Limited and its subcontractors were responsible for supporting CariSal Unlimited in conducting its environmental analysis and in the preparation of the EIA.

DaCosta Gwendoline – The Environmental Solutions Company Limited	
Name, Contribution	Academic Qualifications
Karen Ann DeGannes, Principal Overall EIA Project Management Environmental Design Review/Management Regulatory Relations/Compliance QAQC	Ph.D. Candidate, Natural Resources & Environment and Organizational Sociology; M.S. Natural Resources; B.Sc. (Honours), Urban and Regional Planning
Mina Yoo Socioeconomic Environment	Dual Ph.D., Sociology & Business Administration; B.A., Sociology

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APPENDIX C
QUANTITATIVE RISK ASSESSMENT

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QUANTITATIVE RISK ASSESSMENT

Proposed CariSal Unlimited Chlor-alkali Facility and Associated Infrastructure, Point Lisas, Trinidad and Tobago, West Indies

Prepared for:

CariSal Unlimited

Submitted to:

Environmental Management Authority

Prepared by:

ICF International with DaCosta Gwendoline, Ltd. and Remote Data Concepts Caribbean Limited

Quantitative Risk Assessment (QRA)

This appendix to the Environmental Impact Assessment (EIA) is designed to identify risk of many types associated with the Carisal Unlimited project to construct a chlor alkali plant including an adjunct calcium chloride facility. The QRA is reported in two parts reflecting two different sets of circumstances. The first part describes the risk associated with an unmitigated plant design using IDLH values to assign risk. This study is found on pages C-5 - C-356 of Appendix C and Attachments 1, 2, 3. The second part of the risk assessment, Addendum to the Quantitative Risk Assessment, is included as Attachment 4. This second assessment was conducted after submittal of the EIA to the EMA and their subsequent review. In response to EMA's concerns, the Addendum to the QRA was authored using an updated plant design including numerous mitigations to the process. This overall mitigation of risk is described in a LOPA study (included) conducted following a second HAZOP study. The Addendum employs threshold exposure values higher than the IDLH values used in the initial QRA. The IDLH values used were collectively judged overly conservative. The Addendum uses literature supported threshold exposure values that correspond to a probability that 10% of the exposed population would experience fatality. The amount of any released chemical was also reduced from the first submittal due to the inclusion of engineered systems in the plant design that react within the process to mitigate any environmental release in amount and duration.

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EXECUTIVE SUMMARY

PROPOSED PROJECT

CariSal Unlimited (CariSal) proposes to construct a chlor-alkali plant adjacent to the existing Point Lisas South and East Industrial Estate (PLSEIE) for the production of calcium chloride, caustic soda, sodium hypochlorite and hydrochloric acid with high quality industrial water as a byproduct.

OBJECTIVES OF QUANTITATIVE RISK ASSESSMENT

This Appendix to the Environmental Impact Assessment for the proposed CariSal Unlimited chlor-alkali plant documents the methodology and findings of a quantitative risk assessment (QRA) whose scope of work and objectives are to:

- Assess, quantify, and depict risks associated with construction and operation of the proposed chlor-alkali plant, ex-situ facilities, and raw material and product transportation operations;
- Address potential construction and operation hazards of the proposed project including:
  - Fires,
  - Explosions,
  - [Ex-situ] Pipeline Leaks
  - Process Upset Conditions
  - Process Vent Releases
  - Process Piping Leaks
  - Vessel Failures, and
  - Natural Hazards.
- Assess the effects on the environment of identified hazards;
- Assess the ability of the community to respond to identified hazards;
- Quantify projected individual risk and societal risk associated with identified hazards Assess the ability of the community to respond to identified hazards; and
- Thereby help CariSal meet its obligations under the 2004 Trinidad and Tobago Occupational Health and Safety Act.

QRA METHODOLOGY

The QRA methodology was developed following risk assessment methodologies used in EIAs prepared for existing and proposed facilities in the vicinity of the CariSal site, as well as recommendations provided in the TOR and the U.S. Environmental Protection Agency (EPA) Guidelines on Air Quality Models (GAQM), Appendix W to 40 US Code of Federal Regulations Part 51. Public health impacts associated with hazardous material release accident scenarios have been evaluated relative to the Trinidad and Tobago air quality permissible levels as

documented in the draft Trinidad and Tobago Air Pollution Rules (2005) and relative to other relevant short-term exposure guidelines. The methodology was applied to assess the frequency and potential consequences of accidents during facility operations over the proposed 20-year life span of the facility. It considers individual risk and societal risk for the identified accident scenarios. Individual risk is defined as the numerical probability that an individual would experience a particular adverse effect, for example, exposure to chlorine gas at a concentration in excess of established exposure standards, as a result of an accident. Societal risk evaluates the individual risk in the context of the size of the exposed population.

Hazard Identification and Accident Scenarios

CariSal prepared a Process Hazard and Environmental Risks Identification (HAZID) for the proposed chlor-alkali plant as part of the front-end engineering design for the proposed project (Conve & AVS Inc. 2007). The HAZID identified and evaluated material and activity hazards related to the proposed onsite operations of the chlor-alkali facility. Material hazards are those related to the intrinsic properties of materials (e.g., chlorine). Activity hazards are those related to activities conducted during operation of the facility. The HAZID does not evaluate hazards associated with ex-situ facilities or offsite activities, for example, raw material and product transportation or hazards associated with construction activities.

Accident scenarios for the proposed chlor-alkali plant were identified based on reviews of the hazard identification (HAZID) and process flow diagrams and on considerations of the proposed process design and operation.

Likelihood Ratings of Accident Scenarios

Accident scenarios identified in the QRA have been assigned a likelihood (probability) category rating in accordance with the definitions described in the HAZID. The likelihood (probability) definitions consider the frequency of the event, historical industry experience, and the layers of design and operational protections designed to prevent the event from occurring. Table ES-1 describes the definitions for the five likelihood (probability) categories. The likelihood ratings for accident scenarios in the HAZID do not incorporate redundancies designed into the CariSal facility process, and therefore these likelihood ratings for the accident scenarios have only been used for the preliminary risk ranking for the selection of accident scenarios for further analysis in this QRA. Accident scenario probabilities for the purposes of individual and societal risk assessment are based on the CariSal process design including redundancies designed into the CariSal facility process.

Table ES-1. Likelihood (Probability) Definitions

LEVEL	LIKELIHOOD (PROBABILITY) DEFINITIONS
1	*Categories*
a.	Frequency: 0.0 to 1 x 10^{-6} (never to 1 in 1,000,000 years)
b.	Hazard Scenario: Should not occur in the life of the process and there is no historical industry experience to suggest it will occur.
c.	Layers of Protection: Procedures or operator interface relied upon to prevent unwanted events
2	*Categories*
a.	Frequency: 1 x 10^{-6} to 1 x 10^{-4} (1 in 1,000,000 years to 1 in 10,000 years)
b.	Hazard Scenario: Similar events are unlikely to occur, but have historically occurred in this type of process somewhere within the industry.
c.	Layers of Protection: Single layer of safeguard and operator interface are in place to prevent unwanted events.
3	*Categories*
a.	Frequency: 1 x 10^{-4} to 1 x 10^{-3} (1 in 10,000 years to 1 in 1,000 years)
b.	Hazard Scenario: This particular scenario is likely to occur somewhere in the industry during the life of this general type of process.
c.	Layers of Protection: Two independent highly reliable safeguards are in place; failure of one safeguard would not initiate an unwanted event.
4	*Categories*
a.	Frequency: 1 x 10^{-3} to 1 x 10^{-2} (1 in 1,000 years to 1 in 100 years)
b.	Hazard Scenario: This particular scenario is almost certain to occur somewhere in the industry during the life of this specific type of process (but not necessarily at this location).
c.	Layers of Protection: Three independent highly reliable safeguards are in place; failure of two safeguards would not initiate an unwanted event.
5	*Categories*
a.	Frequency: 1.0 x 1 to 10^{-2} (always to 1 in 100 years)
b.	Hazard Scenario: This particular scenario has occurred somewhere in the industry in this specific process or is likely to occur at this location during the life of this facility.
c.	Layers of Protection: Four or more independent highly reliable safeguards are in place; failure of three safeguards would not initiate an unwanted event.

Reference: Conve & AVS Inc. 2007, Page 8

CONSEQUENCE RATINGS OF ACCIDENT SCENARIOS

Accident scenarios identified in the QRA have been assigned a severity (consequence) category rating in accordance with the definitions described in the HAZID. The severity (consequence) rating definitions consider the potential for onsite injuries, onsite property damage, environmental impact, loss of production, and offsite environmental, health, and safety impacts. Table ES-2 describes the definitions for the five severity (consequence) rating categories. The consequence ratings for accident scenarios in the HAZID do not incorporate redundancies designed into the CariSal facility process, and therefore these consequence ratings for the accident scenarios have only been used for the preliminary risk ranking for the selection of accident scenarios for further analysis in this QRA. Accident scenario consequences for the purposes of individual and societal risk assessment are based on the CariSal process design including redundancies designed into the CariSal facility process.

Table ES-2. Severity (Consequence) Definitions

LEVEL	SEVERITY (CONSEQUENCE) DEFINITION
1	*Categories*
a.	Minor onsite injuries (first aid and non-disabling, reportable injuries).
b.	Property damage less than base level amount.*
c.	Minor environmental impact (no remediation).
d.	Loss of production less than base level amount.*
e.	No offsite impact or damage.
2	*Categories*
a.	Serious onsite injuries (temporary disabling worker injuries).
b.	Property damage 1 to 20 times base level.
c.	Moderate environmental impact (cleanup or remediation in less than one week and no lasting impact on food chain, terrestrial life, or aquatic life).
d.	Loss of production from 1 to 20 times base level.
e.	Minor offsite impact (public nuisance – noise, smoke, odour, traffic).
f.	Potential adverse public reaction.
3	*Categories*
a.	Permanent disabling onsite injuries or possible fatality.
b.	Property damage 20 to 50 times base level.
c.	Significant environmental impact (cleanup or remediation in less than one month and minor impact on food chain, terrestrial life, or aquatic life).
d.	Loss of production from 20 to 50 times base level.
e.	Moderate offsite impact limited to property damage, minor health effects to the public or first aid injuries.
f.	Adverse public reaction.
4	*Categories*
a.	Onsite facility or less than 4 permanent disabling worker injuries.
b.	Property damage 50 to 200 times base level.
c.	Serious environmental impact (cleanup or remediation requires three to six months and moderate impact on food chain, terrestrial life and/or aquatic life).
d.	Loss of production from 50 to 200 times base level.
e.	Significant offsite impact property damage, short-term health effects to the public or temporary disabling injuries.
f.	Significant public concern or reaction.
5	*Categories*
a.	Multiple onsite fatalities or 4 or more permanent disabling onsite injuries.
b.	Property damage greater than 200 times base level.
c.	Extensive environmental impact (cleanup or remediation exceeding six months, significant loss of terrestrial life or aquatic life or damage to food chain uncertain).
d.	Loss of production greater than 200 times base level.
e.	Severe offsite impact property damage, offsite fatality, long term health effect or disabling injuries.
f.	Severe adverse public reaction threatening facility continued operations.

Reference: Conve & AVS Inc. 2007, Pages 9 and 10

RISK RATINGS OF ACCIDENT SCENARIOS

Accident scenarios were assigned an initial risk rating by applying the likelihood (probability) and severity (consequences) ratings to the risk matrix and then applying the risk definitions

described in the HAZID. The risk matrix is shown in Table ES-3, and the risk definitions are shown in Table ES-4.

Table ES-3. Risk Matrix (R = P x C)

Probability		Consequence				
		1	2	3	4	5
	5	C	C	D	E	E
	4	B	C	C	D	E
	3	B	B	C	D	D
	2	A	B	C	C	D
	1	A	A	B	C	D

Table ES-4. Risk Definition

A.	No further action or safety study is required. Individual personnel judgment required for operation to occur.
B.	Document process safety studies, hazard and risk reducing measures. Consider feasibility and cost benefit of additional risk reducing measures. Supervisor approval is required for operation.
C.	Document process safety studies; evaluate feasibility of additional risk reducing features and implement if worker exposure can be reduced to a lower level. Operating Group approval is required for operation.
D.	Document process safety studies, hazards, and risk reducing measures. Identify additional risk reducing measures and implement if work exposure can be reduced to a lower level. Divisional management approval is required for operations.
E.	Additional process safety studies and risk reducing measures are mandatory to achieve lower risk. Corporate senior management approval required for operations.

Reference: Conve & AVS Inc. 2007, Page 10 of 29.

Accident scenarios were selected from the HAZID for further evaluation in the QRA based on the estimated frequency and consequence ratings of the scenarios and initial risk ranking. Accident scenarios associated with ex-situ facilities and offsite transportation operations also were identified and selected for further evaluation in the QRA using the same initial risk ranking criteria as used for onsite accident scenarios. The scenarios evlauated in the QRA fall into eight categories. Accident scenarios for which quantitative consequence modelling was conducted and their associated likelihood rating, and initial risk ranking were listed in Table ES-5. Accident scenarios for which offsite consequences are not anticipated and for which quantitative consequence modelling was not conducted are listed in Table ES-6 with their associated likelihood rating, severity rating, and initial risk ranking.

Approximate onsite accidental release/incident locations for the accident scenarios are depicted in the figures, as appropriate, in Section 5 of this QRA.

Table ES-5. Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
1.	*Onsite hazardous material (gaseous) release*				
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	*2*	*3*	*C*
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	*2*	*3*	*C*
1.a.3	Chlorine [outdoor] process pipe breach [seismic event]	Cl_2 release	*3*	*1*	*B*
1.b	Intermixing of Hypochlorite with HCl	Cl_2 release	*3*	*4*	*C*
2.	*Onsite hazardous material (liquid) release*				
2.a	Vessel Failure: Onsite NaOH storage tank	NaOH spill	*2*	*4*	*C*

Table ES-5. Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	2	3	C
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	*2*	*3*	*C*
3.	*Flammable gas release (dispersion)*				
3.a.1	Hydrogen [indoor] process pipe breach	H_2 release	*2*	*2*	*B*
3.a.2	Hydrogen [outdoor] process pipe breach	H_2 release	*2*	*2*	*B*
3.a.3	Hydrogen [outdoor] process pipe breach [seismic event]	H_2 release	*3*	*1*	*B*
3.b.1 3.b.2	Hydrogen vent stack release HCl scrubber stack release	H_2 release H_2 release	*2*	*3*	*C*
4.	*Flammable gas release (deflagration)*				
4.a	Onsite Natural gas deflagration	CH_4 release	3	3	C
4.b	Offsite Natural gas deflagration	CH_4 release	3	3	C
5	*Offsite [ex-situ] facility hazardous material release*				
5.a	Vessel Failure: Offsite EISL Facility caustic tank breach	NaOH spill	*3*	*3*	*C*
5.b	Offsite caustic pipeline breach	NaOH spill	*3*	*3*	*C*
6.	*Offsite transportation hazardous material release*				
6.a	Hydrochloric acid: 4,000 gallon tank truck accident	HCl spill	*3*	*3*	*C*
6.b	Hypochlorite: 4,000 gallon tank truck accident	bleach spill	*3*	*3*	*C*

Reference: Conve & AVS Inc. 2007

Note: Probability and Severity ratings for offsite transportation accidents are estimated to be similar to vessel failure scenarios for the purposes of initial risk ranking; offsite transportation accidents are not addressed in the HAZID. Based on plant design considerations, for the purposes of initial risk ranking the probability of a seismic event of sufficient magnitude to affect both chlorine process lines simultaneously is estimated to be 1, corresponding to a frequency of occurrence between zero and 1 x 10^{-6}.

[a] See Table 1.5-4 in Section 1.5-4 of this QRA for definitions of risk, B and C.

Table ES-6. Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
7.	*Onsite equipment fire and explosion scenarios*				
7.a	Natural gas leak, Steam Boiler System	CH_4 release	2	3	B
7.b	Boiler Control Failure, Steam Boiler System	Explosion	2	3	B
7.c	Natural gas leak,77% or 94% $CaCl_2$ Drying	CH_4 release	2	3	B
7.d	Reverse H_2:Cl_2 ratio in Hypochlorite Units	Explosion	1	5	C
7.e	Absorption tower deflagration, Hypochlorite Units	H_2/O_2 release	2	2	B
7.f	Membrane pin hole leak, Electrolysis Unit	Explosion	2	3	C
7.g	Hydrogen stack ignition (lightning)	Fire	1	5	C
7.h	Membrane fire	Fire	1	4	B
7.i	Transformer/Rectifier fire	Fire	3	5	D
7.j	Gasket Breach Electrolysis Module	H_2 release	1	5	C
8.k	Piping Failure, Electrolyser Unit	H_2 release	2	3	C
8.	*Onsite hazardous materials release scenarios*				
8.a	Vessel Failure, Steam Boiler System	Steam release	2	2	B
8.b	Vessel Failure, $CaCl_2$ Production	HCl spill	2	3	C
8.c	Piping Failure, $CaCl_2$ Production	HCl spill	2	3	C
8.d	Vessel Failure, Caustic Evaporation Unit	NaOH leak	2	4	C
8.e	Piping Failure, Caustic Evaporation Unit	NaOH leak	1	4	B
8.f	System Over/Under Pressure, Caustic Evaporation Unit	NaOH leak	2	2	B
8.g	Vessel Failure, Hypochlorite Units	HCl gas release	2	2	B
8.h	*Vessel Failure, Electrolysis Unit*				
8.h.1	Physical Dechlorination Vessel	Cl_2 release	2	2	B
8.h.2	Chlorate Destruction Vessel	HCl (18%) spill	2	2	B
8.h.3	Chemical Dechlorination Vessel	Alkaline brine	2	2	B

Table ES-6. Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
8.i	*Piping Failure, Electrolysis Unit*				
8.i.1	Physical Dechlorination Vessel Piping	Cl_2 release	2	2	B
8.i.2	Chlorate Destruction Vessel Piping	HCl (18%) spill	2	2	B
8.i.3	Chemical Dechlorination Vessel Piping	Alkaline brine	2	2	B
8.j	Gasket Breach Electrolysis Module	Cl_2 release	1	5	C
8.k	Piping Failure, Electrolyser Unit				
8.k.1	*Gasket Failure, Electrolyser Unit*	Cl_2 release	2	4	C
8.k.2	*Header Pipe Failure, Electrolyser Unit*	NaOH (32%) spill	2	3	C
8.l	*Piping Failure, Secondary Brine Treatment*				
8.l.1	Piping Failure, Secondary Brine Treatment	HCl (18%) spill	2	2	B
8.l.2	Piping Failure, Secondary Brine Treatment	NaOH (32%) spill	2	2	B

Reference: Conve & AVS Inc. 2007

[a] See Table 1.5-4 in Section 1.5-4 of this QRA for definitions of risk, B, C, and D.

Accident scenarios were identified for consideration in the QRA based on the hazards identified in the HAZID and based on review of process flow diagrams and consideration of the proposed process design and operation. The QRA also considers hazards associated with the design and operation of ex-situ facilities and offsite transportation operations, operations that were not evaluated in the HAZID. Accident scenarios were screened for further consideration in the QRA using the likelihood (probability) rating, severity (consequence) rating, and risk definitions described in the HAZID. The same screening criteria were applied to ex-situ and offsite operations as to onsite operations for the purposes of the accident screening analysis.

Accident scenarios for which a risk rating of "A" (the lowest risk rating in Table ES-3) was assigned based on application of the likelihood and severity ratings in Table ES-1 and Table ES-2 are not further evaluated in this QRA. Accident scenarios for which a risk rating of "B" was assigned are generally evaluated semi-quantitatively in the QRA. Quantitative consequence modelling is not generally applied to the "B" risk rated accident scenarios because these accident scenarios, for the most part, are not anticipated to result in offsite consequences. Quantitative consequence modelling is generally applied to accident scenarios for which a risk rating of "C" was assigned, primarily based on the potential for these scenarios to result in offsite consequences (e.g., potential chlorine gas release and subsequent offsite dispersion.) Only one accident scenario evaluated in the HAZID resulted in a "D" risk rating: a transformer/rectifier fire affecting the chlor-alkali plant electrical system. The basis for this rating was the high probability of occurrence and the potential for onsite consequences to the chlor-alkali facility including equipment damage and potential extended loss of plant production. Quantitative consequence modelling is not applied to this accident scenario because the scenario does not involve potential release of hazardous materials (e.g., chlorine.)

Quantitative Consequence Analysis Summary

Accidental release modelling was conducted for the risk assessment for onsite and offsite accidental release scenarios for potential releases of hazardous materials, including chlorine, hydrochloric acid, and sodium hypochlorite resulting in human exposure, and for potential releases of natural gas resulting in fire or explosion. The risk associated with each scenario was assessed based on the severity (consequences) of a release and the probability (frequency) of a

release. Quantitative consequence modelling was conducted for the scenarios listed in Table ES-7.

Table ES-7. Accident Scenarios for which Quantitative Modelling was Conducted

No.	Scenario	Type	Event Frequency
1.	*Onsite hazardous material (gaseous) release*		
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	$1x10^{-6}$
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	$1x10^{-6}$
1.a.3	Chlorine [outdoor] process pipe breach [seismic event]	Cl_2 release	$1x10^{-6}$
1.b	Intermixing of hypochlorite with HCl	Cl_2 release	$1x10^{-7}$
2.	*Onsite hazardous material (liquid) release*		
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	$1x10^{-6}$
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	$1x10^{-6}$
3.	*Flammable gas release (dispersion)*		
3.a.1	Hydrogen [indoor] process pipe breach	H_2 release	$1x10^{-6}$
3.a.2	Hydrogen [outdoor] process pipe breach	H_2 release	$1x10^{-6}$
3.a.3	Hydrogen [outdoor] process pipe breach [seismic event]	H_2 release	$1x10^{-6}$
3.b.	Hydrogen vent stack release/HCl scrubber stack release	H_2 release	$1x10^{-6}$
4.	*Flammable gas release (deflagration)*		
4.a	Onsite natural gas deflagration	CH_4 release	$1x10^{-6}$
4.b	Offsite natural gas deflagration	CH_4 release	$1x10^{-6}$
6.	*Offsite transportation hazardous material release*		
6.a	Hydrochloric acid: 4,000-gallon tank truck accident	HCl spill	$3x10^{-7}$
6.b	Hypochlorite: 4,000-gallon tank truck accident	bleach spill	$3x10^{-7}$

Reference: Conve & AVS Inc. 2007
Reference: Crowl and Louvar 2001
Reference: Craft 2004

Event frequency [probability and severity (consequences)] ratings for each onsite release event in Table ES-7 are taken from the HAZID and were used for the purposes of initial risk ranking and selection of accident scenarios for quantitative modelling. The severity and probability ratings of offsite transportation accidents (Scenarios 6.a and 6.b) were estimated to be similar to that for onsite vessel failure for the purposes of the initial risk ranking of the accident scenarios.

Event frequencies for onsite accident scenarios (Scenarios 1 through 5) shown in Table ES-7 were estimated based on CariSal facility design standards. The CariSal facility will be designed in accordance with industry design standards for chlor-alkali plants, including systems and equipment containing chlorine, process pipes, and storage vessels. These include guidelines published by the Chlorine Institute, the International Electrotechnical Commission, and other technical standards organizations.

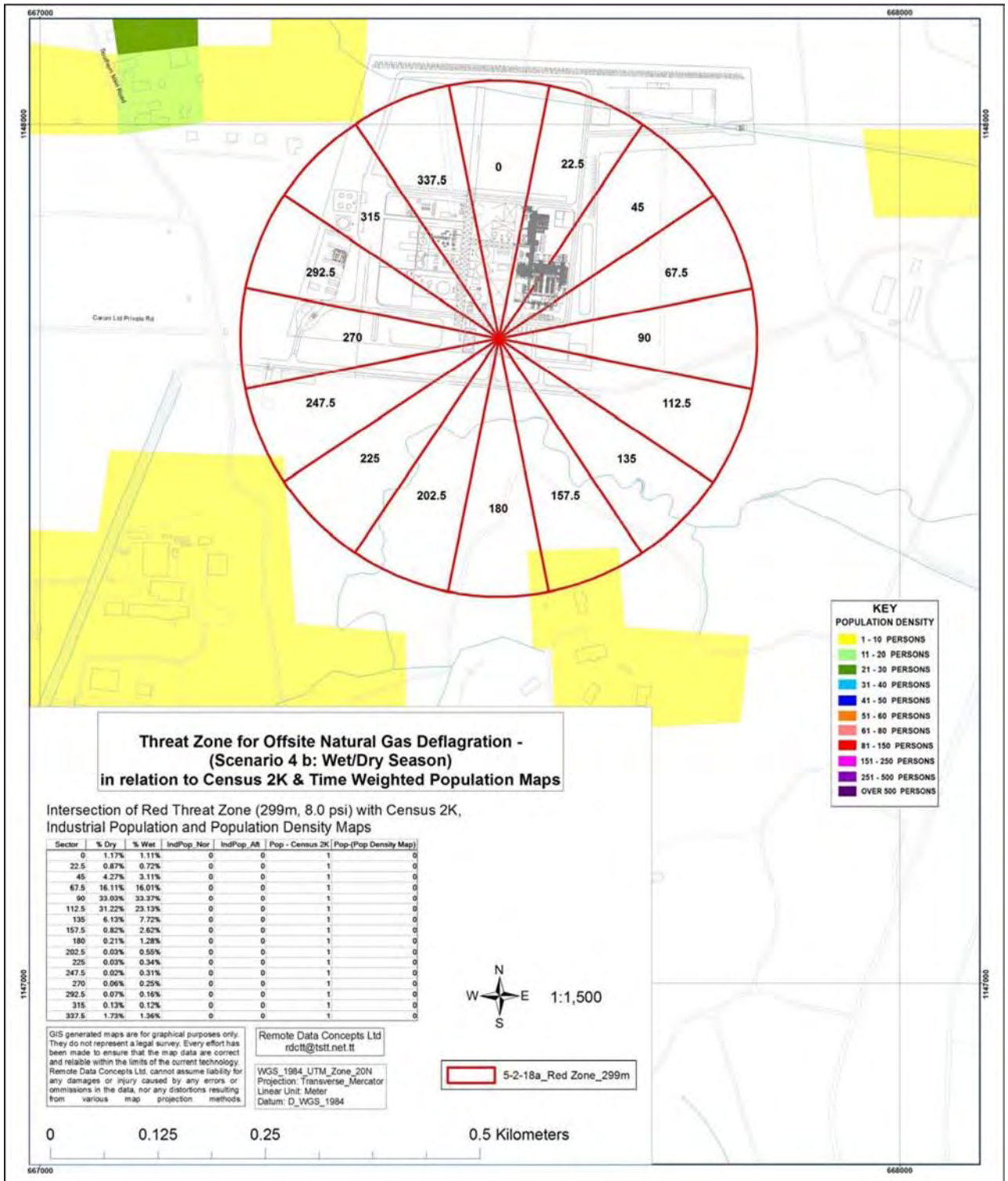
The CariSal facility design standard is to have all systems and equipment containing chlorine have a failure rate of less than 1×10^{-6}. The anticipated residual failure rate for process and storage vessels is also less than 1×10^{-6} (Crowl and Louvar 2001). The CariSal facility design of the hypochlorite and hydrochloric acid storage and product loading systems is such that inadvertent mixing of hypochlorite and hydrochloric acid is not a credible scenario. The hydrochloric acid and hypochlorite trucks would be designed with incompatible nozzles that would preclude hydrochloric acid from being loaded into hypochlorite trucks, or vice versa. Therefore for the purposes of the analysis of individual and societal risk, this scenario (Scenario 1.b) is considered to have an event frequency of 1×10^{-7}. Event frequencies of 1×10^{-6} were applied for the other onsite accidental release scenarios to estimate individual and societal risk. Event frequencies represent the probability of occurrence of the event; exposure probabilities represent the probability that an individual would be exposed to the consequences of the event (including, for example, the probability that a residence in the area of influence of the event is actually occupied at the time of the event.) Event frequencies applied to estimate individual and societal risk for each offsite release event in Table ES-7 are estimated from hazardous materials transportation data published by the U.S. Federal Motor Carrier Safety Administration (FMC SA) (Craft 2004).

Note that these event frequencies are different from and lower than those in the Process Hazard and Environmental Risks (HAZID) document because the HAZID does not account for redundancies designed into the CariSal process. Note also that the event frequency for each scenario are not equivalent to the exposure probability for the scenario, as the exposure probability also takes into account, for example, the probability that an offsite residence will actually be occupied at the time of an accidental release. The scenarios in Table ES-7 are quantitatively modelled in the risk assessment to assess the potential for impacts to the offsite population.

Modelling of onsite flammable gas releases of hydrogen and natural gas did not indicate a potential for danger to the offsite population. Modelling of offsite flammable gas releases of natural gas from the tie-in with the natural gas utility pipeline indicated a potential for explosion (Release Scenario 4.b). The modelled radius of effect of a natural gas explosion resulting from a natural gas leak from the tie-in and subsequent ignition is approximately 300 metres from the point of ignition; at 300 metres from the point of ignition buildings could be destroyed. At 311 metres from the point of ignition there is the potential for serious injury to persons. These distances of impact extend beyond the CariSal site boundary. Impacts from Release Scenario 4.b are depicted in Figure ES-1.

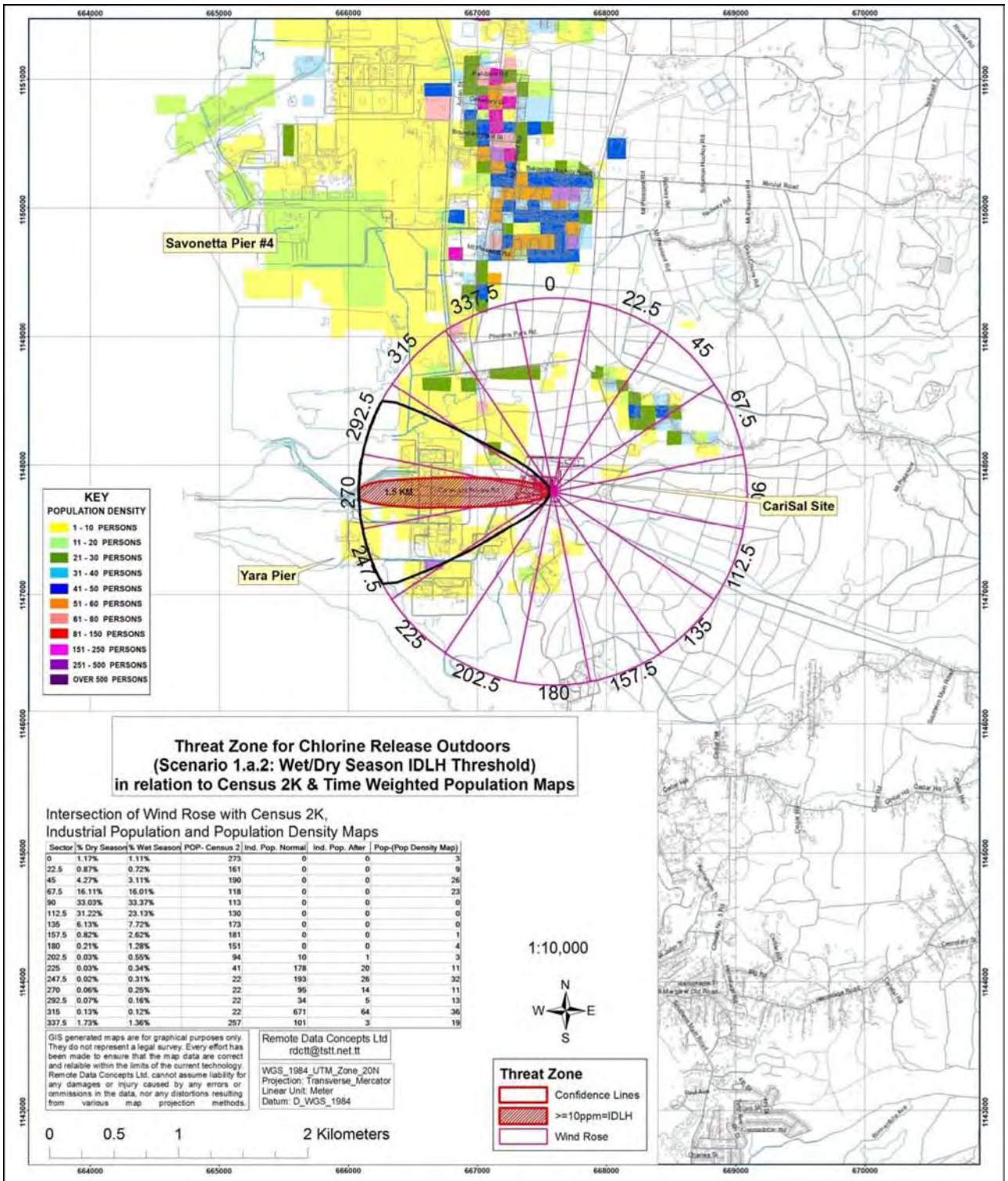
Modelling of onsite accidental releases of chlorine from process equipment indicated the potential for exceedance of the immediately dangerous to life and health (IDLH) concentration for chlorine of 10 parts per million (ppm) at offsite locations. Modelling indicates that, for an outdoor release of chlorine gas from onsite process equipment (Release Scenario 1.a.2), the IDLH concentration would be exceeded at 1,500 metres (1.5 kilometres) from the point of release on the CariSal plant site. Modelling indicates that, for an outdoor release of chlorine gas from onsite process equipment affected by a seismic event (Release Scenario 1.a.3, which is assumed to affect both process lines), the IDLH concentration for chlorine would be exceeded at 1,800 metres (1.8 kilometres) from the point of release on the CariSal site. Impacts from Release

Scenario 1.a.2 are depicted in Figure ES-2. Impacts from Release Scenario 1.a.3 are depicted in Figure ES-3.



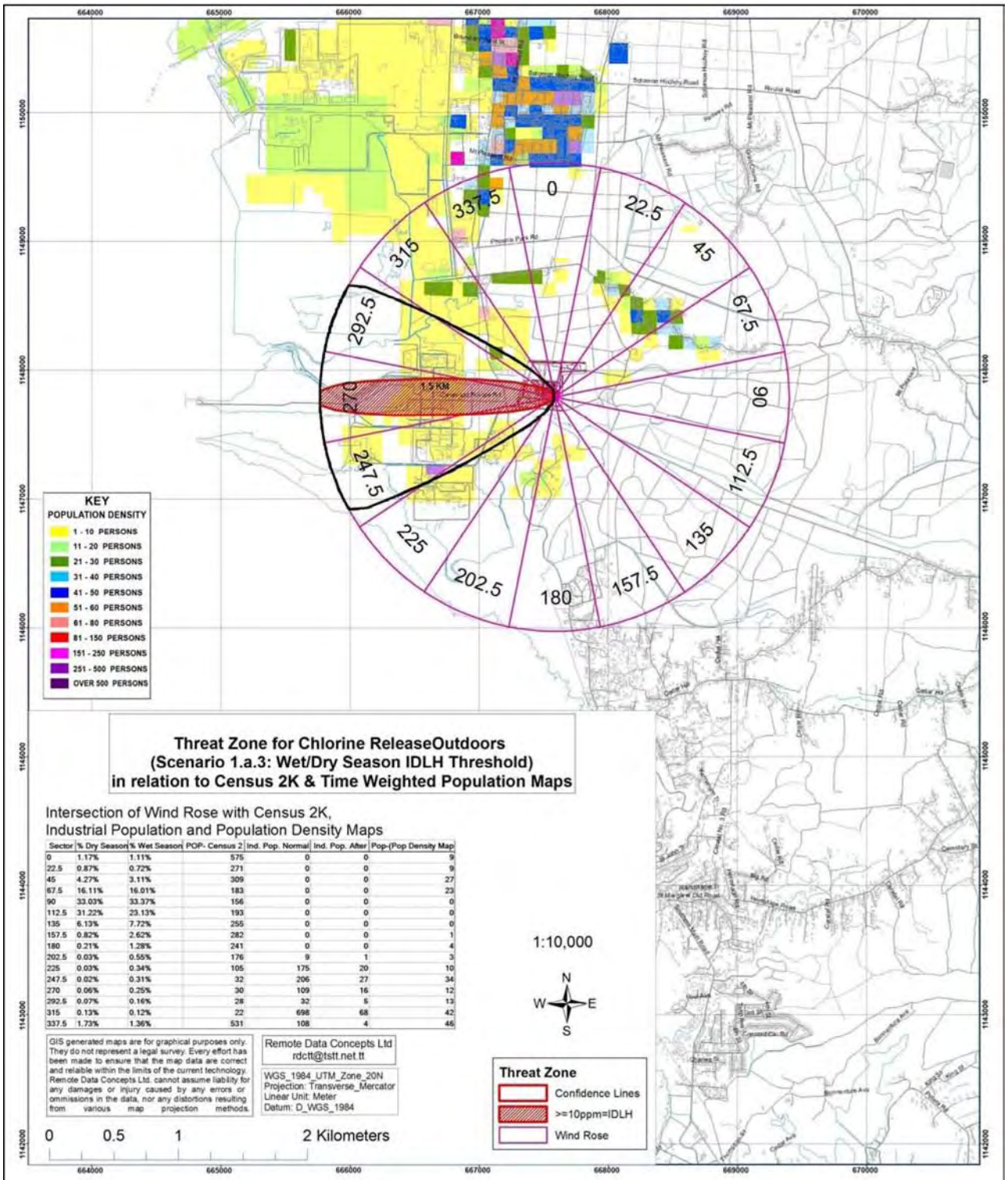
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0	0	1	0
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	0
315	0.13%	0.12%	0	0	1	0
337.5	1.73%	1.36%	0	0	1	0

Figure ES-1. Threat zone for offsite natural gas deflagration (Scenario 4.b: Wet/Dry



Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop-(Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	161	0	0	9
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure ES-2. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet/Dry Season,



Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop-(Pop Density Map
0	1.17%	1.11%	575	0	0	9
22.5	0.87%	0.72%	271	0	0	9
45	4.27%	3.11%	309	0	0	27
67.5	16.11%	16.01%	183	0	0	23
90	33.03%	33.37%	156	0	0	0
112.5	31.22%	23.13%	193	0	0	0
135	6.13%	7.72%	255	0	0	0
157.5	0.82%	2.62%	282	0	0	1
180	0.21%	1.28%	241	0	0	4
202.5	0.03%	0.55%	176	9	1	3
225	0.03%	0.34%	105	175	20	10
247.5	0.02%	0.31%	32	206	27	34
270	0.06%	0.25%	30	109	16	12
292.5	0.07%	0.16%	28	32	5	13
315	0.13%	0.12%	22	698	68	42
337.5	1.73%	1.36%	531	108	4	46

Figure ES-3. Threat zone for chlorine release, outdoors, seismic event (Scenario 1.a.3: Wet/Dry Season, IDLH Threshold) in relation to time-weighted population.

Modelling of accidental releases of hydrochloric acid from onsite storage tanks indicated the potential for exceedance of the IDLH concentration for hydrogen chloride gas of 50 ppm at offsite locations. A spill of hydrochloric acid into the storage tank secondary containment system could release hydrogen chloride gas to the atmosphere. Modelling indicates that for a spill of the entire contents of the 400,000-gallon (gal) (1514 m^3) hydrochloric acid storage tank capacity (Release Scenario 2.b), the IDLH concentration for hydrogen chloride gas would be exceeded at 2,500 metres (2.5 km) from the point of release on the CariSal plant site. Impacts from Release Scenario 2.b are depicted in Figure ES-4.

Modelling of accidental releases of liquid bleach from onsite storage tanks indicated the potential for exceedance of the IDLH concentration for hydrogen chloride gas of 50 ppm at offsite locations. Vapour pressure data for sodium hypochlorite solutions were obtained from page 6 of the Sodium Hypochlorite Manual (Chlorine Institute Pamphlet 96, Edition 3) for use in modelling accidental releases. Liquid spills of bleach into the storage tank secondary containment system or onto pavement could release chlorine monoxide gas to the atmosphere under certain conditions, including the presence of metals that could catalyze a chemical decomposition reaction. Metal catalysts are not likely to be present to interact with or decompose the bleach, and therefore generation of chlorine monoxide during a spill event is very unlikely to occur. The accidental release scenarios for liquid bleach spills are based on chlorine monoxide release in order to provide a conservative assessment. Impacts from Release Scenario 2.c are depicted in Figure ES-5.

Hydrochloric acid solution would be transported from the CariSal site to local customers and exported. Liquid spills of hydrochloric acid could release hydrogen chloride gas to the atmosphere. Modelling of offsite releases of liquid hydrochloric acid from transportation accidents indicates that the IDLH concentration for hydrogen chloride gas of 50 ppm would be exceeded at 3,300 metres (3.3 km) from the point of release. An offsite transportation accident could occur at any point along the transportation route from the CariSal site to customer locations. The specific point of release for the Scenario 6.a modelling was selected because it is adjacent to several industrial facilities and is close to a population centre. Impacts from Release Scenario 6.a are depicted in Figure ES-6.

Sodium hypochlorite (bleach) solution would be transported from the CariSal site to Savonetta Pier #4 in tank trucks. Liquid spills of bleach could release chlorine monoxide gas to the atmosphere if a spill occurs. The IDLH for hydrogen chloride gas is used as a surrogate for chlorine monoxide gas, for which there is no established IDLH concentration. Modelling of offsite releases from liquid bleach from transportation accidents indicates that the IDLH concentration for hydrogen chloride gas of 50 ppm would be exceeded at 1,500 metres (1.5 km) from the point of release. An offsite transportation accident could occur at any point along the transportation route from the CariSal plant to Savonetta Pier #4. The specific point of release for the Scenario 6.b modelling was selected because it is adjacent to several industrial facilities and close to a population centre. Impacts from Release Scenario 6.b are depicted in Figure ES-7.

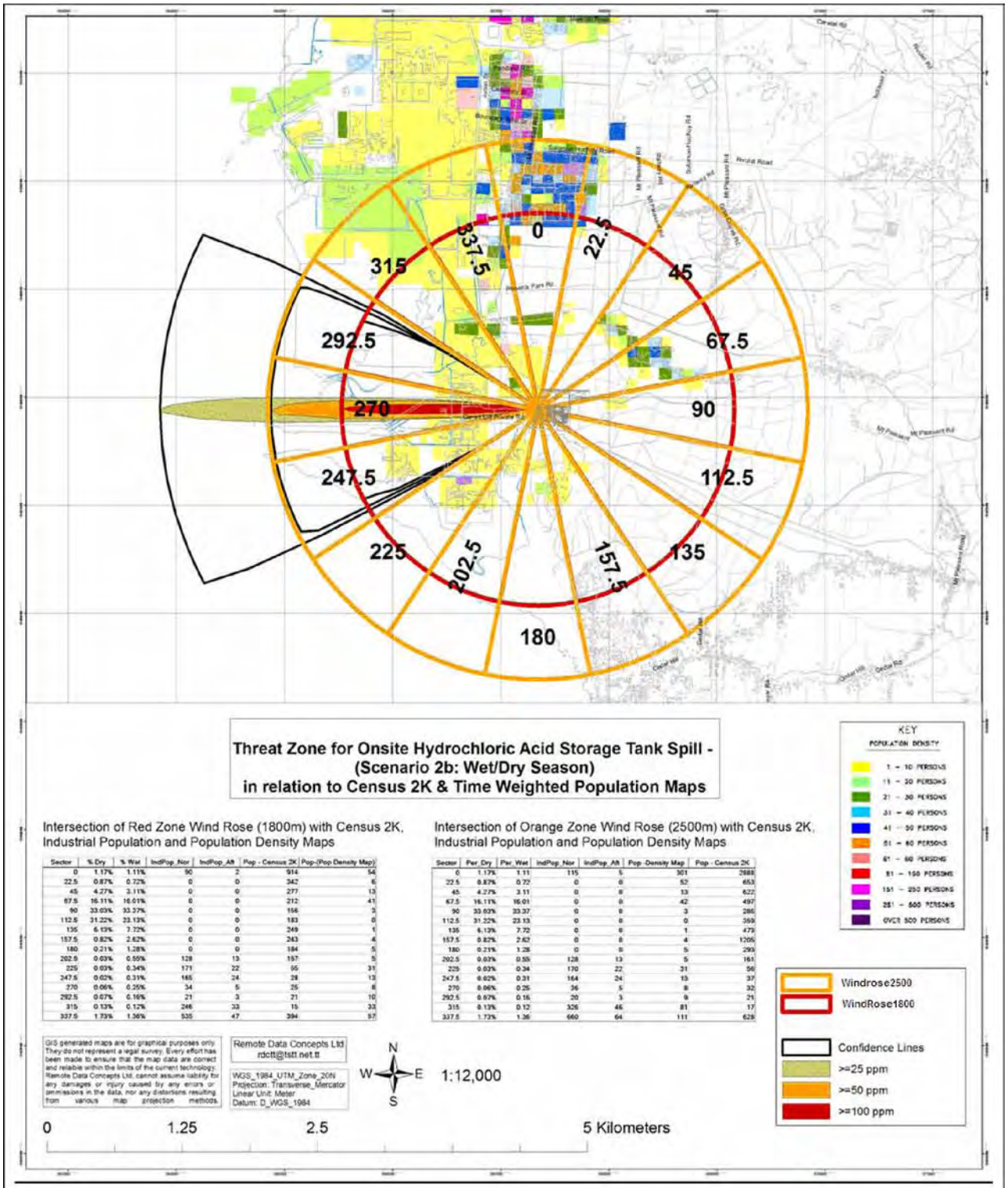


Figure ES-4. Threat zone for onsite hydrochloric acid storage tank spill) (Scenario 2.b: Wet/Dry Season) in relation to time-weighted population.

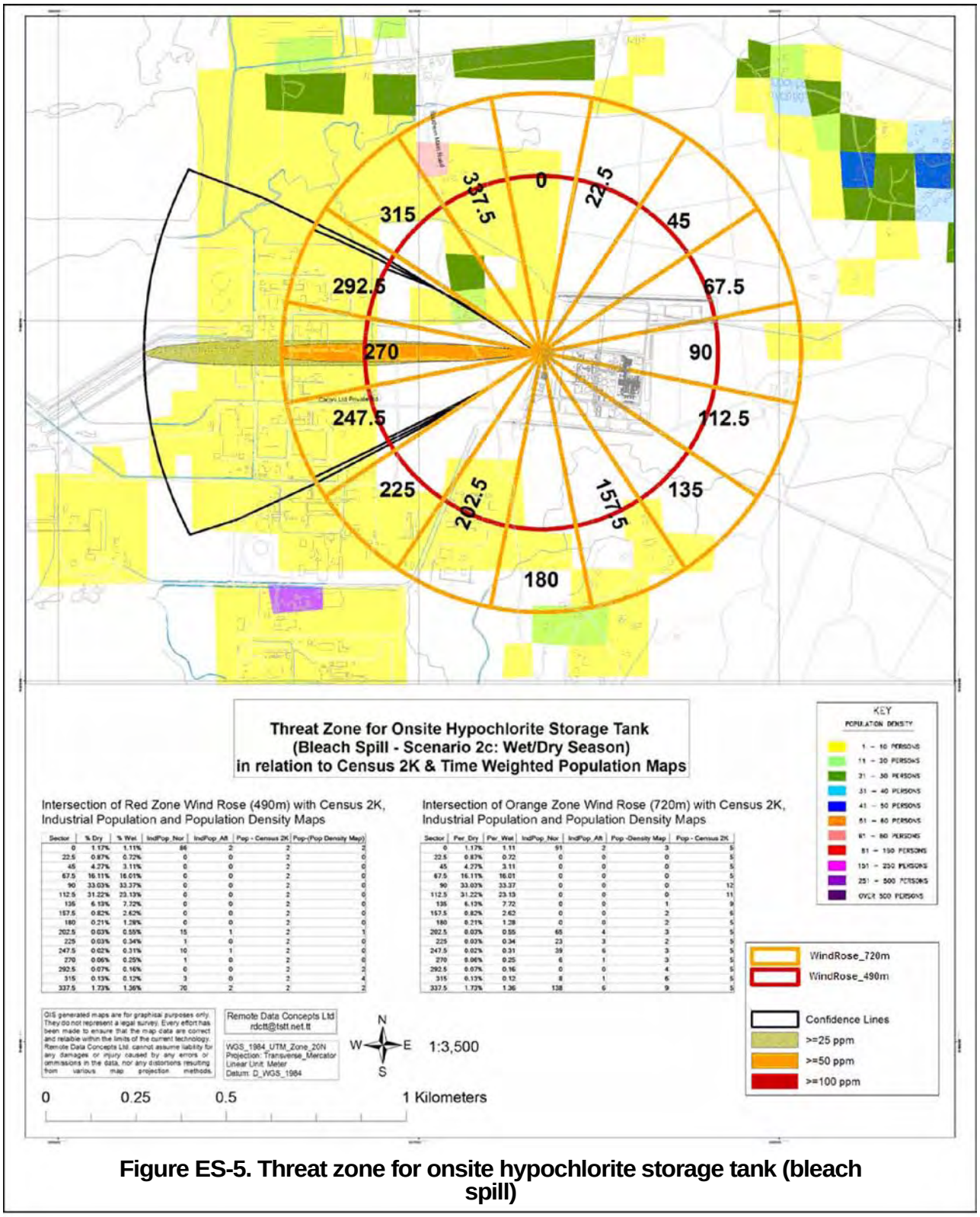
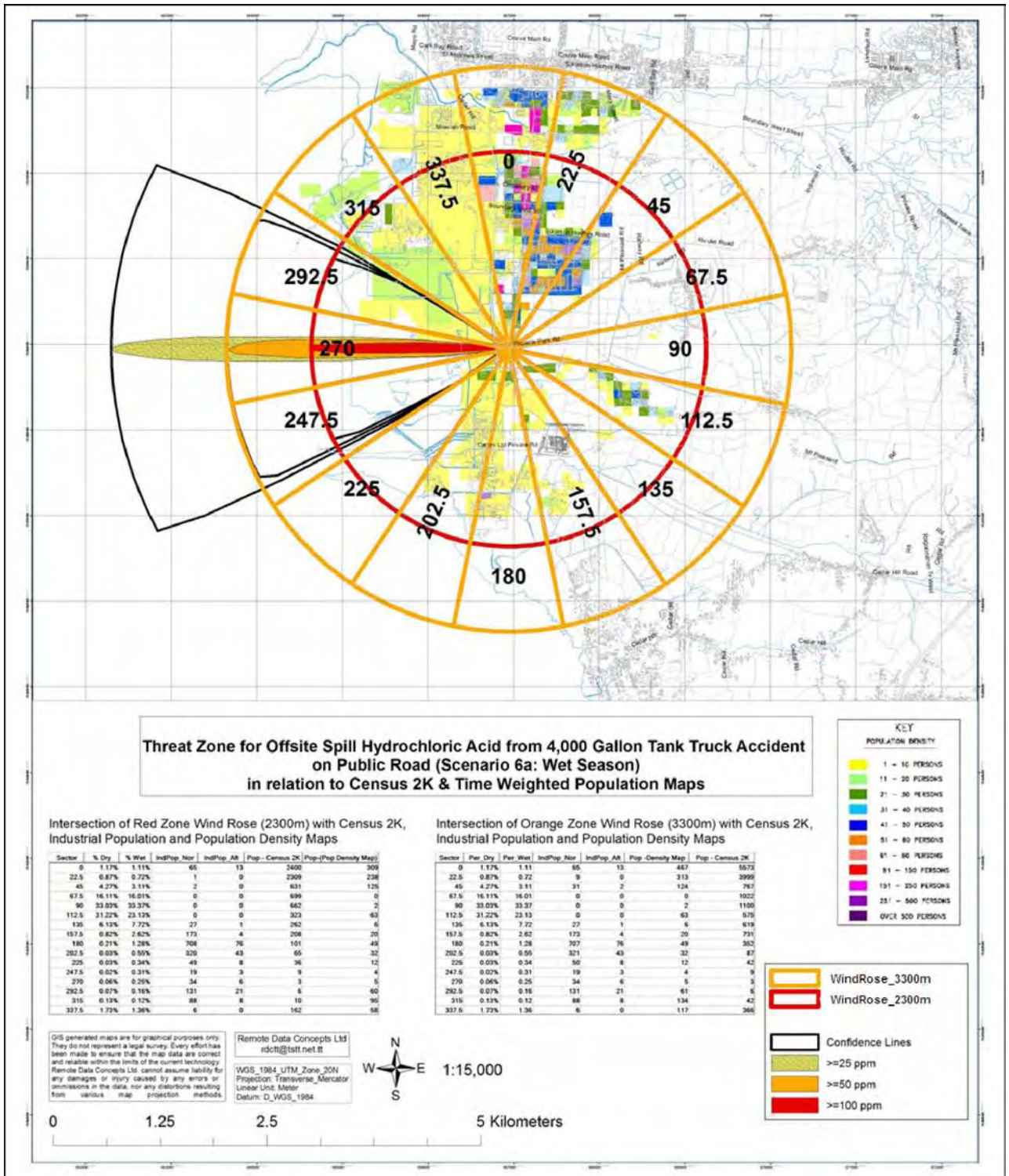


Figure ES-5. Threat zone for onsite hypochlorite storage tank (bleach spill)



Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	699	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	208	76	101	49
202.5	0.03%	0.55%	320	43	65	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	96
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3300m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per Dry	Per Wet	IndPop_Nor	IndPop_Alt	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	207	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

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WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

Figure ES-6. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Wet Season) in relation to time-weighted

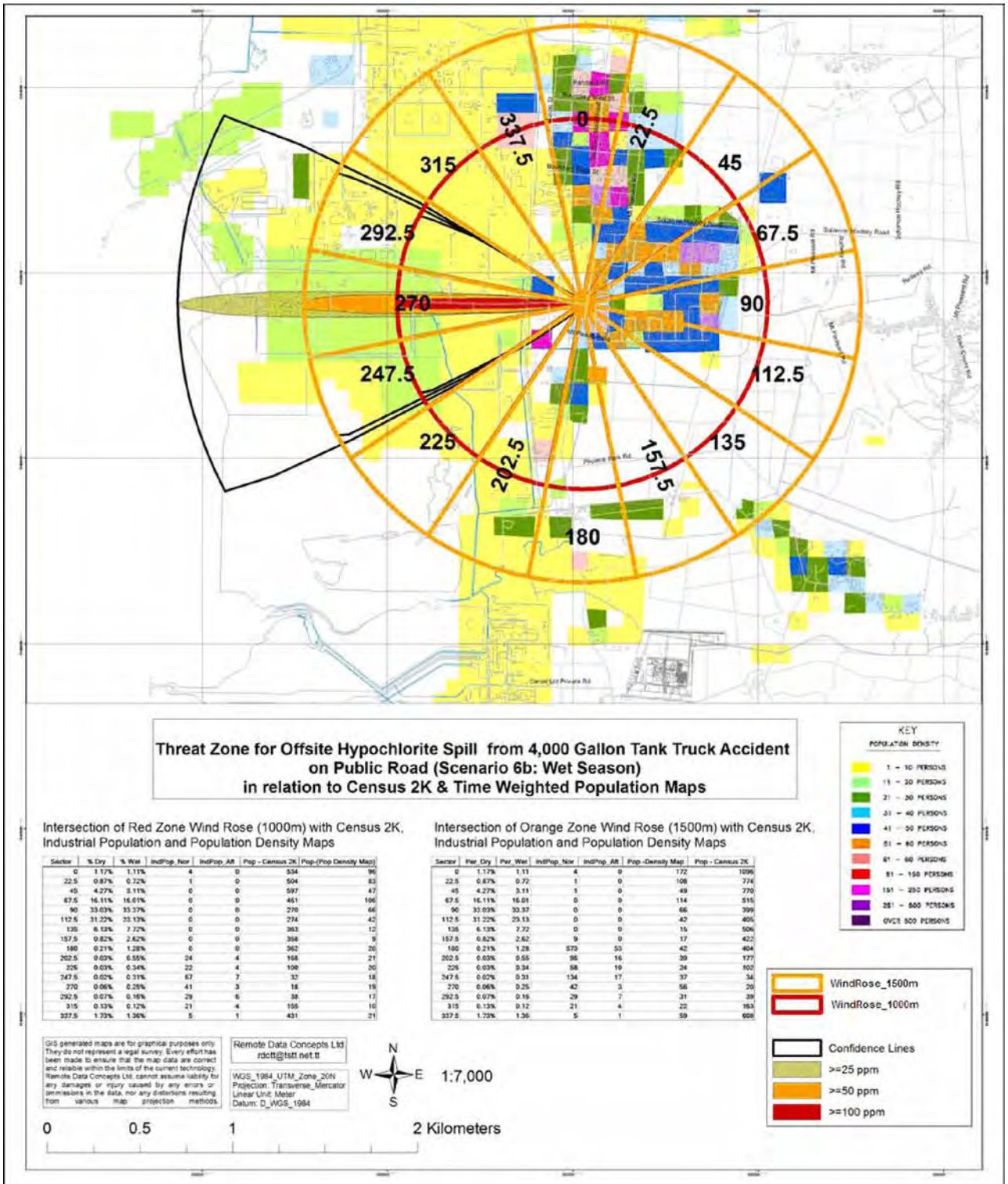


Figure ES-7. Threat zone for offsite spill of hypochlorite from 4,000-gallon tank truck accident on public road (Scenario 6.b: Wet Season) in relation to time-weighted population.

Determination of Individual Risk

Event frequencies shown in Table ES-8 for onsite hazardous materials release scenarios applied for the determination of individual risk are estimated based on the design standards and guidelines for the CariSal facility process design. The event frequency for offsite hazardous materials release scenarios (transportation accident Scenarios 6.a. and 6.b.) applied for the determination of individual risk is estimated from data published by the FMCSA.

The frequency of exposure for all of the accidental release scenarios except for natural gas (Scenario 4.b) is set at the frequency at which the wind is towards the direction of the closest offsite receptor (i.e., winds from the direction of 112.5 degrees and toward the direction of 292.5 degrees.) Based on wind direction data, the average frequency of the wind being from this direction for the wet season and dry season is approximately 27 percent. The frequency of exposure (probability of ignition) for Scenario 4.b is assumed to be 100 percent. The zone of influence for Scenario 4.b. is not dependent on wind direction, as the scenario is based on the assumption that ignition of the natural gas occurs at the point of release.

The frequency of occupation of residential structures is assumed to be 70 percent, i.e., residential structures are occupied 70 percent of the time.

The individual risk is the product of the event frequency, frequency of exposure, and frequency of occupation. Scenarios for which no offsite consequences are estimated are assigned a risk of zero in Table ES-8.

The zone of influence for all of the hazardous material accidental release scenarios except for natural gas deflagration is defined as the zone in which the IDLH concentration for the hazardous material is exceeded. For natural Scenario 4.b. (natural gas deflagration) the zone of influence is defined at the zone in which damage to buildings and structures could occur from the force of an explosion.

For the purposes of comparison with the risk ratings in Table ES-8, the probabilities of death from common hazards are shown in Table ES-9.

The locations of community facilities and sensitive receptors, including schools, churches, and hospitals are illustrated in the Figures 5.2-1b through 5.2.17b relative to the modelled hazardous material release scenario results. The number of sensitive receptors associated with each scenario listed in Table ES-8 is included in the right-hand column of the table. As shown for the onsite chlorine release scenarios (Scenarios 1.a.1., 1.a.2., and 1.b.2, twelve community facilities and sensitive receptors are within the zone of influence. For the onsite hydrochloric acid release scenario (Scenario 2.b.) a total of twenty-six community facilities and sensitive receptors are within the zone of influence. For the offsite hydrochloric acid and hypochlorite release scenarios (transportation spills) the number of community facilities and sensitive receptors is dependent to some extent on the location of the event; a transportation spill could occur at any point along the transportation route. For the purposes of this analysis it has been assumed that the transportation spill would occur in the vicinity of population centres and community and sensitive receptors, and the modelled location of the transportation spill events was selected specifically to maximize

Table ES-8. Accident Scenario Individual Risk

No.	Scenario	Type	Event Frequency[a]	Frequency of Exposure[b]	Frequency of Occupation[c]	Risk[d]	Sensitive Receptor
1.	*Onsite hazardous material (gaseous) release*						
1.a.1	Chlorine [indoor] process pipe breach	Cl2 release	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twelve
1.a.2	Chlorine [outdoor] process pipe breach	Cl2 release	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twelve
1.a.3	Chlorine process pipe breach [seismic event]	Cl2 release	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twelve
1.b	Intermixing of Hypochlorite with HCl	Cl2 release	$1x10^{-7}$[e]	0.27	0.7	$2x10^{-8}$	Six
2.	*Onsite hazardous material (liquid) release*						
2.a	Vessel Failure: Onsite NaOH storage tank	NaOH spill	$1x10^{-6}$	Zero	NA	*Zero*	None
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twenty six
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Two
3.	*Flammable gas release (dispersion)*						
3.a.1	Hydrogen [indoor] process pipe breach	H2 release	$1x10^{-6}$	*Zero*	NA	*Zero*	None
3.a.2	Hydrogen [outdoor] process pipe breach	H2 release	$1x10^{-6}$	*Zero*	NA	*Zero*	None
3.a.3	Hydrogen process pipe breach [seismic event]	H2 release	$1x10^{-6}$	*Zero*	NA	*Zero*	None
3.b.1 3.b.2	Hydrogen vent stack release HCl scrubber stack release	H2 release H2 release	$1x10^{-6}$ $1x10^{-6}$	*Zero* *Zero*	NA NA	*Zero* *Zero*	None None
4.	*Flammable gas release (deflagration)*						
4.a	Onsite Natural gas deflagration	CH4 release	$1x10^{-6}$	*Zero*	NA	*Zero*	None
4.b	Offsite Natural gas deflagration	CH4 release	$1x10^{-6}$	1.0	0.7	$3x10^{-7}$	None
5	*Offsite facility hazardous material release*						
5.a	Vessel Failure: Offsite EISL Facility caustic tank breach	NaOH spill	$1x10^{-6}$	*Zero*	NA	*Zero*	None
5.b	Offsite caustic pipeline breach	NaOH spill	$1x10^{-6}$	*Zero*	NA	*Zero*	None
6.	*Offsite transportation hazardous material release*						
6.a	Hydrochloric acid: 4,000 gallon (15,140 L) tank truck accident	HCl spill	$3x10^{-7}$	0.27	0.7	$5x10^{-8}$	Forty
6.b	Hypochlorite: 4,000 gallon (15,140 L) tank truck accident	bleach spill	$3x10^{-7}$	0.27	0.7	$5x10^{-8}$	Thirty two

[a] Event frequency is estimated based on the CariSal process design standards for Scenarios 1 through 5. Frequency of transportation accidents (Scenarios 6.a. and 6.b.) was estimated from data published by the FMCSA.

[b] Frequency of Exposure of "Zero" indicates that there are no modelled offsite consequences associated with this release scenario; frequency of exposure for accidental release scenarios is equal to the frequency of wind direction towards the closest offsite receptor (27%); frequency of exposure for natural gas deflagration scenarios is independent of wind direction, frequency of ignition is assumed to be 1.0

[c] Frequency of occupation is 0.7 for an offsite residence or public building

[d] NA = not applicable

[e] Event frequency based on application of incompatible truck nozzle design to hypochlorite and hydrochloric acid storage and loading equipment

Reference: Crowl and Louvar, 2001

Reference: Craft, 2004

Table ES-9. Risk of Death from Common Hazards

Event	Probability of Death (per year)	Recurrence Interval (years)
From heart disease	2.94×10^{-3}	340
In a motor vehicle	2.00×10^{-4}	5,000
Breast cancer / Prostate cancer	1.43×10^{-4}	7,000
AIDS	5.26×10^{-5}	19,000
From a fall	5.00×10^{-5}	20,000
From a workplace accident	3.85×10^{-5}	26,000
Due to complications from surgery	1.25×10^{-5}	80,000
From food poisoning	1.16×10^{-5}	86,000
From choking	6.25×10^{-6}	160,000
In an airplane crash	4.00×10^{-6}	250,000

Source: EcoEngineering Consultants Limited 2006, Page 47.

the number of community facilities and sensitive receptors within the zone of influence. For the offsite hydrochloric acid release scenario (Scenario 6.a.) there are forty community facilities and sensitive receptors within the zone of influence; for the offsite hypochlorite release scenario (Scenario 6.b.) there are thirty-two community facilities and sensitive receptors within the zone of influence.

Determination of Societal Risk

Table ES-10 shows the EMA Societal Risk Guidelines for QRA.

Table ES-10. Societal Risk Guidelines

Number of Affected Persons	Incident Frequency
10	1×10^{-4}
100	1×10^{-6}
1,000	1×10^{-8}
10,000	1 x 10-10

The number of offsite residential individuals within the zone of influence for each scenario is estimated using year 2000 census data and the frequency of wind direction. The number of offsite industrial workers within the zone of influence for each scenario is estimated from the locations and employment data for neighbouring industrial facilities and the frequency of wind direction.

Societal risk is estimated for each accident scenario by ranking the scenarios based on risk probability as a function of individual risk, with respect to population groups (i.e., the individual risk associated with the accident scenario multiplied by the number of people exposed represent the affected population.) The affected population and frequency of occurrence for each accident scenario is evaluated based on the EMA Societal Risk Guidelines and depicted in the form of an F-n diagram.

Table ES- 11 shows the offsite population exposure summary, including the number of residential individuals and industrial workers within the zone of influence and the total number of individuals within the zone of influence. As shown, based on the frequency and number of

individuals within the zone of influence, Scenarios 1.a.1, 1.a.2, 1.a.3, 1.b., 2.b., 2.c., 4.b., 6.a., and 6.b. are below the EMA Societal Risk Guidelines. The number of individuals within the zone of influence for each scenario, the frequency, and the relationship of these to the EMA Guidelines are illustrated in Figure ES-8.

Table ES-11. Offsite Population Exposure Summary

No.	Scenario	Type	Offsite Persons Within Zone of Influence				Scenario Risk	EMA Guide
			Figure	Resident	Industrial	Total		
2.	*Onsite hazardous material (gaseous) release*							
1.a.1	Chlorine [indoor] process pipe breach	Cl2 release	5.2-1a	2387	1423	16590	$2x10^{-7}$	$3.7 x10^{-7}$
1.a.2	Chlorine [outdoor] process pipe breach	Cl2 release	5.2-4a	2387	1423	16590	$2x10^{-7}$	$3.7 x10^{-7}$
1.a.3	Chlorine process pipe breach [seismic event]	Cl2 release	5.2-7a	37131	1514	188135	$2x10^{-7}$	$2.8 x10^{-7}$
1.b	Intermixing of Hypochlorite with HCl	Cl2 release	5.2-9a 5.2-10a	834	5110	5944	$2x10^{-7}$	$2.9 x10^{-6}$
2	*Onsite hazardous material (liquid) release*							
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	5.2-12a	60280	9714	158294	$2x10^{-7}$	$4.0 x10^{-7}$
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	5.2-13a	36.27	153.63	1810	$2x10^{-7}$	
4.	*Flammable gas release (dispersion)*							
4.b	Offsite Natural gas deflagration	CH_4 release	5.2-18a	11	00	11	$3x10^{-7}$	$1.0 x10^{-4}$
6.	*Offsite transportation hazardous material release*							
6.a	Hydrochloric acid: 4,000 gallon (15,140 L) tank truck accident	HCl spill	5.2-19a 5.2-20a	63612	8215	145626	$3x10^{-7}$	$4.73 x10^{-7}$
6.b	Hypochlorite: 4,000 gallon (15,140 L) tank truck accident	bleach spill	5.2-21a	53300	626	114305	$3x10^{-7}$	$7.68 x10^{-7}$

[a] The zone of influence for this scenario does not extend to the closest residential structure

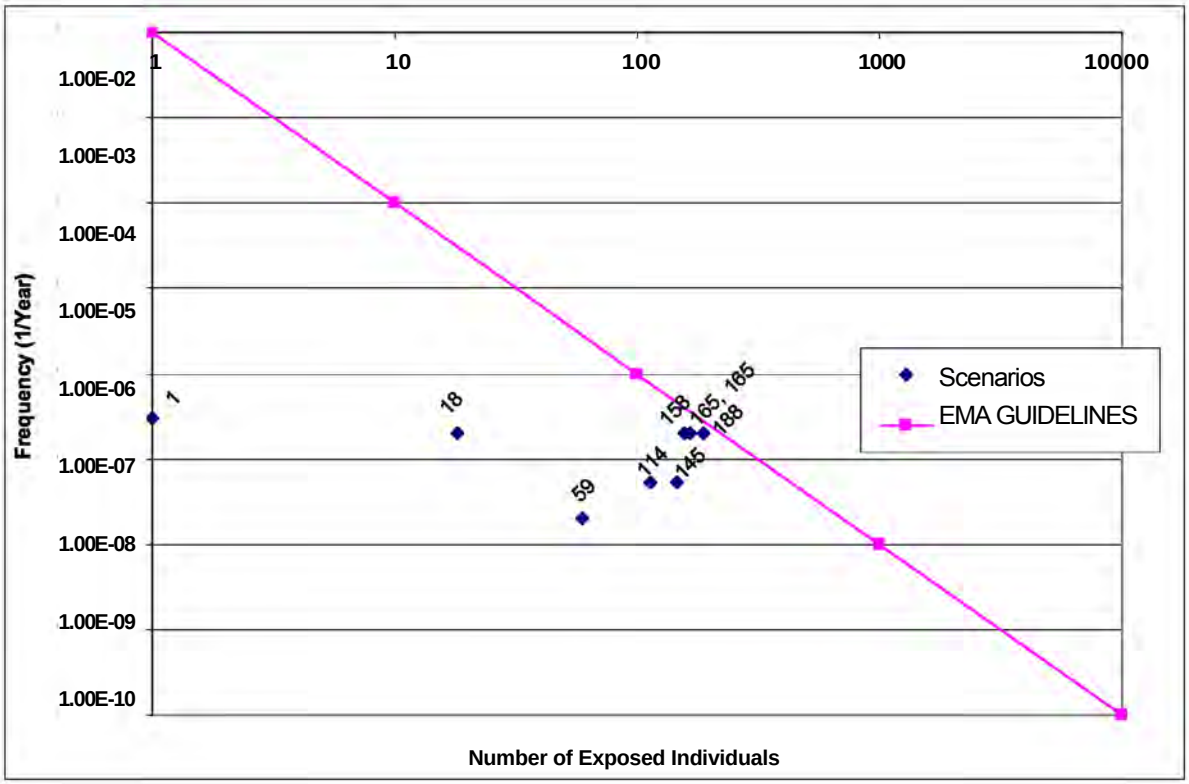


Figure ES-8. Fn-Curve: CariSal facility.

1.0 INTRODUCTION

11 OVERVIEW

This Quantitative Risk Assessment (QRA) was prepared by ICF International in accordance with ICF International's contract with DaCosta Gwendoline – The Environmental Solutions Company, Ltd. and in accordance with the QRA Protocol prepared by ICF International and submitted to the Trinidad and Tobago Environmental Management Authority (EMA).

This Appendix to the Environmental Impact Assessment for the proposed CariSal Unlimited chlor-alkali plant documents the methodology and findings of the QRA. The remainder of this chapter presents the scope of work and objectives of the QRA; describes the background for the Project; and outlines the risk assessment methodology and applicable standards. Chapter 2 describes the Project, including the proposed chlor-alkali plant, offsite (ex-situ) facilities, and raw material and product transportation routes. Chapter 3 describes the physical setting within which the proposed project would operate and study areas for the risk assessment for the proposed plant, ex-situ facilities, and transportation routes. Chapter 4 describes the accident scenarios considered in the QRA, and Chapter 5 describes the results of hazard and consequence analyses for the accident scenarios. Chapter 6 and Chapter 7 summarize the individual and societal risk, respectively, associated with the accident scenarios. Chapter 8 describes additional analyses conducted for construction accident scenarios and alternative plan configurations. Chapter 9 summarizes the risk results for the Project, and Chapter 10 describes potential cumulative impacts associated with existing and anticipated facilities in the vicinity of the Project.

Attachments to the QRA include Attachment 1, modelling runs for the release scenarios described in Chapter 4, Attachment 2, Materials Safety Data Sheets (MSDS) for hazardous materials on the site and Attachment 3, which contains larger scale versions of maps and figures presented in or relevant to this QRA.

1.2 SCOPE OF WORK AND OBJECTIVES

The scope of work and objectives of this QRA are to:

- Conduct a QRA to assess, quantify, and depict risks associated with construction and operation of the proposed chlor-alkali plant, ex-situ facilities, and raw material and product transportation operations;
- Address potential construction and operation hazards of the proposed project including:
  - Fires,
  - Explosions,
  - [Ex-situ] Pipeline Leaks
  - Process Upset Conditions
  - Process Vent Releases
  - Process Piping Leaks
  - Vessel Failures, and
  - Natural Hazards.

- Assess the effects on the environment of identified hazards;
- Assess the ability of the community to respond to identified hazards; and
- Quantify projected individual risk and societal risk associated with identified hazards.

1.3 Project Background

CariSal Unlimited (CariSal) proposes to construct a chlor-alkali plant adjacent to the existing Point Lisas South and East Industrial Estate (PLSEIE) for the production of calcium chloride, caustic soda, sodium hypochlorite and hydrochloric acid with high quality industrial water as a byproduct. On December 22, 2006, CariSal submitted an application for a Certificate of Environmental Clearance to the Trinidad and Tobago EMA. The EMA has reviewed that application and has determined that there would be significant environmental impacts that could arise from the proposed activities and that the application requires an Environmental Impact Assessment (EIA) in compliance with a Terms of Reference (TOR). The final TOR identifies the need for risk assessment modelling analysis as part of the EIA. This QRA is being submitted to the EMA in accordance with the TOR as an Appendix to the EIA.

1.4 Project Location

The proposed chlor-alkali plant would occupy an approximately 11.8-hectare (ha) lot of land. Figure 4.2-2 in the Chapter 4 section of the Map Book (Chapter 10 of the EIA) shows the facility location in relation to land use, existing roads, and other development in the area. Beyond the northern edge of the CariSal site is undeveloped land and an adjacent gravel and cement works and, 1 kilometre (km) away, Phoenix Park Road. The CariSal site is bounded to the east by a National Gas Company (NGC) pipeline right-of-way (ROW) and a Trinidad and Tobago Electricity Commission (T&TEC) transmission corridor. The 120-ha site of the proposed Westlake polyethylene production facility is adjacent to these corridors. The T&TEC reserve lands form the southern boundary of the CariSal site with the North Sea Road and NGC ROW corridor located farther to the south. Beyond these reserve lands and the road are the 204-ha site of the proposed Essar steel works to the southeast and the Savonetta residential estates to the south. To the west of the proposed CariSal site are the Caroni Railway ROW (land owned by the NEC), and Southern Main Road, and beyond them, Yara Trinidad Limited, an ammonia plant on the Point Lisas Port Development Company (PLIPDECO) industrial estate. Industrial Gases Limited lies to the southwest as does Phoenix Park Gas Processors Limited (PPGPL); Caribbean Nitrogen Company Limited (CNC) lies to the northwest. Northern Construction and EZYCON are to the northwest between Southern Main Road and the Caroni railway reserve. The nearest residential structure is approximately 50 metres (m) from the western facility boundary; the nearest school is to the northwest approximately 900 m away on Southern Main Road.

1.5 METHODOLOGY

This section summarizes the risk assessment methodology and quantitative modelling procedures that were used in evaluating the potential accident scenarios for reasonably foreseeable accidents, including potential accidental releases of hazardous and flammable materials. The risk assessment methodology was applied to assess the frequency and potential consequences of accidents during facility operations over the proposed 20-year life span of the facility. The methodology was developed following those methodologies used in EIAs prepared for existing and proposed facilities in the vicinity of the CariSal site, and recommendations provided in the TOR and the U.S. Environmental Protection Agency (EPA) Guidelines on Air Quality Models (GAQM), Appendix W to 40 U.S. Code of Federal Regulations Part 51, which relate to application of stability categories and meteorological data to the ALOHA model. Public health impacts associated with hazardous material release accident scenarios have been evaluated relative to the Trinidad and Tobago air quality permissible levels as documented in the draft Trinidad and Tobago Air Pollution Rules (2005) and relative to other relevant short-term exposure guidelines.

The risk assessment methodology considers individual risk and societal risk for the identified accident scenarios. Individual risk (Chapter 6) is defined as the numerical probability that an individual would experience a particular adverse effect, for example, exposure to chlorine gas at a concentration in excess of established exposure standards, as a result of an accident. Societal risk (Chapter 7) evaluates the individual risk in the context of the size of the exposed population.

CariSal prepared a Process Hazard and Environmental Risks Identification (HAZID) for the proposed chlor-alkali plant as part of the engineering design for the proposed project (Conve & AVS Inc. 2007). The HAZID identified and evaluated material and activity hazards related to the proposed onsite operations of the chlor-alkali facility. Material hazards are those related to the intrinsic properties of materials (e.g., chlorine.) Activity hazards are those related to activities conducted during operation of the facility. The HAZID does not evaluate hazards associated with ex-situ facilities or offsite activities, for example, raw material and product transportation or hazards associated with construction activities. The HAZID established definitions for the likelihood (probability) rating and severity (consequences) rating of the hazards evaluated and established a risk matrix that was applied to prioritize the identified hazards. These definitions were applied to select and screen hazards for further consideration in this QRA.

1.5.1 Likelihood (Probability) Definition

Accident scenarios identified in the QRA have been assigned a likelihood (probability) category rating in accordance with the definitions described in the HAZID. The likelihood (probability) definitions consider the frequency of the event, historical industry experience, and the layers of design and operational protections designed to prevent the event from occurring. Table 1.5-1 describes the definitions for the five likelihood (probability) categories. The likelihood ratings for accident scenarios in the HAZID do not incorporate redundancies designed into the CariSal facility process, and therefore these likelihood ratings for the accident scenarios have only been used for the preliminary risk ranking for the selection of accident scenarios for further analysis in this QRA. Accident scenario probabilities for the purposes of individual and societal risk

assessment are based on the CariSal process design including redundancies designed into the CariSal facility process.

Table 1.5-1. Likelihood (Probability) Definitions

LEVEL	LIKELIHOOD (PROBABILITY) DEFINITIONS
1	*Categories*
a.	Frequency: 0.0 to 1 x 10^{-6} (never to 1 in 1,000,000 years)
b.	Hazard Scenario: Should not occur in the life of the process and there is no historical industry experience to suggest it will occur.
c.	Layers of Protection: Procedures or operator interface relied upon to prevent unwanted events
2	*Categories*
a.	Frequency: 1 x 10^{-6} to 1 x 10^{-4} (1 in 1,000,000 years to 1 in 10,000 years)
b.	Hazard Scenario: Similar events are unlikely to occur, but have historically occurred in this type of process somewhere within the industry.
c.	Layers of Protection: Single layer of safeguard and operator interface are in place to prevent unwanted events.
3	*Categories*
a.	Frequency: 1 x 10^{-4} to 1 x 10^{-3} (1 in 10,000 years to 1 in 1,000 years)
b.	Hazard Scenario: This particular scenario is likely to occur somewhere in the industry during the life of this general type of process.
c.	Layers of Protection: Two independent highly reliable safeguards are in place; failure of one safeguard would not initiate an unwanted event.
4	*Categories*
a.	Frequency: 1 x 10^{-3} to 1 x 10^{-2} (1 in 1,000 years to 1 in 100 years)
b.	Hazard Scenario: This particular scenario is almost certainly to occur somewhere in the industry during the life of this specific type of process (but not necessarily at this location).
c.	Layers of Protection: Three independent highly reliable safeguards are in place; failure of two safeguards would not initiate an unwanted event.
5	*Categories*
a.	Frequency: 1.0 x 1 to 10^{-2} (always to 1 in 100 years)
b.	Hazard Scenario: This particular scenario has occurred somewhere in the industry in this specific process or is likely to occur at this location during the life of this facility.
c.	Layers of Protection: Four or more independent highly reliable safeguards are in place; failure of three safeguards would not initiate an unwanted event.

Reference: Conve & AVS Inc. 2007, Page 8

1.5.2 Severity (Consequence) Definition

Accident scenarios identified in the QRA have been assigned a severity (consequence) category rating in accordance with the definitions described in the HAZID. The severity (consequence) rating definitions consider the potential for onsite injuries, onsite property damage, environmental impact, loss of production, and offsite environmental, health, and safety impacts. Table 1.5-2 describes the definitions for the five severity (consequence) rating categories. The consequence ratings for accident scenarios in the HAZID do not incorporate redundancies designed into the CariSal facility process, and therefore these consequence ratings for the accident scenarios have only been used for the preliminary risk ranking for the selection of accident scenarios for further analysis in this QRA. Accident scenario consequences for the

purposes of individual and societal risk assessment are based on the CariSal process design including redundancies designed into the CariSal facility process.

Table 1.5-2. Severity (Consequence) Definitions

LEVEL	SEVERITY (CONSEQUENCE) DEFINITION
1	*Categories*
a.	Minor onsite injuries (first aid and non-disabling, reportable injuries).
b.	Property damage less than base level amount.*
c.	Minor environmental impact (no remediation).
d.	Loss of production less than base level amount.*
e.	No offsite impact or damage.
2	*Categories*
a.	Serious onsite injuries (temporary disabling worker injuries).
b.	Property damage 1 to 20 times base level.
c.	Moderate environmental impact (cleanup or remediation in less than one week and no lasting impact on food chain, terrestrial life, or aquatic life).
d.	Loss of production from 1 to 20 times base level.
e.	Minor offsite impact (public nuisance – noise, smoke, odour, traffic).
f.	Potential adverse public reaction.
3	*Categories*
a.	Permanent disabling onsite injuries or possible fatality.
b.	Property damage 20 to 50 times base level.
c.	Significant environmental impact (cleanup or remediation in less than one month and minor impact on food chain, terrestrial life, or aquatic life).
d.	Loss of production from 20 to 50 times base level.
e.	Moderate offsite impact limited to property damage, minor health effects to the public or first aid injuries.
f.	Adverse public reaction.
4	*Categories*
a.	Onsite facility or less than 4 permanent disabling worker injuries.
b.	Property damage 50 to 200 times base level.
c.	Serious environmental impact (cleanup or remediation requires three to six months and moderate impact on food chain, terrestrial life and/or aquatic life).
d.	Loss of production from 50 to 200 times base level.
e.	Significant offsite impact property damage, short-term health effects to the public or temporary disabling injuries.
f.	Significant public concern or reaction.
5	*Categories*
a.	Multiple onsite fatalities or 4 or more permanent disabling onsite injuries.
b.	Property damage greater than 200 times base level.
c.	Extensive environmental impact (cleanup or remediation exceeding six months, significant loss of terrestrial life or aquatic life or damage to food chain uncertain).
d.	Loss of production greater than 200 times base level.
e.	Severe offsite impact property damage, offsite fatality, long term health effect or disabling injuries.
f.	Severe adverse public reaction threatening facility continued operations.

Reference: Conve & AVS Inc. 2007, Pages 9 and 10

1.5.3 Risk Matrix

Accident scenarios were assigned an initial risk rating by applying the likelihood (probability) and severity (consequences) ratings to the risk matrix and then applying the risk definitions described in the HAZID. The risk matrix is shown in Table 1.5-3, and the risk definitions are shown in Table 1.5-4.

Table 1.5-3. Risk Matrix (R = P x C)

		Consequence				
		1	2	3	4	5
	5	C	C	D	E	E
	4	B	C	C	D	E
	3	B	B	C	D	D
	2	A	B	C	C	D
	1	A	A	B	C	D

Table 1.5-4. Risk Definition

A.	No further action or safety study is required. Individual personnel judgment required for operation to occur.
B.	Document process safety studies, hazard and risk reducing measures. Consider feasibility and cost benefit of additional risk reducing measures. Supervisor approval is required for operation.
C.	Document process safety studies; evaluate feasibility of additional risk reducing features and implement if worker exposure can be reduced to a lower level. Operating Group approval is required for operation.
D.	Document process safety studies, hazards, and risk reducing measures. Identify additional risk reducing measures and implement if work exposure can be reduced to a lower level. Divisional management approval is required for operations.
E.	Additional process safety studies and risk reducing measures are mandatory to achieve lower risk. Corporate senior management approval required for operations.

Reference: Conve & AVS Inc. 2007, Page 10

1.5.4 Accident Scenario Screening

Accident scenarios were identified for consideration in the QRA based on the hazards identified in the HAZID and based on review of process flow diagrams and consideration of the proposed process design and operation. The QRA also considers hazards associated with the design and operation of ex-situ facilities and offsite transportation operations, operations that were not evaluated in the HAZID. Accident scenarios were screened for further consideration in the QRA using the likelihood (probability) rating, severity (consequence) rating, and risk definitions described in the HAZID. The same screening criteria were applied to ex-situ and offsite operations as to onsite operations for the purposes of the accident screening analysis.

Accident scenarios for which a risk rating of "A" (the lowest risk rating in Table 1.5-3) was assigned based on application of the likelihood and severity ratings in Table 1.5-1 and Table 1.5- 2 are not further evaluated in this QRA. Accident scenarios for which a risk rating of "B" was assigned are generally evaluated semi-quantitatively in the QRA. Quantitative consequence modelling is not generally applied to the "B" risk rated accident scenarios because these accident scenarios, for the most part, are not anticipated to result in offsite consequences. Quantitative consequence modelling is generally applied to accident scenarios for which a risk rating of "C" was assigned, primarily based on the potential for these scenarios to result in offsite

consequences (e.g., potential chlorine gas release and subsequent offsite dispersion.) Only one accident scenario evaluated in the HAZID resulted in a "D" risk rating: a transformer/rectifier fire affecting the chlor-alkali plant electrical system. The basis for this rating was the high probability of occurrence and the potential for onsite consequences to the chlor-alkali facility including equipment damage and potential extended loss of plant production. Quantitative consequence modelling is not applied to this accident scenario because the scenario does not involve potential release of hazardous materials (e.g., chlorine).

1.5.5 Accidental Release Modelling Methodology

The Aerial Locations of Hazardous Atmospheres (ALOHA) model was applied to model accidental releases of hazardous materials (e.g., chlorine). The ALOHA model is designed to predict how a hazardous gas (both neutral and dense) cloud disperses after an accidental release based on chemical and material property information.

> ALOHA is designed as an emergency response model to predict behaviour during an accidental chemical release. ALOHA can predict rates of chemical release from leaking tanks and evaporating puddles as well as the dispersion of both neutrally buoyant and heavier-than-air gases (chlorine). Location-specific data, as detailed below, was used to create a "Point Lisas, Trinidad and Tobago" location in the ALOHA model.

Model Parameter	Setting
Location:	Port Lisas
Is location in a US state or territory?	No
Approximate elevation:	33 ft
Approximate location longitude:	61 deg, 28.0 min W
Approximate location latitude:	10 deg, 24.0 min N
Country name:	Trinidad and Tobago
Offset from local STANDARD time to GMT:	4.00 hours
Is current model time standard or daylight savings	Standard

Output includes concentration contour plots and concentrations at specified locations.

All chlorine releases were modelled as dense gas releases. Modelled concentrations are compared to short-term exposure criteria as identified in Section 1.5.6.1, Table 1.5-5 and Table 1.5-6.

1.5.6 Regulatory Standards and Criteria Levels

1.5.6.1 Criteria for Hazardous Material Releases

The proposed chlor-alkali facility would be a potential source of accidental releases of hydrogen chloride (HCl), chlorine (Cl_2) sodium hydroxide (NaOH), and sodium hypochlorite (NaOCl). Table 1.5-5 shows the modelling averaging periods and levels of ambient air concentrations to which the accidental release modelling results have been compared. For the purposes of the accidental release modelling and risk assessment, model averaging periods have been based short-term (hourly) emission rates for each discrete accidental release event. Table 1.5-6 summarizes the applicable Trinidad Permissible Levels and other relevant exposure guidelines.

Table 1.5-5. Applicable Trinidad Permissible Levels and Related Criteria for Hazardous Materials Releases

Hazardous Material	Averaging Period	Permissible Level (Ng/m3)	Basis for Permissible Level
Hydrogen Chloride (HCl)	30-minute	100	Trinidad Air Rules 2005
Hydrogen Chloride (HCl)	1-hour	2,100	California EPA Acute REL
Chlorine (Cl_2)	30-minute	300	Trinidad Air Rules 2005
Chlorine (Cl_2)	1-hour	210	California EPA Acute REL
Sodium Hydroxide (NaOH)	1-hour	8	California EPA Acute REL
Sodium Hypochlorite (bleach)	15-minute	600	TEEL-0

Table 1.5-6. Accidental Release Immediately Dangerous to Life and Health (IDLH) Modelling Thresholds for Hazardous Materials Releases

Hazardous Material	Averaging Period	IDLH Level (mg/m3)	Reference for IDLH
Hydrogen Chloride (HCl)	30-minute	75	http://www.cdc.gov/niosh/idlh/7647010.html
Chlorine (Cl_2)	30-minute	30	http://www.cdc.gov/Niosh/idlh/7782505.html
Sodium Hydroxide (NaOH)	30-minute	10	http://www.cdc.gov/niosh/idlh/1310732.html

1.5.6.2 Trinidad and Tobago Occupational Safety and Health Act Requirements

The Trinidad and Tobago Occupational Safety and Health Act was promulgated into law in 2004 (Republic of Trinidad and Tobago, 2004). Construction and operation of industrial facilities, including the CariSal facility, are subject to the requirements of the Act. The General Duties under the Act include provisions requiring every employer to ensure, so far as is reasonably practicable, the safety, health, and welfare at work of employees (Part II, General Duties, Section 6) and to ensure, so far as is reasonably practicable, that persons other than employees not be exposed to risks to their safety or health (Part II, General Duties, Section 7).

Elements of the Act applicable to employers and employees include provisions to provide so far as is reasonable practicable, a safe working environment and to provide adequate and suitable protective clothing and devices for employees likely to be exposed to risk of injury. Such risks include exposure to air contaminants [Part II Section 6(2)(a-c) and Part IV Section 23(1) and (2)] Provisions must also be made to ensure that hazardous chemicals not be used unless the prescribed requirements of the Act concerning hazard identification, MSDS, and worker instruction and training are met [Part II Section 6(2)(d-e) and 6(4)]. Employers also are required to take all practicable measures to protect employees against exposure to (inhalation of) fumes, dust, steam, or other injurious substances [Part IV Sections 24(1) and 24(2)].

Facility operators must establish a written employee health and safety policy under Section 8(2)(a) and a written emergency plan under Section 8(2)(b). The emergency plan is to be developed based on a risk assessment conducted in accordance with Part IV Section 25(g) of the Act. Part IV Section 25(g) of the Act includes requirements to evaluate risk to the safety and health of employees and persons not under employment arising from construction and operation

of the facility. Under Section 25(g)(3), the significant findings of the risk assessment are to be recorded and any group of employees especially at risk identified.

This QRA document has been prepared to fulfill the requirements of Section 24(g) of the Act. CariSal will develop an emergency plan and employee health and safety plan for the construction, operation, and decommissioning of the proposed facility based on the results of the risk assessment analyses and in accordance with the requirements of the Act. The health and safety plan would address applicable safety and health requirements of the Act including but not limited to personal protective equipment, respiratory protection, ventilation (for dust, fumes, and other injurious materials) hazard communication and training, machinery safeguards, confined space entry, fire protection, and employee health surveillance. Process safety for the proposed facility is described below in Section 2.4. The emergency plan would identify practices and procedures for incident prevention, detection, response, and reporting; employee evacuation procedures; and facility emergency shutdown and restart; and practices and procedures for offsite (public) notification in the event of an incident.

2.0 PROCESS DESCRIPTION

21 PROCESS OVERVIEW

The CariSal Project is to build and operate a chlor-alkali facility and associated infrastructure, including pipelines from suppliers and to customers, at Point Lisas that would use waste brine from DESALCOTT to produce the following products for local and overseas markets:

- Calcium chloride ($CaCl_2$) as 94-percent $CaCl_2$ pellets [65,000 metric tons (MT) /year] and 77-percent $CaCl_2$ flakes (60,000 MT/year);
- Caustic soda (50-percent solution of sodium hydroxide, NaOH) – 93,000 MT/year;
- Hydrochloric acid (36-percent solution of hydrogen chloride, HCl) – 85,000 MT/year; and
- Bleach (12-percent solution of sodium hypochlorite) – 53,000 MT/year

Hydrochloric acid (HCl) is an intermediate product of the bleach production process. A portion (1,280 MT/year) of the HCl produced by the process would be supplied to market, and the remainder of the HCl produced would be used for calcium chloride production. There are future plans for a portion (49,600 MT) of a byproduct of the process, carbon dioxide (CO_2), to be piped to a nearby facility for the production of urea or to another use of CO_2.

During the operations phase, the CariSal facility workforce would number 75 in total: about 40 technical staff (working on a two shift system) and about 35 management, support, and administrative staff working a 5-day, 40-hour week.

Material Safety Data Sheets for the raw materials and products are provided in Attachment 2. Figure 2.1-1 shows a flow diagram of the overall process. Process steps are outlined below in Section 2.2.

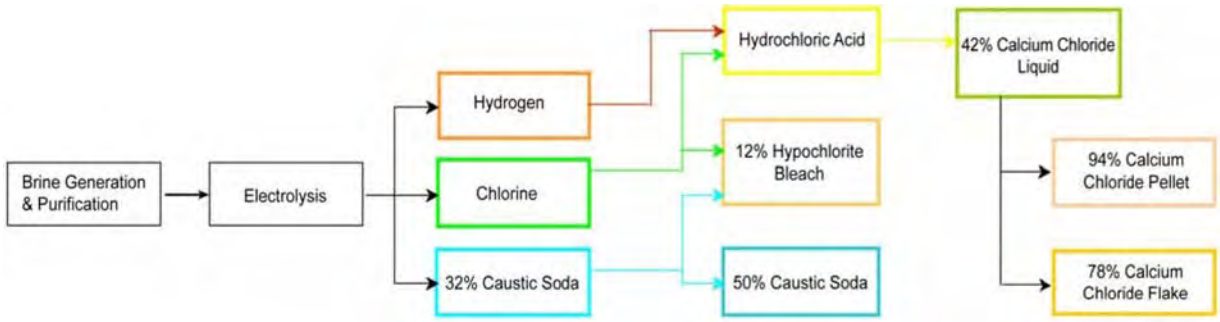


Figure 2.2-1. The CariSal chlor-alkali process.

2.2 Process Steps

CariSal operations would be staged to facilitate safe and smooth startup of the plant. The plan would be to allow production to begin (using solid salt and water) while laboratory and economic evaluations into the long-term viability of using brine from DESALCOTT (a waste product of desalination) are undertaken, and because process equipment for concentrating and purifying DESALCOTT brine would not be available initially. CariSal operations would comprise four stages:

- Stage 1: Production with water from the Water and Sewerage Authority (WASA) and imported "pure" salt (salt containing low levels of impurity)
- Stage 2: Production with brine from DESALCOTT and imported "dirty" salt (cheaper salt containing higher levels than pure salt of impurities such as magnesium chloride, potassium chloride, calcium sulphate, and other naturally occurring salts)
- Stage 3: Production as in Stage 2 but with more brine from DESALCOTT and less dirty salt than in Stage 2
- Stage 4: Production with brine from DESALCOTT (but no imported solid salt) with concentration by newly commissioned mechanical vapour re-compressors

The process steps for each stage are described below.[1] In general, each stage is an extension of the preceding stage.

2.2.1 Stage 1 Process

Step 1: Brine Generation and Purification

Pure, solid salt, imported from a qualified supplier, is mixed with lean brine (recycled from the end of this step) and a small amount of makeup water, piped from WASA, in the salt-saturator unit (EIA Chapter 3, Figure 3.4-1). (At startup, the source of the water to dissolve the salt is WASA, but as the plant reaches a steady state of operations, recycled streams provide the majority of this solvent water, and the proportion of WASA water falls to a small amount of make-up water.) This forms a saturated brine that is then pumped through a series of reaction vessels into which are added soda ash (sodium carbonate, Na_2CO_3), caustic soda (NaOH), and calcium chloride ($CaCl_2$) to cause the impurities in the brine (arising from the salt and consisting of mainly magnesium, calcium, and sulphate, but also heavy metals such iron, aluminium, and chromium) to precipitate out of solution. The precipitated solids sink to the bottom of settling vessels and are removed in a waste brine stream leaving a flow of purified brine to be fed to the electrolyser unit. The solids ("brine muds") are filtered out, dewatered, and sent to a qualified waste disposal contractor. The purified brine is sent to the lean brine tank to be recycled, along with the lean brine from the electrolyser (see Step 2 below) to the front end of this step.

1 For the sake of clarity, the process steps are written in the present tense.

Initially, only one electrolyser (Step 2) and one hydrogen-chloride furnace (Step 3 of Calcium Chloride Production) will be operational. While this is the case, salt is added at a rate of 10 MT/hour. When the second electrolyser comes on line, salt is added at a rate of 30 MT/hour.

Step 2: Membrane Cell Electrolysis

Saturated brine enters the electrolyser unit (EIA Chapter 3, Figure 3.4-2), a vessel comprising 144 electrolytic cells. Each electrolytic cell consists of two chambers separated by a Bichlor™ polymer ion-exchange membrane—the cell membrane—approximately 32 ft^2 (3 m^2) in area. One chamber contains an anode (a positively charged metal rod) and the other, a cathode (a negatively charged metal rod). The saturated brine is fed into the anode chamber where the negatively charged chloride ions present in the brine solution combine at the anode to form chlorine gas.

$$2Cl^- \rightarrow Cl_2 + 2e^-$$

The chlorine gas passes out of the cell to the chlorine coolers.

The positively charged sodium ions and the water molecules migrate through the cell membrane into the cathode chamber. At the cathode, water molecules split to form hydrogen gas and hydroxyl ions (OH^-), which react with the sodium ions to form sodium hydroxide.

$$H_2O + 2e^- \rightarrow H_2 + OH^-$$

$$2OH^- + 2Na^+ \rightarrow 2NaOH$$

The hydrogen gas passes out of the cell to the hydrogen coolers, and the sodium hydroxide in solution is displaced from the cell by the inflow of fresh saturated brine.

The overall chlor-alkali reaction is:

$$2Na^+ + 2Cl^- + 2H_2O \text{ ' } H_2 + Cl_2 + 2NaOH$$

Brine in the cell is continuously replenished by fresh saturated brine. Depleted brine flows out of the cell, is treated with a mixture of hydrochloric acid, sodium bisulphite, sodium hydroxide, and air to remove any dissolved chlorine present as well as any chlorate ions (ClO_3^-) that may have been produced in the electrolytic cell. The brine is then returned to the salt saturation vessel in the previous step.

The electrolytic cell is powered by direct-current (DC) electricity, which is obtained by rectifying alternating-current (AC) electricity.

The caustic production rate is 4,200 MT/month per electrolyser.

After this step, the process splits to produce caustic soda, bleach, and calcium chloride. Quantities in the text below that describes subsequent steps are given on the basis of both electrolysers (and their associated process trains) being in operation.

Step 3 of Caustic Soda Production: Concentration

The sodium hydroxide produced in the electrolyser (Step 2) is in the form of a 32-percent solution in water. Some of this solution (2,000 kg/hr) is removed for use in the production of bleach (sodium hypochlorite, see Step 3 of Bleach Production) or to treat brine depleted through electrolysis. The remainder (17,000 kg/hr) passes through two evaporators that successively increase in concentration to 39 percent and then 50 percent (EIA Chapter 3, Figure 3.4-3) by removing water through evaporation. The latter solution is the end-product, caustic soda. Water removed by evaporation is condensed and sent to the WASA water tank at a flow rate approximately 13.5 m^3/hr.

Step 3 of Bleach Production: Generation

The 32-percent sodium hydroxide solution produced in the electrolyser (Step 2) is continuously fed into the top of a reaction tower. Chlorine gas and chlorinated air (generated by de-chlorination of depleted brine), both also produced in the electrolyser, are continuously fed into the bottom of the tower (EIA Chapter 3, Figure 3.4-4). The rising gases are absorbed into the falling liquid to form bleach, 12-percent sodium hypochlorite solution, which is re-circulated to the top of the tower. Bleach is produced at a rate of up to 150 MT/day. This process step can absorb all chlorine produced under upset or emergency conditions.

Step 3 of Calcium Chloride Production: Generation of Hydrochloric Acid

Chlorine gas and hydrogen gas from the electrolyser (Step 2) are burned together in a graphite-lined furnace (the hydrogen-chloride reactor) with a flame temperature of 2,500 degrees Celsius (°C) (EIA Chapter 3, Figure 3.4-5). Hydrogen is present in a 5-percent excess concentration to ensure complete combustion of chlorine.

$$Cl_2 + H_2 \rightarrow 2HCl$$

The hydrogen chloride gas produced is cooled in the hydrogen-chloride reactor to 30 °C by means of heat exchangers and is absorbed in water to form a 36-percent solution of hydrochloric acid. Some of this acid (540 kg/hour) is taken for internal use (e.g., pH control, removal of chlorate build up in the electrolytic cell). The rest (9,660 kg/hr) is used in the production of 42-percent calcium chloride solution (Step 4). Some of the hydrochloric acid may also be sold locally and to the export market.

Step 4 of Calcium Chloride Production: Generation of 42 -percent $CaCl_2$ solution

Limestone (calcium carbonate, $CaCO_3$) is taken from a covered outdoor stockpile by means of hoppers and conveyors to four reaction vessels. Hydrochloric acid produced in Step 3 is pumped up through the bottom of these reactors (EIA Chapter 3, Figure 3.4-6). As it rises, it "digests" the limestone to produce calcium chloride solution and carbon dioxide.

$$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$$

The acidic (pH 2 – 3) calcium chloride solution accumulates from these four reactors and is neutralised with "milk of lime" made from lime [$Ca(OH)_2$] to form a 42-percent solution of calcium chloride at pH 7 – 8. Every 16 hours the reactor vessels are cleaned to remove

inert material. This material is then handled and disposed of as solid waste. Once production is established, the waste solids will be tested and if benign as expected, used or sold as fill material. The bulk of the carbon dioxide released (49,600 MT/year) is not utilised but vented to the atmosphere, although a small stream (320 MT/year) is combined with caustic soda to make soda ash, which is used to purify brine received from DESALCOTT (Step 1). When the urea plant proposed by another developer becomes operational, the carbon dioxide will be sent to that facility via pipeline. Otherwise, it will be sent to another user of CO_2. CariSal Unlimited will also continuously seek other viable, alternative uses for the carbon dioxide generated in this step of the process, as an interim measure.

If the Caroni option is chosen, some of the 42-percent calcium chloride solution produced will be produced for sale and export as "calcium chloride liquid" and will be piped to a tank at the EISL Industrial Supplies Limited (EISL) site for storage.

Step 5a of Calcium Chloride Production: Production of 94-percent $CaCl_2$ Pellets

The 42-percent calcium chloride solution (from Step 4) is mixed with recovered calcium chloride dust (from this step), and the resulting solution is warmed to 70 ºC and passed into a fluid bed dryer and spray system (EIA Chapter 3, Figure 3.4-7). The droplets formed by the sprayer coat calcium chloride spheres already present in the bed, causing them to grow and fall out of the bed once they have reached a certain size range (2 – 4 mm). These pellets are then screened, cooled, and bagged into flexible intermediate bulk containers (FIBC) and 25-kilo bags.

Step 5b of Calcium Chloride Production Process: Production of 77 percent $CaCl_2$ Flakes

The 42-percent calcium chloride solution (from Step 4) is pumped to a steam-fed pre-heater/concentrator to concentrate the solution from 42 percent to 71 percent (EIA Chapter 3, Figure 3.4-8). The water removed (as vapour) is condensed and sent to the process water tank. The 71-percent solution is poured into a flaker—a drum with a water-cooled surface. The 71-percent solution solidifies into a thin layer when it contacts the cool drum surface. A rotating knife scrapes the thin solid layer onto conveyors that cool and dry the product, making it a 77-percent calcium chloride solid flaked product. The 77-percent flakes are bagged into FIBC and 25-kilo bags.

Production of 77-percent $CaCl_2$ flakes begins once the second electrolyser unit and second HCl furnace are started up.

2.2.2 Stage 2 Process

When the process has been demonstrated to function properly using pure salt in Stage 1, "dirty" salt (i.e., salt that is less expensive than that used in Stage 1 and contains more impurities) will be used as a raw material in the Stage 2 process. The steps of the Stage 2 process are largely the same as those for the Stage 1 process, except for the differences in Step 1, outlined below.

Step 1: Brine Generation and Purification

Approximately 20 MT/hr of "dirty" salt is mixed with brine from DESALCOTT (a 5.3-percent salt solution) and brine recycled from this step (Figure 2.2-9). The resulting brine stream is then

purified as in Step 1 of Stage 1. The higher content of impurities in the dirty salt (compared to the pure salt) means that a greater quantity of brine muds is produced.

2.2.3 Stage 3 Process

In the Stage 3 process, the proportion of dirty salt is decreased (to 15 MT per hour) and the proportion of DESALCOTT brine increased such that demineralised water is generated by the process. This water is piped to WASA for its use. Step 1 now incorporates a salt crystalliser as follows:

Step 1: Brine Generation Purification

A purified brine stream is produced as in Step 1 of Stage 2 and passed through the crystalliser to produce solid salt (EIA Chapter 3, Figure 3.4-10). Liquid from the crystalliser is recycled to the front of the process. The solid salt is fed to the salt saturator where it is mixed with recycled lean brine to produce a saturated brine, which is then passed to the electrolyser.

2.2.4 Stage 4 Process

In the Stage 4 process, no imported solid salt is used, only DESALCOTT brine. Concentration of the brine is performed by newly commissioned mechanical vapour recompressors (or, alternatively, by steam-driven evaporation). Step 1 is now as follows:

Step 1: Brine Generation, Purification and Concentration

The brine stream is purified as in Step 1 of Stage 3 and then steam-heated in a series of three closed mechanical vapour recompressor vessels to drive off water and thus concentrate the brine (EIA Chapter 3, Figure 3.4-11). The water vapour driven off from the first stage is compressed to a higher pressure and temperature using mechanical compression and used to drive the second and third stages of evaporation. Upon exiting the third-stage evaporator, the brine stream (now a salt slurry) will be centrifuged to produce solid salt. The liquid from the slurry, "centrate" is recycled to the front of the process. The solid salt is fed into a salt saturation tank where it is mixed with recycled lean brine to produce saturated brine, which is then fed to the electrolyser.

If the Trinidad Energy Investments Limited (TEIL) urea plant comes on stream around 2011 as planned, 49,600 MT of carbon dioxide released in the generation of 42-percent calcium chloride solution (Step 4) (29 percent of the carbon dioxide generated by the plant) will be piped to the TEIL plant. Otherwise, another user of CO_2 would be found.

2.3 Process Intermediate and Product Storage

The hazardous substances that would be stored at the facility in a fluid state are caustic soda (solutions ranging in concentration from 32 percent to 50 percent); bleach (12-percent solution); and hydrochloric acid (36-percent solution). There would also be small system inventories of chlorine gas and hydrogen gas, so those hazardous substances are also considered here.

2.3.1 Chlorine (Cl_2)

Chlorine gas would be generated in the electrolysers when brine is electrolysed into chlorine gas, hydrogen gas, and sodium hydroxide (Step 3). At the CariSal facility, chlorine gas would be present in the electrolysis cells (47 lbs or 21.4 kg in each of two units, for a total of 94 lbs or 42.8 kg) and the piping from the cells to the hydrogen chloride production units, estimated to be approximately 104 lbs or 47 kg, for an estimated total system inventory of approximately 198 lbs 90 kg at any time.

Chlorine would not be handled by employees or stored or otherwise allowed to accumulate in the plant. Approximately 1.5 g/hr (0.0034 pounds/hr) of chlorine gas would be emitted from the process via the caustic scrubbers into the atmosphere, where it would dissipate. Workers would not be exposed to concentrations of chlorine gas above the recommended thresholds (i.e., per Occupational Health and Safety Administration [OSHA]). CariSal would also develop its environmental health and safety management plan in compliance with the Trinidad and Tobago Occupational Safety and Health Act 2004 and 2006 Amendment with regard to ensuring workplace safety.

2.3.2 Hydrogen (H_2)

Hydrogen gas would be generated in the electrolysers when brine is electrolysed into chlorine gas, hydrogen gas, and sodium hydroxide (Step 3). At the CariSal Unlimited facility, hydrogen gas would be present in the electrolysers (1.3 lbs or 0.6 kg in each of two units, for a total of 2.6 lbs or 1.2 kg). It would also be present in the piping from the cells to the hydrogen-chloride production units and to the hydrogen vent stack via the hydrogen-chloride scrubber, estimated to be approximately 6 lbs or 2.8 kg. The estimated total system inventory would be 5.6 lbs or 2.6 kg at any time.

Hydrogen would not be handled by employees or stored or otherwise allowed to accumulate in the plant. Approximately 27 kg/hr (60 pounds/hr) of hydrogen gas would be emitted from the process via the hydrogen vent stack and via the hydrogen-chloride scrubber into the atmosphere, where it would dissipate.

2.3.3 Caustic Soda (NaOH Solution)

Including the proposed shore tank at the EISL facility (or the two retrofitted tanks at the adjacent Caroni facility), caustic soda would be stored in six (or seven) bunded tanks. The tank design would include pressure/vacuum relief valves at the top, in accordance with the relevant American Petroleum Institute (API) standard for atmospheric pressure storage.

- Receiver tank: 10 feet (ft) by 27 ft (3.05 m by 8,235 m), holding 15,854 gal (60 m^3),
- Four intermediate storage tanks: each 12 ft in diameter by 24 ft tall (3.66 m by 7.32 m) and holding 81,000 gal (307 m^3) each, and
- EISL facility storage tank: 84 ft in diameter and 60 ft tall (25.6 m by 18.3 m), holding approximately 2,488,320 gals (9,419 m^3).
- Or two retrofitted tanks at Caroni site, each 84 ft in diameter and 54 ft tall (25.6 m by 16.5 m), capacity 2,239,490 gal (8,477 m^3)

The receiver tank would be used to store (intermediate) 32-percent caustic soda; the other tanks would be used to store (product) 50-percent caustic soda. The amount of caustic soda product stored would be 2,569,000 gal (9,726 m^3), but total caustic soda storage capacity would be approximately 2,828,000 gal (10,710 m^3) with the EISL option or 4,819,000 gal (18,240 m^3) with the EISL option.

2.3.4 Bleach [Sodium Hypochlorite (NaOCl) Solution]

Before storing, the product would be cooled to enable storage at ambient temperatures, thus avoiding the necessity of a scrubbed vent. Bleach would be contained in six bunded tanks:

- Two receiver tanks: each 5 ft in diameter by 24 ft tall (1.52 m by 7.32 m) with a resulting maximum capacity of 3,526 gal (13.35 m^3) each; and
- Four storage tanks with a capacity of 45,000 gal (170.3 m^3) each, which is the maximum volume generated from four days of production.

Total bleach storage would be approximately 183,000 gal (692 m^3); total storage capacity would be approximately 187,000 gal (708 m^3).

2.3.5 Hydrochloric Acid (HCl)

Hydrochloric acid would be stored in six bunded tanks:

- One internal storage tank 10 ft in diameter by 14 ft tall (3.05 m by 4.26 m) holding 5,878 gal (22.2 m^3) of hydrochloric acid;
- Four hydrochloric acid receivers, each 12 ft in diameter by 24 ft tall (3.66 m by 7.32 m) holding 20,312 gal (76.9 m^3); and
- One product storage tank 42 ft in diameter by 40 ft tall (12.8 m by 12.2 m) holding 400,000 gal (1,514 m^3).

Total hydrochloric acid storage would be approximately 408,400 gal (1,546 m^3); total storage capacity would be 489,393 gal (1,853 m^3).

2.4 Process Safety

CariSal's safety philosophy comprises the following elements:

- Inherently safe process design,
- Strategically placed instrumentation,
- On-going operator training/ testing,
- Safety interlocks,
- Physical and mechanical safety devices, and
- Emergency systems.

Contractors as well as employees would be required to undergo training to obtain necessary certification regarding safety performance standards.

Critical process systems, emergency trip systems, chlorine area monitoring, strategic control valve failure positions, and emergency power systems have been incorporated into the CariSal facility design in order to make the process inherently safe. All pipes, fittings, and valves would be designed to a minimum design pressure of 100 psi @ 149 °F and would conform to ASME Process Piping Code. Chlorine piping would be designed in accordance with the Chlorine Institute Chlorine Manual and Chlorine Institute Pamphlets (CariSal Limited 2007, The Chlorine Institute 2000).

Instrumentation would be provided at key locations in the process to enable operators to monitor critical plant parameters. A thorough process-training programme (with qualification testing) would ensure that operators have the knowledge to use this process information to avoid unsafe operating conditions.

Hazardous-gas monitors for chlorine, hydrogen, and hypochlorite would be located at strategic locations throughout the plant. These locations include the HCl synthesis area, brine dechlorination area, and cell room as shown in Figure 3.4-13 in Attachment 3 to this QRA. Additionally, one hypochlorite monitor will be added to the design and placed in an appropriate location.

A safety and interlock system would continuously monitor all critical operating parameters and take corrective action before hazardous conditions could develop. Chlorine and hydrogen gas analyzers would be installed in the cell room to detect possible releases. Typical interlock actions would be the shut down of pumps, fans, and other plant equipment; the opening or closing of control valves; and initiation of process purge streams. Before the interlock action took place, an alarm would sound on the distributed control system (DCS) warning the operator that the process parameter had deviated from the normal operating range. Emergency plant shut down would be initiated in the event of detection of high concentration limits of H_2 or Cl_2 by the analyzers. The hypochlorite unit would be designed to be capable of absorbing 100 percent of the chlorine produced in the cell room for a period of 10 minutes in the event of an emergency shut down (CariSal Limited 2007).

The plant would be equipped with a nitrogen purge gas system that would activate in the event of an emergency shut down to vent hydrogen from process equipment to the hydrogen stack and also equipped with a dry air purge gas system to vent chlorine from process equipment to the hypochlorite unit. Nitrogen would also be consumed during normal plant start up and shut down and also as a process purge gas. Onsite nitrogen storage capacity would be sufficient for a plant shut down period of two to three days (CariSal Limited 2007).

Safety devices such as liquid seals and dikes would provide backup if the process were to develop a hazardous condition. Overflow lines for hazardous liquid storage vessels would terminate into purged seal pots to minimize the release of hazardous vapours (CariSal Limited 2007). Dike or containment walls and sumps have been designed to avoid the mixing of incompatible chemicals.

Operators would be required to wear personal protective equipment, including escape respirators, and safety gear to protect against chemical exposure (CariSal Limited 2007). Self-contained breathing apparatus and chlorine masks would be located at the entrances to the cell room, hypochlorite unit, and other locations for use in emergency situations. Safety showers would be located at strategic locations throughout the plants. The safety showers would be equipped with local flashing lights and remote indication in the DCS, activated on use of the shower. CariSal contractors and all visitors to the CariSal facility would be provided with health and safety training as a condition of entry. Contractors would be required to follow health and safety procedures applicable to their specific work location. Visitors to the CariSal facility would not generally be permitted to enter areas of the facility (e.g., the cell room) where personal protective equipment would be required. Any visitors for which such entry is required would be trained in the use of and provided with the personal protective equipment specific to the areas of entry.

Portable fire extinguishers would be provided in areas of the plant including production areas. Carbon dioxide extinguishers would be provided in the control room and master control centre (MCC) room to extinguish any electrical fires. In addition a firewater ring line would be provided. A firewater pump and firewater jockey pump would deliver water to the firewater stations and to the sprinkler systems in the buildings.

Critical instruments would be hard-wired to a separate panel. These instruments would provide continuing operation during an emergency, for example, loss of main electrical power or DCS.

3.0 PHYSICAL SETTING

This section discusses only those elements of the physical setting that have a bearing on the Risk Assessment. Other elements of the physical setting, such as topography, geology and soils, or surface water and hydrology, are discussed in Chapter 4 of the Environmental Impact Assessment.

3.1 SITE BOUNDARY AND VICINITY

3.1.1 Proposed CariSal Facility

The proposed CariSal site would be located on a parcel of land, 11.8 ha in size, which CariSal would lease from the National Energy Corporation of Trinidad and Tobago Limited (NEC). Though currently undeveloped, this parcel lies adjacent to the PLSEIE in Couva and is designated as industrial land. Its geographical coordinates are 10°24′ North and 61°28′ West.

The Project site was used historically for the intensive monoculture of sugar cane; intermittent human settlements developed around the sugar industry. Since the 1970s, land use within the wider Couva area has been gradually converted from agriculture to industrial and residential uses. The predominant land uses within the 5-kilometre (km) area around the proposed plant include agriculture, heavy and light industry, and some residential; the area is generally built-up (Ministry of Agriculture 1994).

The land where the proposed site is located is relatively flat to gently undulating, with a general slope from east to west; the central and northern portions are the lowest elevation. To support sugarcane cultivation, the slope of the land was altered to promote drainage along specific routes. Since the 1970s, land use within the wider Couva area has been gradually converted from agriculture to industrial and residential uses. No residential areas are within the 11.8-ha property proposed by CariSal. No structures are currently on the site, nor is there any evidence of previous structures on the site. Overhead electrical power lines run along the southern boundary of the site. No lakes or major watercourses occur on the Project site, but a wetland area is present along the site′s western edge.

3.1.2 Other Existing and Proposed Facilities in Vicinity

Industrial operations in the vicinity of the proposed CariSal facility, pipeline ROW, and transportation routes are listed in Table 3.1-1. The locations of these facilities are shown in Figure 3.2-1 in Attachment 3 to this QRA. Table 3.1-1 also shows the number of employees at each facility during normal working hours (daytime) and outside of normal working hours (night time). Populations of workers onsite at industrial facilities in the vicinity of the CariSal facility, pipeline ROW, and transportation routes are considered in the individual risk and societal risk calculations, in addition to the resident population.

In addition to the existing facilities in the vicinity of the proposed CariSal facility, there are also proposals to construct the PLSEIE and to build a Port at Claxton Bay North, although the EIA for these facilities are not publicly available at the time of this report. If the PLSEIE and the Port

at Claxton Bay North are built, workers at these facilities would be within the area of evaluation of individual and societal risk for the proposed CariSal facility. The number of workers potentially associated with the operation of each of these developments is not yet known, as the tenant facilities will need to obtain separate licenses to operate, and they have not yet applied for these licenses.

Table 3.1-1 Neighbouring Industrial Operations

No.	Facility Name	Facility Activity	Normal Working Hours	Outside Normal Working Hours
1	Phoenix Park Gas Processors Ltd.	Natural gas	170	15
2	Yara Trinidad Limited, formerly Hydro Agri Trinidad Limited	Ammonia	240	40
3	Industrial Gases Limited	Oxygen, Acetylene	65	4
4	Petrotrin Compressor Station	Natural gas	2	0
5	ANSA McAl Ltd.	Chlorine	50	6
6	National Agro Ltd.	Fertilizer	12	1
7	Trinidad Salt	Food-grade salt	10	1
8	Aerogas Limited	Aerosol gas	4	2
9	CNC Ammonia	Ammonia	75	12
10	Titan Methanol	Methanol	75	12
11	Atlas Methanol	Methanol	75	12
12	DESALCOTT	Desalination of sea water	60	10
13	Northern Construction	Concrete and aggregate batch plant	200	5
14	Miscellaneous Work Shops	2 machine shops	500	50
		2 valve repair shops		
		Pipe and steel structures fabrication shops		
		Cranes and other mobile		
		Equipment storage and maintenance yard		
		Total:		
15	Universal Foods	Food	40	10
16	ESCO		32	2
17	L.J. Williams		25	3
18	Caroni Ltd.		40	2
19	AUM Complex		40	2

Normal hours are 7 a.m. to 7 p.m., except for the Yara Trinidad Ltd. facility, where people work three shifts from 7 a.m. to 3 p.m., from 3 p.m. to 11 p.m., and 11 p.m. to 7 a.m.

3.2 Site and Process Equipment Plot Plan

The plot plan for the CariSal site is shown in Figure 3.2-2a in Attachment 3 to this QRA. The plot plan shows where the facility process equipment is located in relation to the CariSal site boundary.

3.3 Product Truck Transportation Routes

Product truck transportation routes are shown in Figure 5.1-1 in Attachment 3 to this QRA. Access to the CariSal site would be by way of Pacific Avenue and Southern Main Road. Product

hydrochloric acid would be transported by tank truck from the CariSal site to customers. Product hypochlorite (bleach) would be transported by tank truck from the CariSal site to Savonetta Pier #4.

3.4 Pipeline Route and Offsite (ex-situ) Facilities

Offsite (ex-situ) facilities and infrastructure would consist of the pipelines (listed in Table 3.4-1), and a caustic soda storage tank (capacity 2,488,320 gal or 9,419 m^3) on the existing EISL site and Yara pier (which EISL would manage), as well as the (partly onsite) connections to the electricity, water, and communications grids. CariSal is also considering an option to use this tank on the EISL site for storing the 42-percent calcium chloride solution and storing the caustic soda in two existing single-walled bunded tanks (each of capacity 2,239,490 gal or 8,477 m^3) on the Caroni site adjacent to the EISL site, until now used for the storage of molasses. This option, the "Caroni option," would entail upgrading and using an existing carbon steel pipeline (previously used for transporting molasses between the Caroni site tanks and the Yara pier), as well as the construction of a pipeline between CariSal and the Caroni site tanks. The caustic pipeline ROW, EISL facility, and offsite caustic tank locations are shown in Figure 3.4-1. The location of the tie-in from the offsite NGC natural gas utility pipeline and the natural gas metering station on the CariSal site is shown in Figure 3.4-2.

Table 3.4-1 Offsite Pipelines

Pipeline	From/To	Diameter	Length (meters)	Constituent Material
Brine (Feed)	DESALCOTT to CariSal	20 cm (8 inch)	1,500	High density polyethylene (HDPE)
Caustic Soda (Product)	CariSal to EISL	15 cm (6 inch)	2,000	Carbon steel
Caustic Soda (Product)	EISL to Yara pier	15 cm (6 inch)	300	Carbon steel
Carbon Dioxide (Product)	CariSal to TEIL (scheduled for operation in 2011) or another user of CO_2	10 – 15 cm (4 – 6 inch)	1,750	HDPE
Natural Gas (Utility)	From the NGC pipeline alongside the site to calcium chloride fluid bed dryer	10 – 15 cm (4 – 6 inch)	50	Carbon steel
Potable Water (Utility)	From the WASA utility line alongside the site to administrative building	10 cm (4 inch)	50	HDPE
Demineralised Water	CariSal to WASA system along the route of the brine (feed) pipeline	20 cm (8 inch)	1,500	HDPE
Should the Caroni option be chosen, the pipelines among CariSal, EISL, and the Yara pier will carry 42-% calcium chloride solution, and the following two additional pipelines will be required.				
Caustic Soda (Product)	CariSal to Caroni	15 cm (6 inch)	2000	Carbon steel
Caustic Soda (Product)	Caroni to Yara pier (existing – pipeline to be upgraded)	15 cm (6 inch)	300	Carbon steel

Figure 3.4-1. Caustic pipeline right-of-way and EISL facility storage tank study area.

3.4.1 Caustic Pipeline Right-of-Way

CariSal would construct and operate a pipeline from the CariSal facility to the EISL facility caustic storage tank to transport caustic. The pipeline would be 6 inches (15 cm) in diameter and approximately 2,000 m long. The ROW for the caustic pipeline is shown in Figure 3.4-1.

3.4.2 River and Road Crossings

River and road crossings associated with the proposed pipeline ROWs are illustrated in Figure 3.2-1 in Attachment 3 to this QRA.

3.4.3 Natural Gas Pipeline Tie-in Right-of-Way

CariSal would be making a 6-inch (1 5-centimetre) minimum or 8-inch (20-centimetre) maximum diameter tie-in to the existing NGC 24-inch (61-centimetre) Residue Gas Header to supply natural gas to the CariSal site via a metering station on the CariSal site. The line length from the NGC 24-inch pipeline to the metering station on the CariSal site is anticipated to be approximately 20 m.

3.5 METEOROLOGICAL SETTING

In general, the climate and meteorology of the Caribbean Region including Trinidad is described as Tropical Marine, which is characterized by the uniformity of its high temperature throughout the year. Data from national sources were used to provide a general description of the climate, and when available, more localized data were used. Climate is described in terms of the following categories: wind, rainfall, temperature and relative humidity, and tropical storms and hurricanes. The Project should have no effect on climate conditions.

3.5.1 Wind Speed and Direction

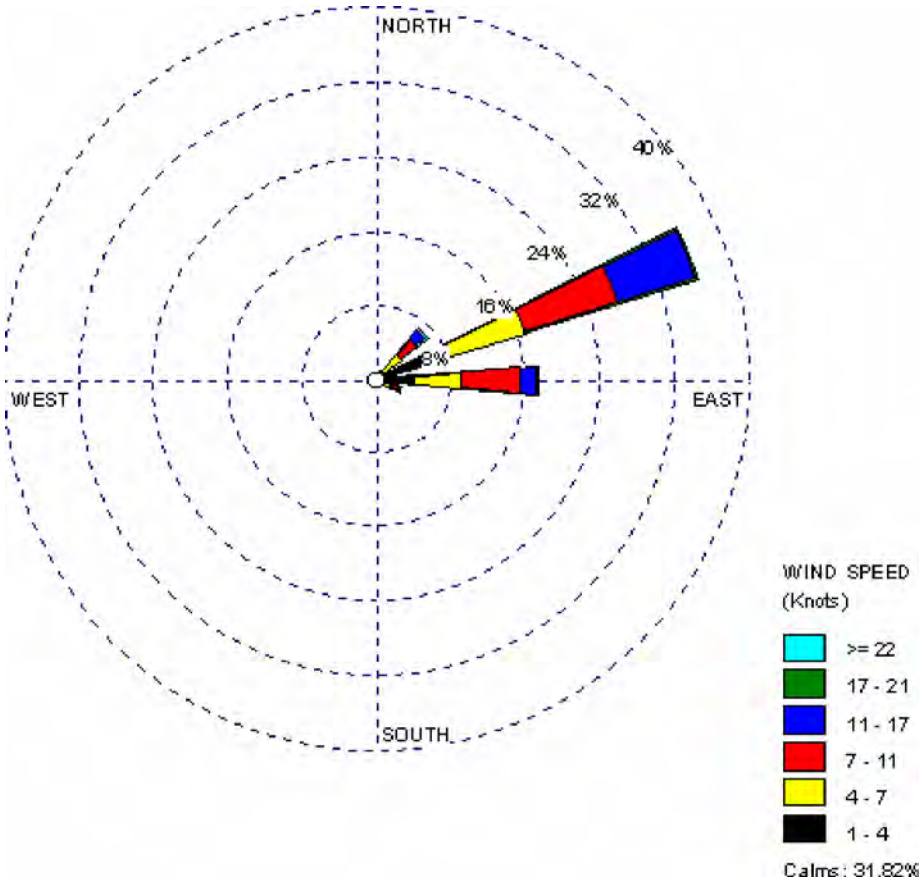
Although a long period of wind data is not available for Point Lisas, data from the International Piarco Airport provide general characterizations of the wind flow pattern for Trinidad. Data collected from the Piarco International Airport show that overall wind speeds in Trinidad typically range from calm[2] to 10.3 metres per second (m/s) during both the dry and wet seasons. Wind speed tends to vary seasonally, with higher speeds observed more frequently during the dry season. Calm conditions are recorded at Piarco about a quarter of the time during the dry season and more than a third of the time during the wet season. Easterly/north-easterly winds are common about a third of the time in the dry season. In the wet season, easterly winds dominate (approximately 24 percent of the time).

For most of the year, Trinidad is under the influence of the northeast trade winds. However, from August through October, the southeast trade winds predominate over the southern portion of the island as the Intertropical Convergence Zone (ITCZ) moves farther north (see Section 3.5.1.2).

3.5.1.1 Wind Rose Data

The wind rose for Piarco Airport for the period 1995 to 2004 is shown in Figure 3.5-1. More recent data are available from EMA as collected from their air quality and meteorological monitoring site located in Point Lisas, which is located about 4.1 km north-northwest of the Project site. Wind roses from the EMA monitoring site at Point Lisas are shown in Figures 3.5-2 and 3.5-3 for 2005 and 2006, respectively. These two sites show the same consistent wind pattern. However, unlike Piarco, both stations show a pronounced southeast wind component. Calm winds occur about 22-23 percent of the time. The wind pattern found at the EMA site is most representative of the Project site.

2 Calm – wind speeds less than 0.5 m/s



Source: Trinidad and Tobago Meteorological Services

Figure 3.5-1. Wind rose at Picaro Airport, 1995 to 2004.

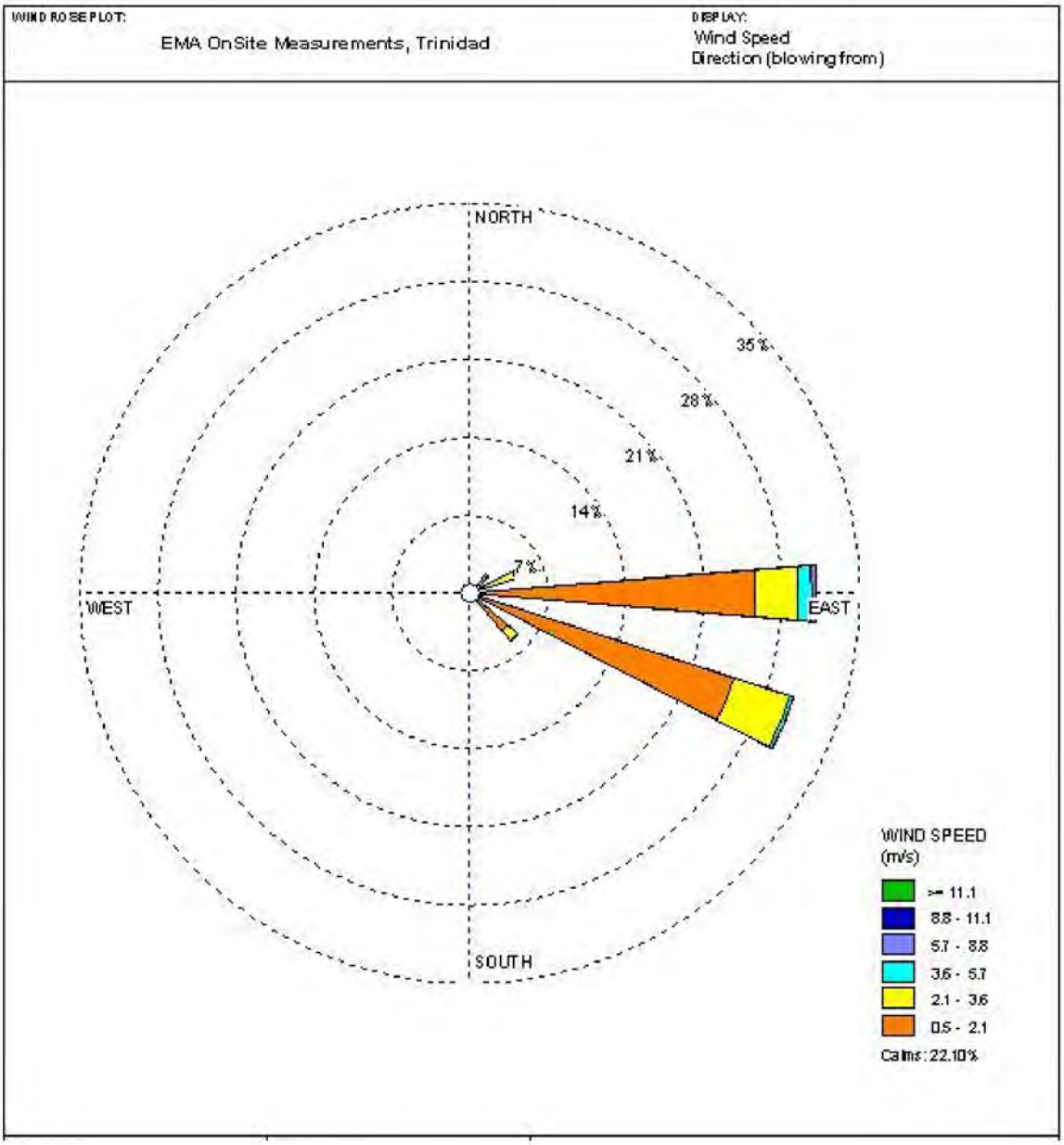


Figure 3.5-2. Wind rose at the EMA monitoring station at Point Lisas, 2005.

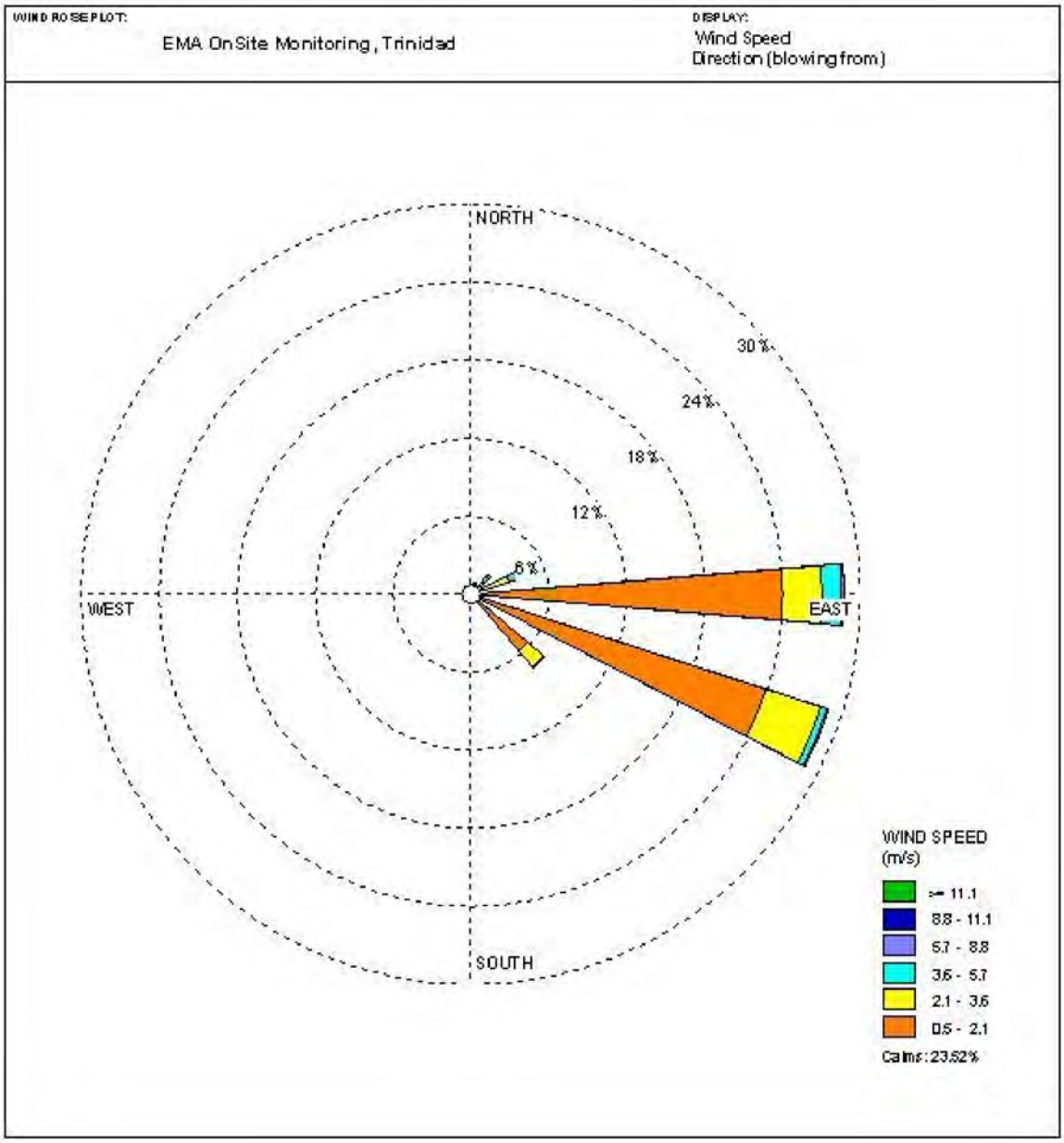


Figure 3.5-3. Wind rose at the EMA monitoring station at Point Lisas, 2006.

3.5.1.2 Wind Direction Probabilities

The more southeasterly wind flow pattern August through October is evident in the wind data collected for the Caroni Research Station at Waterloo, located approximately 7 km to the northwest of the proposed site location shown in Tables 3.5-2 and 3.5-3. Although these data were collected only during the months of May to December 1993 and January to April 1994, they can be used to delineate the expected wind flow pattern at the Project site given its close proximity.

Table 3.5-2. Wet Season Wind Data (%): Wind Rose Point Lisas Wet Season (2005-2006) Based on EMA's Point Lisa's Meteorological Data (Source: Meteorological Office)

Wind Direction	5.00E-01 – 1.00E+00	1.00E+00 – 2.00E+00	2.00E+00 – 3.00E+00	3.00E+00 – 4.00E+00	4.00E+00 – 5.00E+00	5.00E+00 – 1.00E+02	Total Obs.	Percent
0	31	64	3	0	0	0	98	1.11%
22.5	34	30	0	0	0	0	64	0.72%
45	246	29	0	0	0	0	275	3.11%
67.5	1208	206	0	0	0	0	1414	16.01%
90	1960	873	114	0	0	0	2947	33.37%
112.5	747	1085	211	0	0	0	2043	23.13%
135	195	385	102	0	0	0	682	7.72%
157.5	90	123	18	0	0	0	231	2.62%
180	36	72	5	0	0	0	113	1.28%
202.5	8	31	10	0	0	0	49	0.55%
225	5	18	7	0	0	0	30	0.34%
247.5	6	20	1	0	0	0	27	0.31%
270	4	16	2	0	0	0	22	0.25%
292.5	6	5	3	0	0	0	14	0.16%
315	6	5	0	0	0	0	11	0.12%
337.5	24	76	20	0	0	0	120	1.36%
Total	4606	3038	496	0	0	0	8140	
CALM OBSERVATIONS							692	7.84%
TOTAL OBSERVATIONS							8832	100.00%

Table 3.5-3. Dry Season Wind Data (%): Wind Rose Point Lisas Dry Season (2005-2006) Based on EMA's Point Lisa's Meteorological Data (Source: Meteorological Office)

Wind Direction	5.00E-01 – 1.00E+00	1.00E+00 – 2.00E+00	2.00E+00 – 3.00E+00	3.00E+00 – 4.00E+00	4.00E+00 – 5.00E+00	5.00E+00 – 1.00E+02	Total Obs.	Percent
0	26	58	18	0	0	0	102	1.17%
22.5	47	29	0	0	0	0	76	0.87%
45	315	53	3	0	0	0	371	4.27%
67.5	1087	303	10	0	0	0	1400	16.11%
90	1553	1048	268	1	0	0	2870	33.03%
112.5	619	1324	765	4	0	0	2712	31.22%
135	79	240	212	2	0	0	533	6.13%
157.5	21	34	15	1	0	0	71	0.82%
180	6	11	1	0	0	0	18	0.21%
202.5	1	2	0	0	0	0	3	0.03%

Table 3.5-3. Dry Season Wind Data (%): Wind Rose Point Lisas Dry Season (2005.2006) Based on EMA's Point Lisa's Meteorological Data (Source: Meteorological Office)

Wind Direction	5.00E-01 – 1.00E+00	1.00E+00 – 2.00E+00	2.00E+00 – 3.00E+00	3.00E+00 – 4.00E+00	4.00E+00 – 5.00E+00	5.00E+00 – 1.00E+02	Total Obs.	Percent
225	0	3	0	0	0	0	3	0.03%
247.5	1	1	0	0	0	0	2	0.02%
270	3	2	0	0	0	0	5	0.06%
292.5	3	2	1	0	0	0	6	0.07%
315	4	6	1	0	0	0	11	0.13%
337.5	11	75	64	0	0	0	150	1.73%
Total	3776	3191	1358	8	0	0	8333	
CALM OBSERVATIONS							355	4.09%
TOTAL OBSERVATIONS							8688	100.00%

More recent data are available from EMA's air quality and meteorological monitoring station in Point Lisas. The station is located about 4.1 km north-northwest of the Project location and is the most representative, recent longitudinal data for the Project site. Wind roses at Point Lisas are shown as Figures 3.5-2 and 3.5-3 for 2005 and 2006, respectively. The Waterloo and EMA stations show the same consistent wind pattern.[3] However, unlike at Piarco, both stations show a pronounced southeasterly wind component. Calm winds occur about 22-23 percent of the time. Wind data was recorded at the Project site during air quality monitoring from October 26, 2007 until December 2, 2007.

CariSal acquired the EMA wind data for this same time period, however, during the early part of the period when the EMA meteorological monitoring system was down. Beginning November 4, 2007 hour 18, the EMA data recommenced operations. A total of 692 hours was available for a comparison between the CariSal wind data and the EMA wind data. The mean wind speed (0.9 m/s) over the period was the same for both EMA and for the Project site. However, the speed distribution was different with EMA having 88 percent of all wind speeds less than 2.0 mps while the Project site had only 70 percent. Wind directions also showed some small differences with the EMA site having a prevailing wind direction from the east or east-southeast for about 67 percent of all hours, while the Project site had prevailing winds from the east-northeast or northeast for about 37 percent of all hours. These differences are likely due to differences in the monitoring heights (3 m for CariSal and 10 m for EMA) along with the 4.1-km difference in location.

3.5.2 Hurricanes and Tropical Storms

The Point Lisas area, and Trinidad as a whole, periodically experience extreme weather events. These events are associated with tropical storms that can produce extremely strong winds or heavy rainfall amounts or both. For example, in 1974 the recorded wind speed at Point Lisas during Tropical Storm Alma was 151 kilometres per hour (km/h) (Trinidad and Tobago Meteorological Service 2001). Also, from 1970 to 2006, the paths of 17 tropical storms have

3 The Point Lisas wind rose does not show westerly winds because the duration of the westerly winds recorded within any one of the seven westerly wind directions measured does not sum to one percent or more.

passed close to Trinidad.[4] Two tropical storms, Fran and Alma, have passed over the island. In September 2004, rain associated with Hurricane[5] Ivan caused serious flooding in St. Helena, Piarco, Caparo, and Kelley. These villages are located well north of the proposed Project site.

Table 3.5-4. Tropical Cyclones Affecting Trinidad and Tobago (1974 – 2005)

Name or Number (For Year)		Date of Passage	Classification	Area of Centre of Passage
Alma	4	1974 Aug 14	TS	Southern Trinidad
Greta	8	1974 Aug 14	TS	70 km N of Trinidad
Cora	4	1978 Sept 13	TS	30 km WNW of Port of Spain
Danielle	4	1986 Sept 8	TS	90 km NE of Tobago
Joan	11	1988 Oct 14	TS	70 km N of Tobago
Arthur	1	1990 Jul 25	TS	Tobago
Fran	6	1990 Aug 13-14	TS	Southern Trinidad +
Bret	2	1993 Aug 4-9	TS	Northern Trinidad +
Joyce	10	2000 Oct 1	TS	Tobago +
Chantal	3	2001 Aug 16	TS	Northern Tobago**
Jerry	10	2001 Oct 7	TS	Northeast of Tobago**
Isidore	9	2002 Sept 14-27	TS	West of Trinidad
Lili1	2	2002 Sept 21	TS	Northeast of Tobago
Claudette	3	2003 Jul 8-17	Dep.	Northern Tobago
Frances	4	2004 Aug 24	TS	Northern Tobago
Ivan	4	2004 Sept 7	H	Tobago+
Dennis		2005 Jul 8	H	
Emily	2	2005 Jul 13	H	Northern Tobago*

Key: TS = Tropical Storm, H = Hurricane

+ Cyclones which have made landfall

** Tropical storm warning for Tobago

* Tropical storm warning for Trinidad and Tobago.
Source: Meteorological Office/NEMA 2001)

3.6 Background Air Quality Data

3.6.1 Ambient Air Quality Measurement

The EMA has collected the best available long-term ambient air quality data in the vicinity of the Project, that is, the PLIPDECO area. This EMA monitoring station is located about 4.1 km north-northwest of the Project site. CariSal has obtained and summarized these data below. In addition, CariSal conducted onsite ambient air monitoring for roughly a one-month period from late October 2007 to December 2, 2007 for these same pollutants monitored by EMA and others that the proposed plant would emit. Together, these data establish the current ambient background concentration levels in the vicinity of the Project. The other air pollutants that were monitored include total suspended particulate (TSP), particulate matter with a mean mass diameter less than 2.5 micrometres (µm, or $PM_{2.5}$), hydrogen chloride (HCl) gas, and chlorine (Cl_2) gas.

4 Close refers to passing through the geographical area bounded by Latitude 10EN to 12EN and Longitude 69EW to 62EW (National Oceanic and Atmospheric Administration Coastal Services Center)

5 Hurricanes are tropical storms that have sustained winds in excess of 119 km/h.

The EMA's monitoring effort began in October 2004 at the Point Lisas Industrial Estate, which at the time comprised a mix of petrochemical and steel plants, medium-sized manufacturers, and smaller service companies. Ambient air measurements monitored at the site include carbon monoxide (CO), sulphur dioxide (SO_2), ground-level ozone (O_3), nitrogen dioxide (NO_2), and meteorological parameters. Monitoring for particulate matter with a mean mass diameter less than 10 µm (PM_{10}) began in March 2006. Data provided by EMA have been reported through early July 2007 and for October 30 through December 2, 2007.

The EMA data were reviewed and analyzed to determine how they compare with the proposed Trinidad Air Pollution Rules. The review and assessment revealed the following issues with the data.

3.6.1.1 CO Measurements

1. Before October 5, 2005, the baseline trend of values was constantly negative during three periods, before the instrument was reset. These three periods were: October 1, 2004 through February 13, 2005; February 14 through April 26, 2005; and April 27 through October 5, 2005. This type of error is common with laser measurements that do not account for degradation of the initial beam due to aging. Thus these data were corrected by determining the long-term average slope (negative, in these cases) of the raw values in each period and subtracting the trend from the raw measurements.
2. During the period from December 11, 2005 at 1500 hours through January 14, 2006 at 1600 hours apparent problems with the instrumentation were noted, possibly due to the instrument's being offline. Reported values were constantly small and negative during this period and were corrected at the end of the period. These values were removed from the analysis.

3.6.1.2 PM_{10} Measurements

A calibration problem appears to have developed because the values increased toward the end of the data period and increased very rapidly during late June and early July 2007. A root cause for these increases could not be clearly identified in conversation with EMA staff, nor could we determine the period where the error clearly begins. Based on the widely fluctuating hour-to hour PM_{10} values measured for the period, the data for June 24, 2007 at 2000 hours through June 6, 2007 at 0100 hours and June 30, 2007 at 2100 hours through July 7, 2007 at 0300 hours were therefore removed from the analysis.

3.6.1.3 NO_2 Measurements

NO_2 measurements showed little variation in hour-to-hour measurements except for one hour on August 4, 2006 at 1100 hours when a 1-hour concentration of 157.4 micrograms per cubic metre (µg/m^3) was reported, while the hours preceding and following were only 1 and 37 µg/m^3 and the second highest 1-hour value over this 2.5-year monitoring period was only 37.4 µg/m^3. This single hour jump in measurement is unusual and likely to be the result of contamination or possibly instrument malfunction and was removed from the analysis.

The remaining air quality data provided, collected, and reported by EMA were used for the analysis. A comparison of EMA's monitored values with the proposed Trinidad and Tobago Air Pollution Rules is shown in Table 3.6-1. Maximum measured values are compared with the permissible levels; the relative fraction of the permissible level is summarized. Most values are less than half of the draft permissible levels prescribed in the draft Air Pollution Rules. Three concentrations were more than half of the permissible values. The maximum 1-hour observed CO concentration was half the permissible level, while the annual average PM_{10} concentration was slightly more than half at 52 percent of the permissible value. The single pollutant that exceeded the permissible level by a wide margin was the 24-hour PM_{10} concentration. The maximum observed 24-hour PM_{10} concentration was more than twice the permissible level; the permissible level for this parameter was exceeded in at least seven 24-hour periods over the 16-month monitoring period.

CariSal Unlimited collected onsite ambient air monitoring data over a 30-day period starting on October 25, 2007 (except for CO which began on November 2). Table 3.6-2 shows the results and compares them with Trinidad permissible levels. No exceedances of permissible levels were observed during the monitoring period. The highest fractions of the permissible levels were for the 24-hour PM_{10} and TSP concentrations.

To determine the appropriateness of the EMA data for use as background concentration in the impact analysis, CariSal acquired the EMA air quality data for the same time period as the CariSal on-site monitoring. However, during the early part of the monitored period, the EMA air quality monitoring system was not operational. Beginning November 4, 2007 at hour 18, the EMA data recommenced operations. A total of 692 hours was available for a comparison between the CariSal air quality data and the EMA air quality data. The pollutants available for comparison included CO, NO_2, and PM_{10} (SO_2 comparison is not meaningful as no values above the detection limit were recorded at the CariSal site). The mean 1-hour NO_2, 1-hour CO, and 24-hour PM_{10} concentrations at the EMA site were 6.2 parts per billion (ppb); 0.25 parts per million (ppm) and 23.2 $\mu g/m^3$, respectively. The mean NO_2, CO, and PM_{10} concentrations at the CariSal site were 10.2 ppb, 0.10 ppm and 25.9 $\mu g/m^3$, respectively. The higher CO values for the EMA site are likely caused by higher concentrations of light-duty gasoline vehicles in the vicinity of the EMA site, while the higher mean NO_2 at the CariSal site may be due to influences of the nearby NGE gas pipeline construction activity that occurred during the monitoring period. Both the CO and NO_2 concentrations are small fractions of the Trinidad and Tobago permissible values. The mean 24-hour PM_{10} values are very similar, suggesting that the monitored PM_{10} concentrations are representative over a broader scale; maximum 24-hour PM_{10} concentrations were also similar at 65.3 $\mu g/m^3$ at EMA and 60.1 gg/m^3 at CariSal. This suggests that the use of the EMA data as background concentration for the CariSal site is a reasonable approximation. Together, the EMA data and the CariSal data demonstrate that the current ambient air quality concentrations in the vicinity of the Project are below all of the permissible air quality levels provided in the draft Air Pollution Rules, except for the 24-hour PM_{10} concentration levels.

Table 3.6-1. Summary of Air Quality Measurements from EMA's Point Lisas Monitoring Site (2004–2007)

Air Pollutant	Averaging Period	Permissible Level		Observed Concentration			Percentage of Permissible Level		
				Maximum Observed	3-Year Average Maximum Short-term	Annual Average	Maximum Observed	3-Year Average Maximum Short-term	Annual Average
Units			µg/m³	µg/m³	µg/m³	µg/m³	%	%	%
Total Suspended Particulate	24-hour		150	NM	NM	NM			
PM_{10}	24-hour		75	154.4	116.4	N/A	206%	155%	
PM_{10}	Annual		50	29.0	N/A	25.8	58%		52%
$PM_{2.5}$	24-hour		65	NM	NM	NM			
$PM_{2.5}$	Annual		15	NM	NM	NM			
Units		µg/m³	ppb	ppb	ppb	ppb	%	%	%
Hydrogen Chloride (HCl)	30-minute	100	67	NM	NM	NM			
Chlorine (Cl_2)	30-minute	300	103	NM	NM	NM			
Nitrogen Dioxide (NO_2)	1-hour	200	106	37.0	34.1	N/A	35%	32%	
Nitrogen Dioxide (NO_2)	Annual	40	21	5.4	N/A	5.0	26%		24%
Carbon Monoxide (CO)	1-hour	30,000	26,196	13,200	10,380	N/A	50%	40%	
Carbon Monoxide (CO)	8-hour	10,000	8,732	2,130	1,770	N/A	24%	20%	
Sulphur Dioxide (SO_2)	24-hour	125	48	21.4	16.8	N/A	45%	35%	
Sulphur Dioxide (SO_2)	Annual	50	19	2.8	N/A	1.9	15%		10%

Notes:

EMA's Air Quality Monitoring for pollutants began in October 2004 with the exception of PM_{10}, which began in March 2006.
N/A - Not Applicable

NM - Not Monitored

Table 3.6-2. Background Air Quality Measured at the CariSal Site[a]

Air Pollutant	Averaging Period	Trinidad Draft Rules (2005) Permissible Level		On-Site Monitoring		Percentage of Permissible Level
				Maximum Observed	Period Average	
Units		µg/m³		µg/m³	µg/m³	Percent
Total Suspended Particulate	24-hour	150		89.0	N/A	59%
PM_{10}	24-hour	75		60.1	N/A	80%
PM_{10}	Annual	50		N/A	24.4	49%
PM_{25}	24-hour	65		20.8	N/A	32%
PM_{25}	Annual	15		N/A	7.9	53%
Units		µg/m³	ppb	ppb	ppb	Percent
Hydrogen Chloride (HCl)	30-minute	100	67	5.8[b,c]	N/A	6%
Chlorine (Cl_2)	30-minute	300	103	6.0[c]	N/A	6%
Nitrogen Dioxide (NO_2)	1-hour	200	106	38.0	N/A	36%
Nitrogen Dioxide (NO_2)	Annual	40	21.0	N/A	8.4	40%
Carbon Monoxide (CO)	1-hour	30,000	26,196	363	N/A	<1%
Carbon Monoxide (CO)	8-hour	10,000	8,732	123	N/A	<1%
Sulphur Dioxide (SO_2)	24-hour	125	48	2.5[d]	N/A	<1%
Sulphur Dioxide (SO_2)	Annual	50	19	N/A	2.5[4]	<1%

[a] Air quality monitoring data at the CariSal collected over a 30-day period starting late October 2007

[b] Based on 1/2 the minimum detection limit of 4 ppb for 24 hours with the integrated measurement scaled by 1/0.4 (= 2.5) based on USEPA "Screening Procedures for Estimating the Air Quality Impacts of Stationary Sources, Revised," pp. 4–16 (EPA-454/R-92-019)

[c] 1/5 power law relationship applied to estimate peak 30-min from 1-hour observed concentration

[d] 1/2 the minimum detection limit of 5 ppb

3.7 SEISMICITY

Trinidad is located on the Circum-Caribbean Tectonic Belt, which has produced several earthquakes of greater than 7.0 magnitude since 1900. Along with California and Jamaica, the island presents a greater-than-moderate earthquake risk. The most recent notable seismic activity occurred in September 2006 with a land-based earthquake of magnitude 5.8 on the Richter scale. Because of the higher rate of physical and industrial development in Trinidad and Tobago, the risks posed by earthquakes have also grown, necessitating extra care to be taken in facility design to minimize the potential harm from earthquakes (EcoEngineering Consultants Ltd. 2006). In order to achieve this, all structures within the CariSal facility would be designed to ANSI standard Zone III.

3.8.1 Populations and Central Statistical Office Statistics

The study area for the risk assessment is divided into three sectors: (1) the study area in the vicinity of the CariSal site, (2) the study area along the offsite caustic pipeline ROW and in the vicinity of the EISL facility caustic storage tank, and (3) the study area along the truck transportation route for hydrochloric acid and hypochlorite product. Population statistics for settlements in the vicinity of the CariSal facility are shown in Table 3.8-1.

Table 3.8-1. Population of Study Area for CariSal Site

Community	Population		% of Study Area	Area (sq. km)	Number of Households	Number of Buildings
	2000	2006				
Diamond	891	789	14.9	1.8	246	238
Dow Village	3,300	4,232	55.3	2.12	898	1,798
Esperanza	315	396 (est.)	5.3	0.55	84	84 (est.)
Phoenix Park (incl. Windsor)	1,456	2,074	24.4	5.65	368	364
Total	5,962	7,095	100	10.12	1,596	2,484
National	1,262,366					

Note: The estimated 2006 population for Esperanza is projected from the aggregate growth rate of the other three communities for which 2000 and 2006 population data are available. Number of buildings is estimated as approximately the number of households. Reference: Central Statistical Office of Trinidad and Tobago, 2000 & 2006

Worker population statistics for industrial areas along the caustic pipeline ROW and in the vicinity of the EISL facility caustic storage tank are shown in Table 3.8-2. The caustic pipeline ROW passes through industrial areas between the CariSal facility and the EISL facility. The closest industrial facility to the caustic pipeline ROW is the ANSA McAl Chlorine Plant, which has 50 people onsite during normal working hours. This is the most highly concentrated working population along the pipeline ROW. The Industrial Gas Limited facility is also located along the pipeline ROW. This facility employs 65 people onsite during normal working hours; however the Industrial Gas Limited facility is larger and therefore the workers are spread over a larger area and are farther from the pipeline ROW.

Phoenix Park Gas Processors and Yara Trinidad Limited are also located in the vicinity of the caustic pipeline ROW. These facilities collectively have 365 workers onsite during normal working hours; however, these facilities are larger in area than the ANSA McAl Chlorine, Aerogas Ltd., and Agro Chemical Ltd. facilities, and are located farther from the pipeline ROW. Employees of these facilities are therefore spread out over a larger area and not concentrated in the immediate vicinity of the pipeline ROW.

Industrial facilities along the pipeline ROW and EISL facility caustic storage tank study area and their associated numbers of workers are shown in Table 3.8-2.

Table 3.8-2. Worker Population of Study Area for Caustic Pipeline Right-of-Way/EISL Facility Caustic Tank

Industrial Facility	Working Population	
	During Normal Hours	Outside Normal Hours
ANSA McAl Chlorine Plant	50	6
Aerogas, Limited	4	2
National Agro Ltd. Chemicals	12	1
Total	66	9
Industrial Gases Limited	65	4
Petrotrin Compressor Station	2	0
Total	67	4
Phoenix Park Gas Processors	170	15
Yara Trinidad Limited	240	40
Total	419	55

Population statistics for settlements along the truck transportation route are shown in Table 3.8-3.

Table 3.8-3. Population of Study Area for Product Truck Transport Route

Community	Population		% of Study Area	Area (sq. km)	Number of Households	Number of Buildings
	2000	2006				
Friendship	[212]	212			65	87
Dow Village	3,300	4,232		2.12	898	1,798
Total	3,512	4,444	100		963	1,885
Couva/Tabaquite/Talparo Region		162,779			41,941	42,368

Reference: Central Statistical Office of Trinidad and Tobago, 2000 & 2006

Worker population statistics for industrial areas along the truck transportation route and in the vicinity of the DESALCOTT facility and Savonetta Pier #4 are shown in Table 3.8-4. The truck transportation route passes through industrial areas between the CariSal facility and Savonetta Pier #4. Hydrochloric acid produced by the CariSal facility would be transported by truck to the DESALCOTT facility, and bleach produced by the CariSal facility would be transported by truck to Savonetta Pier #4.

Table 3.8-4. Worker Population of Study Area for Product Truck Transportation Route

Industrial Facility	Working Population	
	Normal Hours	Outside Normal Hours
Northern Construction	200	5
CNC Ammonia	75	12
DESALCOTT	60	10
Office Shops (estimate)	10	0
Total	345	27

Table 3.8-4. Worker Population of Study Area for Product Truck Transportation Route

Industrial Facility	Working Population	
	Normal Hours	Outside Normal Hours
Atlas Methanol	75	12
Titan Methanol	75	12
AUM Complex	40	2
ESCO	32	2
Total	222	28
Universal Foods	40	10
L.J. Williams	25	3
Total	65	13

The closest industrial facilities to the truck transportation route for hydrochloric acid are Northern Construction, the CNC Ammonia plant, and the DESALCOTT facility. An area of offices and shops also occurs along the truck transportation route near the northeast corner of the CNC Ammonia plant. These facilities collectively have 345 workers onsite during normal working hours.

The closest industrial facilities to the truck transportation route for bleach (in addition to the industrial facilities in the vicinity of the DESALCOTT facility) are the Atlas Methanol Plant and Titan Methanol Plant, each of which has 75 workers onsite during normal working hours, the AUM Complex, which has 40 workers onsite during normal working hours, and ESCO, which has 32 workers onsite during normal working hours. This is the largest working population concentrated along the truck transportation route. In addition, Universal Foods and the L.J. Williams facility are located along the truck transportation route. These facilities collectively have 65 workers onsite during normal working hours.

3.8.2 Population Densities

Population data for the vicinity of the CariSal site are shown in Figure 3.8-1. This figure, which is taken from the quantitative risk assessment for the 36-inch (91 cm) Natural Gas Pipeline Loop to Ring Main Project, August 2006, is based on the 2000 Central Statistical Office (CSO) data and shown as a 100-m grid. The population data are time-weighted and corrected for the portion of the data that a specific individual is expected to be in the identified location. Modelled concentrations for the accidental release scenarios are shown in relation to the time-weighted population and in relation to the CSO data in the figures in Section 5 of this Risk Assessment. The results of the population analysis using the time-weighted population data and the CSO population data directly are both shown in the Section 5 figures. The analysis using the CSO population data is based on the population data from individual census tracts. The CSO data used in this analysis are not corrected for time-weighting or further delineated into a population density grid. The population analysis using the CSO data indicate a higher number of potentially exposed individuals than does the population analysis using the time-weighted population data. Therefore the results using the CSO data are reported in the individual risk and societal risk analyses in Sections 6 and 7 of this QRA and used for the risk ranking.

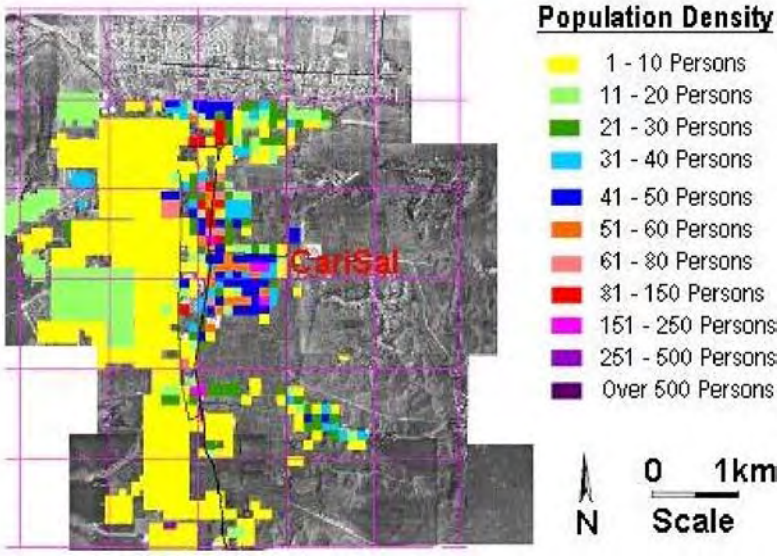


Figure 3.8-1. Time-weighted population map for the vicinity of the CariSal site.

3.8.3 Community Facilities and Sensitive Receptors

Community facilities and sensitive receptors are listed in Table 3.8-5. Modelled concentrations for the accidental release scenarios are shown in relation to the locations of community facilities and sensitive receptors in the figures in Section 5 and shown enlarged in Attachment 3. These facilities and receptors are represented by a red cross on the map, but are not always individually identifiable due to the geographic extent and resolution of the map.

Table 3.8-5. Community Facilities and Sensitive Receptors

Description
California Government School
California Hindu Mandir
Savonetta Private School
Savonetta Development
Pranz Gardens Recreation Ground
Debra's Mini Mall
Cemetery
T's Lounge
St. Phillips Anglican Church
Hindu temple
Mosque
Phoenix Park Government School
Double Deuce Bar
Phoenix Park Hideout Bar
Fire station
Green Door Restaurant and Bar
Pt. Lisas Roti Joint
Croisee Discount Mall
Macaulay Recreation Ground
Esperanza Mosque
Esperanza Presbyterian Church

Table 3.8-5. Community Facilities and Sensitive Receptors
Description
Esperanza Presbyterian School
Dow Village Recreational Ground
Dow Village Government School
Ramsingh's Hardware
California Medical Centre
SECU Credit Union
National Energy Skills Centre
New Testament Church Of God
California Youth Centre
Mosque
St. Moriah Baptist Church
Hanifa Aziz Nursery School
Yara Park (Recreation Ground)
Sea Queen Bar
Cedar Hill Road
St. Simon/St. Jude Anglican Church
Holy Cross RC Church
Lakshmi Hindu Manor
Ebenezer Presbyterian Church
Forres Park Seventh Day Adventist Church
Church
Claxton Bay Cemetery
Claxton Bay Fish Market (commonly known as the Fish Bay)
Superfoods Supermarket
Claxton Bay Senior Anglican School
TCL Recreation Ground
Claxton Bay Trace
Temple Street
Claxton Bay Open Bible Church
Small Playpark in Maingotville
Buena Vista Health Care Facility
Wesleyan Methodist Church
Asha's Kindergarten
Jusamco Pavers
Caldrac Club
Hilton Mitchell Road
Transformation Centre
Abdul Aziz Trust Headquarters
Dow Village Ramieela Ground
Last Stop Bar
Trinity Power (Power Station)
Esperanza Road
UTT (University of Trinidad and Tobago)
Brechin Castle Sugar Cane Factory
Club Sevilla
Sevilla Private School

4.0 OPERATIONAL ACCIDENT SCENARIOS

4.1 SCENARIO INFORMATION

Accident scenarios for the proposed chlor-alkali plant were identified based on reviews of the hazard identification (HAZID) and process flow diagrams and on considerations of the proposed process design and operation. As discussed in Section 1.5.4, accident scenarios were selected from the HAZID for further evaluation in the QRA based on the estimated frequency and consequence ratings of the scenarios and initial risk ranking. Accident scenarios associated with ex-situ facilities and offsite transportation operations also were identified and selected for further evaluation in the QRA using the same initial risk ranking criteria as used for onsite accident scenarios. The scenarios evaluated in the QRA fall into eight categories. Accident scenarios for which quantitative consequence modelling was conducted and their associated likelihood rating, severity rating, and initial risk ranking are listed in Table 4.1-1. Accident scenarios for which offsite consequences are not anticipated and for which quantitative consequence modelling was not conducted are listed in Table 4.1-2 with their associated likelihood rating, severity rating, and initial risk ranking. The characteristics of the accident scenarios are described in Section 4.2.

Approximate onsite accidental release/incident locations for the accident scenarios are depicted in the figures, as appropriate, in Section 5 of this QRA.

Table 4.1-1. Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
1.	*Onsite hazardous material (gaseous) release*				
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	*2*	*3*	*C*
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	*2*	*3*	*C*
1.a.3	Chlorine [outdoor] process pipe breach [seismic event]	Cl_2 release	*3*	*1*	*8*
1.b	Intermixing of Hypochlorite with HCl	Cl_2 release	3	4	C
2.	*Onsite hazardous material (liquid) release*				
2.a	Vessel Failure: Onsite NaOH storage tank	NaOH spill	*2*	*4*	*C*
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	2	3	C
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	*2*	*3*	*C*
3.	*Flammable gas release (dispersion)*				
3.a.1	Hydrogen [indoor] process pipe breach	H_2 release	*2*	*2*	*8*
3.a.2	Hydrogen [outdoor] process pipe breach	H_2 release	*2*	*2*	*8*
3.a.3	Hydrogen [outdoor] process pipe breach [seismic event]	H_2 release	*3*	*1*	*8*
3.b.1 3.b.2	Hydrogen vent stack release HCl scrubber stack release	H_2 release H_2 release	*2*	*3*	*C*
4.	*Flammable gas release (deflagration)*				
4.a	Onsite Natural gas deflagration	CH_4 release	3	3	C
4.b	Offsite Natural gas deflagration	CH_4 release	3	3	C
5	*Offsite [ex-situ] facility hazardous material release*				
5.a	Vessel Failure: Offsite EISL Facility caustic tank breach	NaOH spill	*3*	*3*	*C*
5.b	Offsite caustic pipeline breach	NaOH spill	*3*	*3*	*C*

Table 4.1-1. Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
6.	*Offsite transportation hazardous material release*				
6.a	Hydrochloric acid: 4,000 gallon (15,140 L) tank truck accident	HCl spill	*3*	*3*	*C*
6.b	Hypochlorite: 4,000 gallon (15,140 L) tank truck accident	bleach spill	*3*	*3*	*C*

Reference: Conve & AVS Inc. 2007.
Note: Probability and Severity ratings offsite transportation accidents are estimated to be similar to vessel failure scenarios; offsite transportation accidents are not addressed in the HAZID. Based on plant design considerations for the purposes of initial risk ranking the probability of a seismic event of sufficient magnitude to affect both chlorine process lines simultaneously is estimated to be 1, corresponding to a frequency of occurrence between zero and 1 x 10^{-6}. Storage tank leaks are not addressed because they would not significantly contribute to off-site individual risk.

[a] See Table 1.5-4 in Section 1.5-4 of this QRA for definitions of risk, B and C.

Table 4.1-2: Accident Scenarios

No.	Scenario	Type	Severity	Prob.	Risk[a]
7.	*Onsite equipment fire and explosion scenarios*				
7.a	Natural gas leak, Steam Boiler System	CH_4 release	2	3	B
7.b	Boiler Control Failure, Steam Boiler System	Explosion	2	3	B
7.c	Natural gas leak,77% or 94% $CaCl_2$ Drying	CH_4 release	2	3	B
7.d	Reverse H_2:Cl_2 ratio in Hypochlorite Units	Explosion	1	5	C
7.e	Absorption tower deflagration, Hypochlorite Units	H_2/O_2 release	2	2	B
7.f	Membrane pin hole leak, Electrolysis Unit	Explosion	2	3	C
7.g	Hydrogen stack ignition (lightning)	Fire	1	5	C
7.h	Membrane fire	Fire	1	4	B
7.i	Transformer/Rectifier fire	Fire	3	5	D
7.j	Gasket Breach Electrolysis Module	H_2 release	1	5	C
8.k	Piping Failure, Electrolyser Unit	H_2 release	2	3	C
8.	*Onsite hazardous materials release scenarios*				
8.a	Vessel Failure, Steam Boiler System	Steam release	2	2	B
8.b	Vessel Failure, $CaCl_2$ Production	HCl spill	2	3	C
8.c	Piping Failure, $CaCl_2$ Production	HCl spill	2	3	C
8.d	Vessel Failure, Caustic Evaporation Unit	NaOH leak	2	4	C
8.e	Piping Failure, Caustic Evaporation Unit	NaOH leak	1	4	B
8.f	System Over/Under Pressure, Caustic Evaporation Unit	NaOH leak	2	2	B
8.g	Vessel Failure, Hypochlorite Units	HCl gas release	2	2	B
8.h	*Vessel Failure, Electrolysis Unit*				
8.h.1	Physical Dechlorination Vessel	Cl_2 release	2	2	B
8.h.2	Chlorate Destruction Vessel	HCl (18%) spill	2	2	B
8.h.3	Chemical Dechlorination Vessel	Alkaline brine	2	2	B
8.i	*Piping Failure, Electrolysis Unit*				
8.i.1	Physical Dechlorination Vessel Piping	Cl_2 release	2	2	B
8.i.2	Chlorate Destruction Vessel Piping	HCl (18%) spill	2	2	B
8.i.3	Chemical Dechlorination Vessel Piping	Alkaline brine	2	2	B
8.j	Gasket Breach Electrolysis Module	Cl_2 release	1	5	C
8.k	Piping Failure, Electrolyser Unit				
8.k.1	*Gasket Failure, Electrolyser Unit*	Cl_2 release	2	4	C
8.k.2	*Header Pipe Failure, Electrolyser Unit*	NaOH (32%) spill	2	3	C
8.l	*Piping Failure, Secondary Brine Treatment*				
8.l.1	Piping Failure, Secondary Brine Treatment	HCl (18%) spill	2	2	B
8.l.2	Piping Failure, Secondary Brine Treatment	NaOH (32%) spill	2	2	B

Reference: Conve & AVS Inc. 2007.
[a] See Table 1.5-4 in Section 1.5-4 of this QRA for definitions of risk, B, C, and D.

4.2.1 Onsite Hazardous Material (Gaseous) Release

Onsite gaseous hazardous materials release scenarios include the potential releases of chlorine. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for gaseous release scenarios are provided in Table 4.2-1.

4.2.1.1 Scenario 1.a. Chlorine [indoor and outdoor] process pipe breach (Cl_2 release)

Releases of chlorine gas may result from several accident scenarios, including breach of a chlorine process pipe either within the cell room (indoors) or outside of the cell room (outdoors) as a result of physical damage to the process pipe. These two scenarios have been modelled separately, as the release conditions differ. A chlorine release would be detected by plant monitoring equipment and would activate the plant dry compressed air purge system and emergency plant shutdown procedures. The dry compressed air purge system would purge chlorine gas from process equipment and piping to the bleach plant, where the chlorine would be absorbed. Plant emergency shutdown would occur immediately and purging would be complete in approximately 3 minutes from initiation, limiting the chlorine release duration to approximately 3 minutes. The worst-case volume of chlorine for modelling purposes contained in the breached process equipment is equivalent to a release rate of approximately 95 pounds (43 kilograms) per minute for 3 minutes, for a total release of 285 pounds (129 kilograms) of chlorine (CariSal Limited 2007). The actual release would be less because, once the emergency was automatically detected, the production of chlorine is stopped and the pressure in the system would decay until it equalizes with atmospheric pressure.

Scenarios 1.a.1 and 1.a.2 are based on a release of chlorine from one of the two process lines. The possibility of a seismic event causing a chlorine release from both process lines simultaneously is also considered as Scenario 1.a.3. Under Scenario 1.a.3, the amount of chlorine released would be twice that of Scenario 1.a.2. The probability of a seismic event of sufficient magnitude to affect both process lines simultaneously is low. All structures within the CariSal plant would be designed to ANSI Standard Zone III. Such structures should withstand an earthquake classified as Zone VIII on the Modified Mercalli Scale or Magnitude 6 on the Richter scale (CariSal Limited 2007). Therefore the likelihood of a seismic event of sufficient magnitude to affect both process lines simultaneously is estimated to be Category 1, corresponding to a frequency between 0 (never) and 1 in 1,000,000 years.

Scenario 1.a.1 Indoor Release Scenario

For the indoor release, the 285 pounds (129 kilograms) of chlorine would be released within the cell room over a 3-minute period at a pressure of 3.96 psig (1.25 bar) and would be entrained in the cell room ventilation (ambient air) system and exhausted to the atmosphere. The location of the cell room vent is shown in Figure 3.4-13 in Attachment 3 to this QRA, and the estimated exhaust gas flow rate is approximately 100,000 Nm^3/hr.

Scenario 1.a.2 Outdoor Release Scenario

For the outdoor release, the 285 pounds (129 kilograms) of chlorine would be released to the atmosphere over a 3-minute period at a pressure of 3.96 psig (1.25 bar). The release is assumed to occur as an elevated release (4-m release height) – Based on process stream #402 of the flow diagram, the more likely worst case for offsite maximum concentration would be elevated, as the relatively low pressure (1.17 psig or 1.1 bar), low temp (87 °C), and flow rate of 1,807 m^3/hr likely would have the maximum concentration located onsite.

This scenario is based on the assumption that the chlorine that is purged to the bleach plant through the dry compressed air purge system is completely absorbed and that no residual chlorine is emitted to the atmosphere from this event.

Scenario 1.a.3 Outdoor Release Scenario (Seismic Event)

For an outdoor release caused by a seismic event, the 285 pounds (129 kilograms) of chlorine is assumed to be released to the atmosphere over a 3-minute period at a pressure of 3.96 psig (1.25 bar) from each of the two electrolysis units, for a combined release of 570 pounds (259 kilograms) of chlorine. The release is assumed to occur as an elevated release (4-m release height) – Based on process stream #402 of the flow diagram, the more likely worst case for offsite maximum concentration would be elevated, as the relatively low pressure (1. 17 psig or 1.1 bar), low temp (87°C), and flow rate of 1,807 m^3/hr likely would have the maximum concentration located onsite.

This scenario is based on the assumption that the chlorine that is purged to the bleach plant through the dry compressed air purge system is completely absorbed and that no residual chlorine is emitted to the atmosphere from this event.

4.2.1.2 Scenario 1.b. Intermixing of Hypochlorite with HCl (Cl_2 release)

Chlorine could be released in the event of the inadvertent mixing of hydrochloric acid and hypochlorite product in a 4,000-gallon (15,140 litre) tank truck during product loading for shipment offsite. Tank trucks used to transport hypochlorite and hydrochloric acid would normally be dedicated to one material or the other; a breach of procedure could result in inadvertent mixing of the two materials. The scenario would involve the inadvertent loading of 4,000 gal (15,140 L) of hypochlorite product into a 4,000-gallon (15,140-litre) tank truck that already contains a 100-gallon (379-L) "heel' of hydrochloric acid, or the inadvertent loading of 4,000 gal (15,140 L) of hydrochloric acid into a 4,000-gallon (15,140 litre) tank truck that already contains a 100-gallon (379-L) "heel' of hypochlorite. The hypochlorite product contains approximately 12 percent chlorine, and either scenario would result in a release of 120 pounds (54 kilograms) of chlorine gas from the reaction of hypochlorite with the hydrochloric acid. The chlorine gas release would occur from the tank truck vent at an assumed release height of 4 m. The tank truck would be located outdoors at the CariSal plant loading.

CariSal has suggested that this inadvertent mixing scenario could be prevented by fitting the hydrochloric acid and hypochlorite trucks and loading stations with unique nozzle fittings so that the loading apparatus for hypochlorite could not physically be used to load a hydrochloric acid truck because the nozzle would not fit; vice versa for the hydrochloric acid loading apparatus and

hypochlorite trucks, and that CariSal would agree to install such dedicated nozzle fittings. The inadvertent mixing scenario has been modelled in the Risk Assessment to estimate the potential consequences of an event; however, the risk assessment analysis would then assign the scenario an appropriately low probability of occurrence commensurate with the planned installation of the dedicated nozzles.

4.2.2 Onsite Hazardous Material (Liquid) Release

Onsite liquid hazardous materials release scenarios include potential releases of sodium hydroxide, and hydrochloric acid. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for liquid release scenarios are provided in Table 4.4-2.

4.2.2.1 Scenario 2.a. Vessel Failure: Onsite sodium hydroxide storage tank (NaOH spill)

An accidental release of liquid NaOH could occur from vessel failure of an onsite NaOH storage tank, resulting in a maximum 20,300-gallon (77-m^3) release from one of the onsite NaOH storage tanks. This release would involve the 50-percent NaOH product. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would result in the secondary containment system being filled. NaOH emissions could result from evaporation from the secondary containment system.

4.2.2.2 Scenario 2.b. Vessel Failure: Onsite hydrochloric acid storage tank (HCl spill)

An accidental release of liquid HCl could occur from vessel failure of the onsite hydrochloric acid storage tank, resulting in a maximum 400,000-gallon (1,514-m^3) release. This release would involve the 36-percent HCl product. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would result in the secondary containment system being filled, and that HCl emissions would result from the devolution of HCl vapour from the secondary containment system.

4.2.2.3 Scenario 2.c. Vessel Failure: Onsite hypochlorite storage tank (bleach spill)

An accidental release of liquid hypochlorite could occur from vessel failure of the onsite hypochlorite storage tank, resulting in a maximum 187,000-gallon (708-m^3)release. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would result in the secondary containment system being filled, and that emissions would result from the devolution of chlorine monoxide gas from the secondary containment system.

4.2.3 Flammable Gas Release (Dispersion) Scenario

Flammable gas release (dispersion) scenarios include potential releases of hydrogen. Potential releases of natural gas (methane) have been modelled as a deflagration scenario, not as a dispersion scenario, as described below. The estimated release height, velocity, temperature,

duration, release rate, and total release of flammable gases (hydrogen) for flammable gas release scenarios are given in Table 4.2-2.

4.2.3.1 Scenario 3. a. Hydrogen [indoor and outdoor] process pipe breach (H_2 release)

Releases of hydrogen gas could result from several accident scenarios, including breach of hydrogen process piping either within the cell room (indoors) or outside of the cell room (outdoors) as a result of physical damage to the process pipe. These two scenarios have been modelled separately, as the release conditions differ. A hydrogen release would activate the plant nitrogen gas purge system and emergency plant shutdown procedures. The nitrogen gas purge system would purge hydrogen gas from process equipment and piping to the hydrogen vent stack, where the hydrogen/nitrogen gas mixture would be exhausted to the atmosphere un-combusted. Plant emergency shutdown would occur in approximately 3 minutes from initiation, limiting the un-combusted hydrogen gas release duration to approximately 3 minutes. The volume of hydrogen contained in the breached process equipment is equivalent to a release rate of approximately 3 pounds (1.4 kg) of hydrogen for 3 minutes, for a total release of 9 (4.1 kg) pounds of hydrogen (CariSal Limited 2007).

Scenario 3.a.1 Indoor Release Scenario

For the indoor release, the 9 (4.1 kg) pounds of hydrogen would be released within the cell room over a 3-minute period at a pressure of 4.18 psig and would be entrained in the cell room ventilation (ambient air) system and exhausted to the atmosphere. The cell room vent is shown in Figure 3.4-13 in Attachment 3 of this QRA, and the estimated exhaust gas flow rate is approximately 100,000 Nm^3/hour.

Scenario 3.a.2 Outdoor Release Scenario

For the outdoor release, the 9 (4.1 kg) pounds of hydrogen would be released to the atmosphere over a 3-minute period at a pressure of 4.18 psig. The release is assumed to occur at an elevation of 4-m release height. Modelling this scenario as an elevated level release, the modelling would assess whether the Flammable Gas Lower Explosive Limit (LEL) of 4 percent for hydrogen would be exceeded at a potential ignition point to cause an explosion.

Scenario 3.a.3 Outdoor Release Scenario (Seismic Event)

For the outdoor release caused by a seismic event, it is assumed that 9 pounds (4.1 kg) of hydrogen would be released to the atmosphere over a 3-minute period at a pressure of 4.18 psig from each of the two electrolysis units, for a total release of 18 pounds (8.2 kg) of hydrogen. The release is assumed to occur at an elevation of 4-m release height. Modelling this scenario as an elevated level release, the modelling would assess whether the Flammable Gas Lower Explosive Limit (LEL) of 4 percent for hydrogen would be exceeded at a potential ignition point to cause an explosion.

4.2.3.2 Scenario 3.b. Hydrogen vent stack release and HCl scrubber stack release

Under either the indoor or outdoor process pipe breach scenario, un-combusted hydrogen would also be released through the nitrogen gas purge system to the hydrogen stack. In addition to the 9 pounds (4.1 kg) of hydrogen released from the process pipe breach, an additional 15 cubic

metres (m^3) of hydrogen would be released from the process piping to the hydrogen stack along with 200 Nm^3/hr of nitrogen purge gas. The hydrogen vent is shown in Figure 3.4-13 in Attachment 3 to this QRA, and estimated exhaust gas flow rate is 200 Nm^3/hr of nitrogen over a 30-minute period. In addition the hydrogen pipelines to the HCl synthesis units would also be purged with approximately 200 Nm^3/hr of nitrogen over a 30-minute period, involving an additional 15 m^3 of hydrogen. The hydrogen stack and HCl scrubber vent releases would be modelled as simultaneous releases.

4.2.4 Flammable Gas Release (Deflagration) Scenario

4.2.4.1 Scenario 4.a. Onsite Natural gas deflagration (CH4 release)

A catastrophic breach of the onsite natural gas line could result in a release of natural gas (methane) from approximately 40 ft (12 m) of 6-inch-diameter (15 centimetre-diameter) pipe, corresponding to a volume of approximately 8 ft^3 (0.023 m^3) of natural gas at a pressure of 1 psig (1.1 bar.) For this scenario it is assumed that the released gas ignites immediately upon release at the point of release.

4.2.4.2 Scenario 4.b. Offsite Natural gas deflagration (CH4 release)

CariSal would be making a 6-inch (15-centimetre) minimum or 8-inch (20-centimetre) maximum diameter tie-in to the existing NGC 24-inch (61-centimetre) Residue Gas Header to supply natural gas to the CariSal site via a metering station on the CariSal site. The line length from the NGC 24-inch (61-centimetre) pipeline to the metering station on the CariSal site is anticipated to be approximately 20 m.

In the event of a line leak from the tie-in, the leak would be detected by gas sensors as well as by pressure and volume sensors that would close the emergency shutdown valves, thereby reducing the amount of gas leaking to the environment. Pressure sensors similarly protect the NGC's header and emergency shutdown valves. The residue gas pressure is approximately 340 to 360 psig (24.5 to 26 bar). A release of the entire volume of natural gas pipeline between the shutdown valves at the Residue Gas Header and the CariSal onsite metering station would involve 0.65 m^3 of natural gas at release pressure, equivalent to 16.6 standard cubic metres of natural gas at standard atmospheric pressure.

For this scenario it is assumed that the released gas ignites immediately upon release at the point of the release.

4.2.5 Offsite Fixed Facility Hazardous Material Release

Offsite fixed facilities include the caustic pipeline and EISL facility caustic storage tank. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for offsite fixed facility accident scenarios are given in Table 4.2-1.

4.2.5.1 Scenario 5.a. Vessel Failure: Offsite EISL facility caustic tank breach (NaOH spill)

An accidental release of liquid NaOH could occur from failure of the EISL facility caustic storage tank vessel resulting in a 2.5-million gallon (9,464 m^3) release. This release would involve the 50-percent NaOH product. Any release from the caustic tank would be contained in

the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel results in the secondary containment system being filled. NaOH emissions could result from evaporation from the secondary containment system.

4.2.5.2 Scenario 5.b. Offsite caustic pipeline breach (NaOH spill)

An accidental release of liquid NaOH could occur from physical damage to the caustic pipeline causing a pipeline breach. This release would involve the 50-percent NaOH product. The caustic pipeline is equipped with pressure sensors and automatic shutoff valves at the CariSal facility and at the EISL facility caustic storage tank location. A decrease in pipeline pressure resulting from a pipeline breach would be detected by the pressure sensors and cause the shutoff valves to activate, isolating the pipeline from both the CariSal facility process piping and from the caustic tank. Therefore only the NaOH in the pipeline at the time of a pipeline breach could potentially be released in the event of a pipeline breach. A pipeline breach could result in a release of 50-percent of the pipeline volume between the shutoff valve at the CariSal facility and shutoff valve at the caustic tank location. The caustic pipeline is 6 inches (in.) [15 centimetres (cm)] in diameter and approximately 2 km in length. The pipeline breach scenario could result in an estimated release volume of 9,640 gal (36,490 L), based on the pipeline volume, of liquid NaOH. The pipeline is assumed to not have any secondary containment system, and therefore the release would be modelled as a ground-level release (1 -m release height.) For this scenario it is assumed that the NaOH release occurs over a paved area (e.g., a roadway) and that the liquid release remains in the paved area until neutralized by emergency responders.

4.2.6 Offsite Transportation Hazardous Material Release

4.2.6.1 Scenario 6.a. Hydrochloric acid: 4,000-gallon (15,140-litre) tank truck accident on public road (HCl spill)

Hydrochloric acid would be transported to local customers using 4,000-gallon (15,140-litre) tank trucks travelling on public roads. An accidental release could result from an offsite transportation accident, potentially involving another vehicle. A release resulting from a transportation accident would be assumed to involve the entire 4,000-gallon (15,140-litre) volume of the tank truck and would be assumed to be uncontained. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for offsite transportation accident scenarios are given in Table 4.2-1.

For this scenario it is assumed that the hydrochloric acid release occurs over a paved area (e.g., a roadway) and that the liquid release remains in the paved area until neutralized by emergency responders.

4.2.6.2 Scenario 6.b. Hypochlorite: 4,000-gallon (15,140-litre) tank truck accident on public road (bleach spill)

Hypochlorite (bleach) would also be transported to local customers using 4,000-gallon (15,140-litre) tank trucks travelling on public roads. As in Scenario 6a above, an accidental release could result from an offsite transportation accident, potentially involving another vehicle. A release resulting from a transportation accident would be assumed to involve the entire 4,000-gallon (15,140-litre) volume of the tank truck and would be assumed to be uncontained. The estimated

release height, velocity, temperature, duration, release rate, and total release of hazardous materials for offsite transportation accident scenarios are given in Table 4.2-1. As with Scenario 6.a above, it is assumed that the hypochlorite release occurs over a paved area (e.g., a roadway) and that the liquid release remains in the paved area until it is neutralized by emergency responders.

4.2.7 Onsite Equipment Fire and Explosion Scenarios

Onsite equipment fire and explosion scenarios include scenarios identified in the HAZID, such as a transformer/rectifier fire, that could result in potential onsite consequences to employees, contractors, and visitors, but are not anticipated to result in offsite consequences to the public. Scenarios having the potential for offsite consequences to the public and for which quantitative modelling has been conducted are not included in the Onsite Equipment Fire and Explosion Scenario category, but are described above.

4.2.7.1 Scenario 7.a. Natural Gas Leak, Steam Boiler System

Under this scenario the natural gas piping to the steam boiler system experiences mechanical failure as a result of inadequate installation of equipment. This event could result in a natural gas leak. The natural gas could contact an ignition source and ignite, potentially resulting exposing employees to fire.

4.2.7.2 Scenario 7.b. Boiler Control Failure, Steam Boiler System

Under this scenario boiler control failure results in an explosion and pressure release in the steam boiler system. This event could result in exposure of employees to explosion pressure or steam release (see also Scenario 8.a., Vessel Failure, Steam Boiler System).

4.2.7.3 Scenario 7.c. Natural Gas Leak, 77% or 94% Calcium Chloride Drying

Under this scenario a natural gas leak develops in the 77percent $CaCl_2$ drying process or the 94-percent $CaCl_2$ drying process. The natural gas could contact an ignition source and ignite, potentially exposing employees to fire. Natural gas deflagration resulting from a natural gas leak and subsequent ignition at the point of release is described above and modelled under Scenario 4.a.

4.2.7.4 Scenario 7.d. Reverse H_2:Cl_2 Ratio, Hypochlorite Units

Under this scenario a process upset causes the ratio of H_2 and Cl_2 in the hypochlorite unit (absorption of chlorine gas and 34-perccent HCl production) to reverse from the normal 1.05 H_2:1.0 Cl_2 ratio process operating condition. Under normal operation and design conditions, the H_2 cell pressure would be higher than atmospheric pressure and higher than the Cl_2 pressure, and redundant pressure transmitters would be installed to control the pressure differential (CariSal Limited 2007). A ratio reversal event could result in an explosion within the process equipment. This event would cause damage to the unit in which the explosion occurred and also potential release of HCl gas to the atmosphere.

4.2.7.5 Scenario 7.e. Absorption Tower Deflagration, Hypochlorite Units

Under this scenario a failure of dilution air flow (e.g., due to compressor failure) in the hypochlorite unit (absorption of chlorine gas and production of sodium hypochlorite) would cause H_2 to collect (from the less than 0.1 percent present in the Cl_2 gas) and O_2 and H_2 to be vented to the outlet of the absorption towers. Potential ignition sources could cause deflagration of the H_2 and O_2 in the absorption tower.

4.2.7.6 Scenario 7.f. Membrane Pinhole Leak, Electrolysis Unit

Under this scenario a pinhole leak develops in a brine electrolysis module membrane, causing H_2 and Cl_2 to mix and creating the potential for an explosion within the equipment. This event would cause damage to the module in which the explosion occurred and result in an unplanned shutdown of the unit and potential loss of 8 hours of production for the unit while repairs are conducted. Any unit shutdown would activate the purge gas system that would vent excess chlorine gas to the absorption tower and excess hydrogen gas to the hydrogen vent stack.

4.2.7.7 Scenario 7.g. Hydrogen Stack Ignition (Lightning)

Under this scenario the hydrogen stack, which normally vents un-ignited hydrogen from the brine electrolysis process, is struck by lightning, igniting the hydrogen and causing a fire in the stack. This event would cause the purge gas system to activate, venting nitrogen gas to the hydrogen stack to extinguish the fire.

4.2.7.8 Scenario 7.h. Membrane Fire

Under this scenario the brine electrolysis process electrolyser is operated empty of process fluids, causing the membrane to catch fire. This event would result in an unplanned emergency shutdown of the electrolyser unit.

4.2.7.9 Scenario 7.i. Transformer/Rectifier Fire

Under this scenario the electrical transformer rectifier for the CariSal electrolysis unit experiences a fault and catches fire. This event would result in an unplanned emergency shutdown of the electrolyser unit. Repair or replacement of the transformer/rectifier could require an extended outage of the electrolyser unit and affect production.

4.2.7.10 Scenario 7.j. Gasket Breach, Electrolysis Module

Under this scenario an electrolyser module experiences a gasket breach resulting in vessel or piping failure. This scenario could result in a release of chlorine or hydrogen to the cell room. Potential hydrogen gas releases from the cell room are modelled under Scenario 3.a. Potential chlorine gas releases from the cell room are discussed below under Scenario 8.j. and modelled under Scenario 1.a. 1.

4.2.7.11 Scenario 7.k. Piping Failure, Electrolysis Unit

Failure of the electrolyser hydrogen header pipe in the brine electrolysis unit could result in a release of hydrogen and hot 32-percent caustic to the cell room. Caustic released would be contained in the cell room sump and drain system. Potential caustic releases are discussed under

Scenario 8.k.2 below. Potential hydrogen gas releases from the cell room under this scenario are modelled under Scenario 3.a.1.

4.2.8 Onsite Hazardous Materials Release Scenarios

Onsite hazardous materials release scenarios include scenarios identified in the HAZID, such as process pipe leaks, that could result in potential onsite consequences to employees, contractors, and visitors, but are not anticipated to result in offsite consequences to the public. Scenarios having the potential for offsite consequences to the public and for which quantitative modelling has been conducted are not included in the Onsite Hazardous Materials Release Scenario category, but are described above.

4.2.8.1 Scenario 8.a. Vessel Failure, Steam Boiler System

Under this scenario overpressure in the steam boiler system results in vessel failure and a subsequent release of steam. This event could potentially expose workers to steam.

4.2.8.2 Scenario 8.b. Vessel Failure, Calcium Chloride Production

Under this scenario over pressure or under-pressure resulting from process upset, or vessel corrosion, results in failure of the limestone reaction vessel (reaction to 42-percent $CaCl_2$) in the calcium chloride production process. This event could result in release of hot hydrochloric acid into the production area, potentially exposing employees to HCl.

4.2.8.3 Scenario 8.c. Piping Failure, Calcium Chloride Production

Under this scenario, piping associated with the limestone reaction vessel (reaction to 42-percent $CaCl_2$) experiences mechanical failure. This event could result in release of hot hydrochloric acid into the production area, potentially exposing employees to HCl.

4.2.8.4 Scenario 8.d. Vessel Failure, Caustic Evaporation Unit

Under this scenario, plate heat exchanger internals in the caustic evaporation unit (32-percent NaOH to 50-percent NaOH) experience mechanical failure. This event could result in the release of 32-percent to 50-percent caustic into the process condensate or cooling water, potentially exposing employees to NaOH.

4.2.8.5 Scenario 8.e. Piping Failure, Caustic Evaporation Unit

Under this scenario, piping associated with the caustic evaporation unit (32-percent NaOH to 50-percent NaOH) experiences mechanical failure. This event could result in release of 32-percent to 50-percent caustic into the production area, potentially exposing employees to NaOH. The caustic release from the piping would be contained in the plant room sump and drain system for subsequent treatment and disposal.

4.2.8.6 Scenario 8.f. System Over/Under-pressure, Caustic Evaporation Unit

Under this scenario, failure of the vacuum pump or steam supply to the caustic evaporation unit (32-percent NaOH to 50-percent NaOH) results in system over or under-pressure. This event could result in a release of 32-percent to 50-percent caustic into the production area, potentially

exposing employees to NaOH. The caustic release from the unit would be contained in the plant room sump and drain system for subsequent treatment and disposal.

4.3.8.7 Scenario 8.g. Vessel Failure, Hypochlorite Unit

Under this scenario, a vessel in the hypochlorite unit (absorption of chlorine gas and 34-percent HCl production) experiences mechanical failure as a result of lining failure or other thermal stress. This event could result in a release of HCl gas into the production area, potentially exposing employees to HCl.

4.2.8.8 Scenario 8.h. Vessel Failure, Electrolysis Unit

Under this scenario, a vessel in the electrolysis process (brine dechlorination) experiences mechanical failure. Three potential failure events are included under Scenario 8.h, involving failure of the physical dechlorination vessel, chlorate destruction vessel, and chemical dechlorination vessel.

Scenario 8.h.1 Physical Dechlorination Vessel Scenario

Failure of the physical dechlorination vessel would result in the release of hot depleted brine and chlorine gas from the vessel. This event would involve a release inside the cell room. The cell room ventilation system would disperse the chlorine, and the hot depleted brine release from the vessel would be contained in the cell room sump and drain system. Potential chlorine gas releases from the cell room are modelled under Scenario 1.a.

Scenario 8.h.2 Chlorate Destruction Vessel Scenario

Failure of the chlorate destruction vessel would result in the release of hot depleted brine and 18-percent hydrochloric acid from the vessel. The hot depleted brine and hydrochloric acid released from the vessel would be contained in the site sump and drain system.

Scenario 8.h.3 Chemical Dechlorination Vessel Scenario

Failure of the chemical dechlorination vessel would result in the release of hot alkaline brine. The hot alkaline brine released from the vessel would be contained in the site sump and drain system.

4.2.8.9 Scenario 8.i. Piping Failure, Electrolysis Unit

Under this scenario, process piping in the electrolysis process (brine dechlorination) experiences mechanical failure. Process piping failures could be related to piping associated with the physical dechlorination vessel, chlorate destruction vessel, or chemical dechlorination vessel. Potential releases from mechanical failure of piping would be as described under Scenario 8.h.1, 8.h.2, and 8.h.3 depending upon which vessel the failed process piping is associated with. These three piping failure scenario events are Scenario 8.i.1, 8.i.2, and 8.i.3.

4.3.8.10 Scenario 8 j. Gasket Breach, Electrolysis Module

Under this scenario an electrolyser module experiences a gasket breach resulting in vessel or piping failure. This scenario could result in a release of chlorine or hydrogen to the cell room.

Potential chlorine gas releases from the cell room are modelled under Scenario 1.a. Potential hydrogen gas releases from the cell room are discussed above under Scenario 7.j. and modelled under Scenario 3.a.

4.2.8.11 Scenario 8.k. Piping Failure, Electrolysis Unit

Under this scenario, the electrolyser chlorine header pipe gasket or hydrogen header pipe experiences mechanical failure.

Scenario 8. k.1 Chlorine Header Pipe Gasket Failure Scenario

This scenario could result in a release of chlorine and hot depleted brine to the cell room. Chlorine released would be vented through the cell room ventilation system. Potential chlorine gas releases from the cell room are modelled under Scenario 1 .a.

Scenario 8. k.2 Hydrogen Header Pipe Failure Scenario

This scenario could result in a release of hydrogen and hot 32-percent caustic to the cell room. Caustic released would be contained in the cell room sump and drain system. Potential hydrogen gas releases from the cell room under this scenario are discussed above under Scenario 7.k. and modelled under Scenario 3.a.

4.2.8.12 Scenario 8.l. Piping Failure, Secondary Brine Treatment

Under this scenario, process piping in the secondary brine treatment unit experiences mechanical failure. This event would result in a release of 18-percent hydrochloric acid or 32-percent caustic to the production area, potentially exposing employees to HCl or NaOH.

4.3 QUANTITATIVE CONSEQUENCE MODELLING PARAMETERS

Information on the types and amounts of hazardous or flammable materials anticipated to be released under accident scenario conditions and the physical parameters for the accident scenario modelling are given in Table 4.2-1 for hazardous materials releases and in Table 4.2-2 for flammable materials releases for each scenario for which quantitative consequence modelling was conducted. Release profiles for potential chlorine, caustic, hydrochloric acid, and hypochlorite release events are provided in Table 4.2-1, and release profiles for potential natural gas and hydrogen release events are provided in Table 4.1-2. Hazardous and flammable material release rates for onsite incidents were estimated based on the incident affecting one of the two 50,000-ton per year chlor-alkali units.

Releases from intermediate and product storage tanks are assumed to involve the entire volume of the storage tank being released into the containment system. Containment systems would be designed to contain 110 percent of the volume of the storage tank. Containment system volumes and surface areas used in the accidental release modelling for storage tank releases are shown in Table 4.2-3.

Table 4.2-1. Accident Scenario Information – Onsite Hazardous Materials Release and Offsite Fixed Facility and Transportation Scenarios

Description Accidental Release Scenario	Release height (m)	Release temp (° C)	Release velocity	Release Duration (min.)	Pressure (psia)	Total Release		Release rate (kg/min)	
						gal. (m^3)	MT	(Hazardous Material)	
Onsite Hazardous Material (Gaseous Cl_2 release)									
1.a.1. Chlorine [indoor] process pipe breach	1	Ambient	100,000 Nm^3/hr	3	Ambient	–	0.13	43.1	Cl_2
1.a.2. Chlorine [outdoor] process pipe breach	4	40	12-inch diameter pipe	3	16.68 (1.15 bar)	--	0.13	43.1	Cl_2
1.a.3 Chlorine [outdoor] process pipe breach [seismic event]	4	40	12-inch diameter pipe	3	16.68 (1.15 bar)	--	0.26	86.2	Cl_2
1.b. Intermixing of Hypochlorite with HCl	4	Ambient		3	Ambient	–	0.054	18.1	Cl_2
Onsite Hazardous Material (Liquid)									
2.a Vessel Failure: Onsite NaOH storage tank	1	Ambient		10	Ambient	20,300 (77)		(a)	NaOH
2.b Vessel Failure: Onsite HCl storage tank	1	Ambient		10	Ambient	400,000 (1,514)		53.0	HCl
2.c. Vessel Failure: Onsite hypochlorite tank	1	Ambient		10	Ambient	187,000 (708)		13.2	Cl_2O
Offsite Fixed Facility Scenarios									
5.a Offsite caustic pipeline breach	1	Ambient		10	Ambient	9,640 (36)		(a)	NaOH
5.b Offsite EISL facility caustic tank breach	1	Ambient		10	Ambient	2.5 million (9,464)		(a)	NaOH
Offsite Transportation Scenarios									
6.a Hydrochloric acid: tank truck accident	1	Ambient		10	Ambient	4,000 (15)		89.0	HCl
6.b Hypochlorite (bleach product): tank truck accident	1	Ambient		10	Ambient	4,000 (15)		48.0	Cl_2O

[a] According to the April 1999 U.S. EPA Guidance Document on accidental release modelling (U.S. Environmental Protection Agency 1999), toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 millimetres of mercury (mm Hg.). The vapour pressure of 50% sodium hydroxide solution at ambient temperature (20 degrees C) is approximately 1.5 mm Hg and the vapour pressure is approximately 6 mm Hg at a temperature of 40 degrees C (FMC Corporation 2004). Therefore potential air emissions from liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

The vapour over a 12.5 percent sodium hypochlorite solution contains hypochlorous acid and chlorine monoxide. (The Chloride Institute 2006). For the purposes of accidental release modelling the vapour devolved from the liquid sodium hypochlorite release is assumed to be chlorine monoxide.

Table 4.2-2. Accident Scenario Information – Flammable Gas Release and Fire and Explosion Scenarios

Description Accidental Release Scenario	Release height (m)	Release temp (° C)	Release velocity	Release pressure (psia)	Release duration (min.)	Total Release H_2 / CH_4 (m^3)	Flammable Gas Released
Flammable Gas Release Scenarios							
3.a.1 Hydrogen [indoor] process pipe breach	1	Ambient	100,000 Nm^3/hr ambient air	Ambient	3	0.004	H_2
3.a.2. Hydrogen [outdoor] process pipe breach	4	87	12 inch (30-cm) diameter pipe	17.11 (1.18 bar)	3	0.004	H_2
3.a.3 Hydrogen [outdoor] process pipe breach [seismic event]	4	87	12 inch (30-cm) diameter pipe	17.11 (1.18 bar)	3	0..008	H_2
3.b.1 Hydrogen stack release (un-combusted H_2)	10	87	200 Nm^3/hr N_2 + 15 Nm^3 H_2	Ambient	30	15	H_2
3.b.2 HCl scrubber outlet (un-combusted H_2)	29	40	200 Nm^3/hr N_2 + 15 Nm^3 H_2	Ambient	30	15	H_2
4.a Onsite Natural (CH_4 release)	1	Ambient		15.7	Inst.	0.222	CH_4
4.b Offsite Natural gas deflagration	1	Ambient		365	Inst.	0.65	CH_4

Table 4.2-3. Intermediate and Product Storage Tank Containment Volumes

Storage Tank	Storage Tank Volume (Gallons) (Litres)	Containment Volume (Gallons) (Litres)	Containment Height (Feet) (Metres)	Containment Area (Square Feet) (Square Metres)
Onsite NaOH	20,300 (77)	22,330 (77)	6 (1.8)	498 (46)
Onsite Hypochlorite	187,000 (708)	205,700 (779)	6 (1.8)	4,584 (426)
Onsite HCl	400,000 (1,514)	440,000 (1,666)	6 (1.8)	9,803 (911)
Offsite NaOH	2,500,000 (9,464)	2,750,000 (10,410)	6 (1.8)	61,270 (5,692)

Containment Volumes are estimated based on 110 percent of the total storage tank volume and a containment system height of 6 feet (1.8 m).

5.0 HAZARDS AND CONSEQUENCE ANALYSIS

5.1 SCENARIO INFORMATION

For each scenario, the ALOHA model was run twice to take account of variations arising from differing conditions in the Trinidadian wet season and dry season. The model requires the prevailing weather conditions of each season to be entered into the model as assumptions. Wet season conditions were assumed to be those of August 1, 2007, at midday, that is:

- Air temperature of 28.3 °C
- Cloud coverage of 80 percent
- Humidity level at 80 percent
- Wind speed of 1.5 m/s from the south, measured at 3 m above ground level

Dry season conditions were assumed to be those of August 1, 2007, at midday, that is:

- Air temperature of 26.3 °C
- Cloud coverage of 30 percent
- Humidity level at 70 percent
- Wind speed of 1.5 m/s from the south, measured at 3 m above ground level

5.2 HAZARDS AND CONSEQUENCE ANALYSIS

5.2.1 Onsite Hazardous Material (Gaseous) Release

The model used was ALOHA.

With the wind blowing from the south, a plume of chlorine gas would be propagated northwards from the point of release.

Two sets of modelling runs were conducted for the chlorine gas release scenarios. The first set of modelling runs shows one "threat zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 30 mg/m^3, the IDLH value for chlorine (see Table 1.5-6.)

For the second set of modelling runs for the chlorine gas release scenarios, the output figure shows three "threat zones." The red zone is the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed 300 mg/m^3. Similarly, the concentration of chlorine gas within the orange zone would reach or exceed 200 mg/m^3, and the concentration of chlorine gas within the yellow zone would reach or exceed 100 mg/m^3.

The output figure of each model run also shows "confidence lines" for each threat zone. These lines describe a fan-shaped sector within which one can be 95 percent confident that the threat zone will occur, should the release happen.

5.2.1.1 Scenario 1.a. Chlorine [indoor and outdoor] process pipe breach (Cl_2 release)

The worst case was modelled, equivalent to a release rate of approximately 95 pounds per minute for 3 minutes for a total release of 285 pounds (129 kilograms) of chlorine (CariSal Limited 2007). Air exchange rate is given for the point of release rather than downwind receptors.

Scenario 1. a.1 Indoor Release Scenario

Modelling assumptions:

Both Seasons

The 285 pounds (129 kilograms) of chlorine are released within the cell room over a 3-minute period at a pressure of 3.96 psig (1.25 bar) and are entrained in the cell room ventilation (ambient air) system and exhausted to the atmosphere. The estimated exhaust gas flow rate from the cell-room vent is approximately 100,000 Nm^3/hr.

Wet Season

Building air exchanges per hour number 0.42 (for an unsheltered single-storied building).
Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 0.41 (for an unsheltered single-storied building)
Weather conditions as described in Section 5.1.

Modelling results (30 mg/m^3 chlorine IDLH concentration threshold)

Wet Season and Dry Season

Figures 5.2-1a and 5.2. 1b show that the:

- Red Zone would extend 1,500 m (1.5 km) from the cell room vent;
- The confidence lines describe an angle of approximately 60 degrees.

Modelling results (300 mg/m^3, 200 mg/m^3, 100 mg/m^3 chlorine concentration thresholds)

Wet Season

Figures 5.2-2a and 5.2-2b show that the:

- Red Zone would extend 457 m from the cell room vent;
- Orange Zone would extend 553 m from the cell room vent;
- Yellow Zone would extend 806 m from the cell room vent;
- The confidence lines describe an angle of approximately 60 degrees.

Dry Season

Figures 5.2-3a and 5.2-3b shows that the:

- Red Zone would extend 360 m from the cell room vent;
- Orange Zone would extend 435 m from the cell room vent;
- Yellow Zone would extend 63 8 m from the cell room vent;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

Scenario 1.a.2 Outdoor Release Scenario

Modelling assumptions:

Both Seasons

The 285 pounds (129 kilograms] of chlorine are released to the atmosphere over a 3-minute period at a pressure of 3.96 psig (1.25 bar). The release occurs as an elevated release, at a height of 4 m. (The chlorine that is purged to the bleach plant through the dry compressed air purge system is completely absorbed and no residual chlorine is emitted to the atmosphere from this event.)

Wet Season

Weather conditions as described in Section 5.1.

Dry Season

Weather conditions as described in Section 5.1.

Modelling results (30 mg/m^3 Chlorine IDLH threshold)

Wet Season and Dry Season

Figures 5.2-4a and 5.4-4b show that the:

- Red Zone would extend 1,500 m (1.5 km) from the point of release;
- The confidence lines describe an angle of approximately 60 degrees.

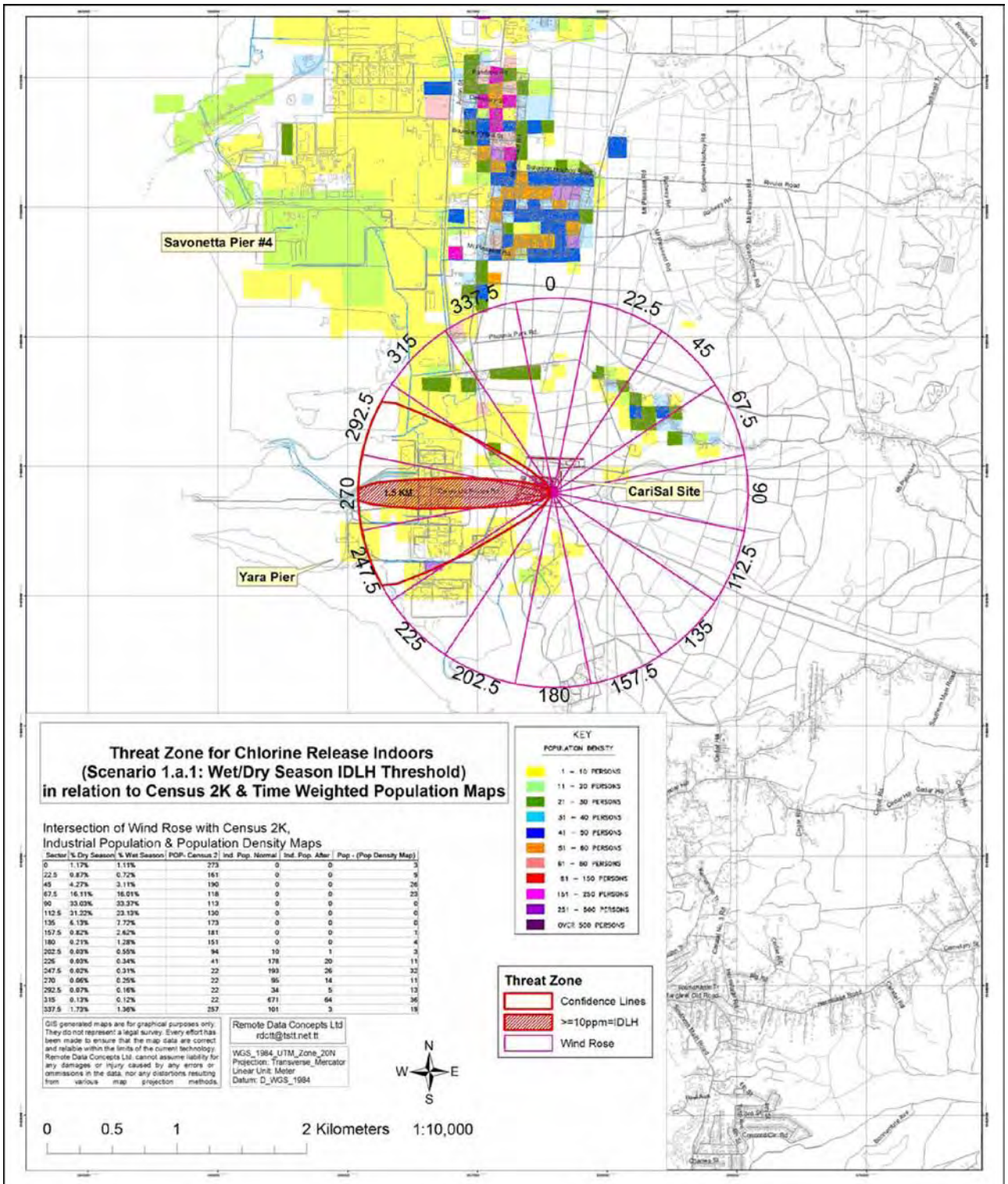
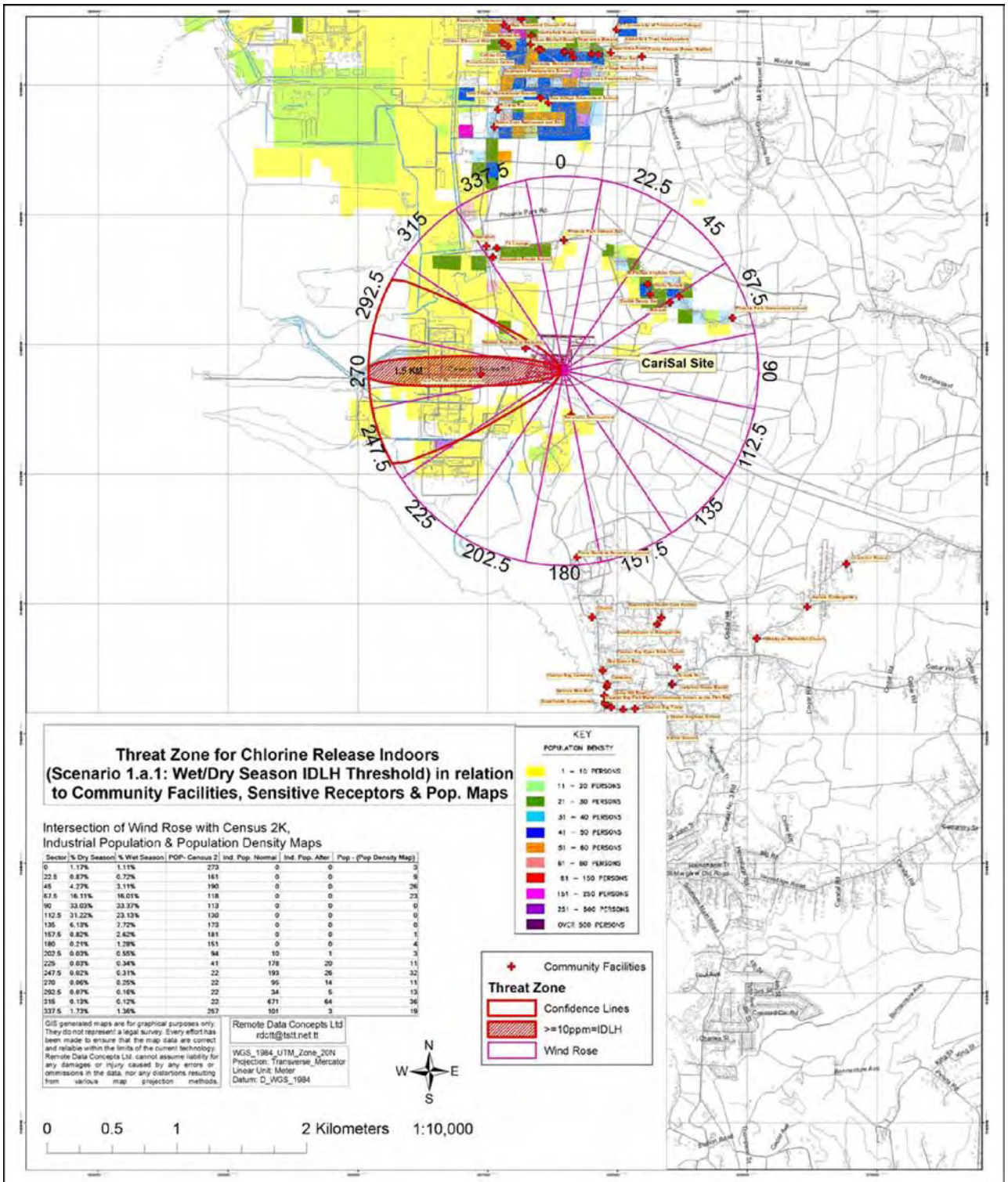


Figure 5.2-1a. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet/Dry Season, IDLH Threshold) in relation to time-weighted population.



Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop - (Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	161	0	0	9
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure 5.2-1 b. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet/Dry Season, IDLH Threshold) in relation to community facilities and sensitive receptors.

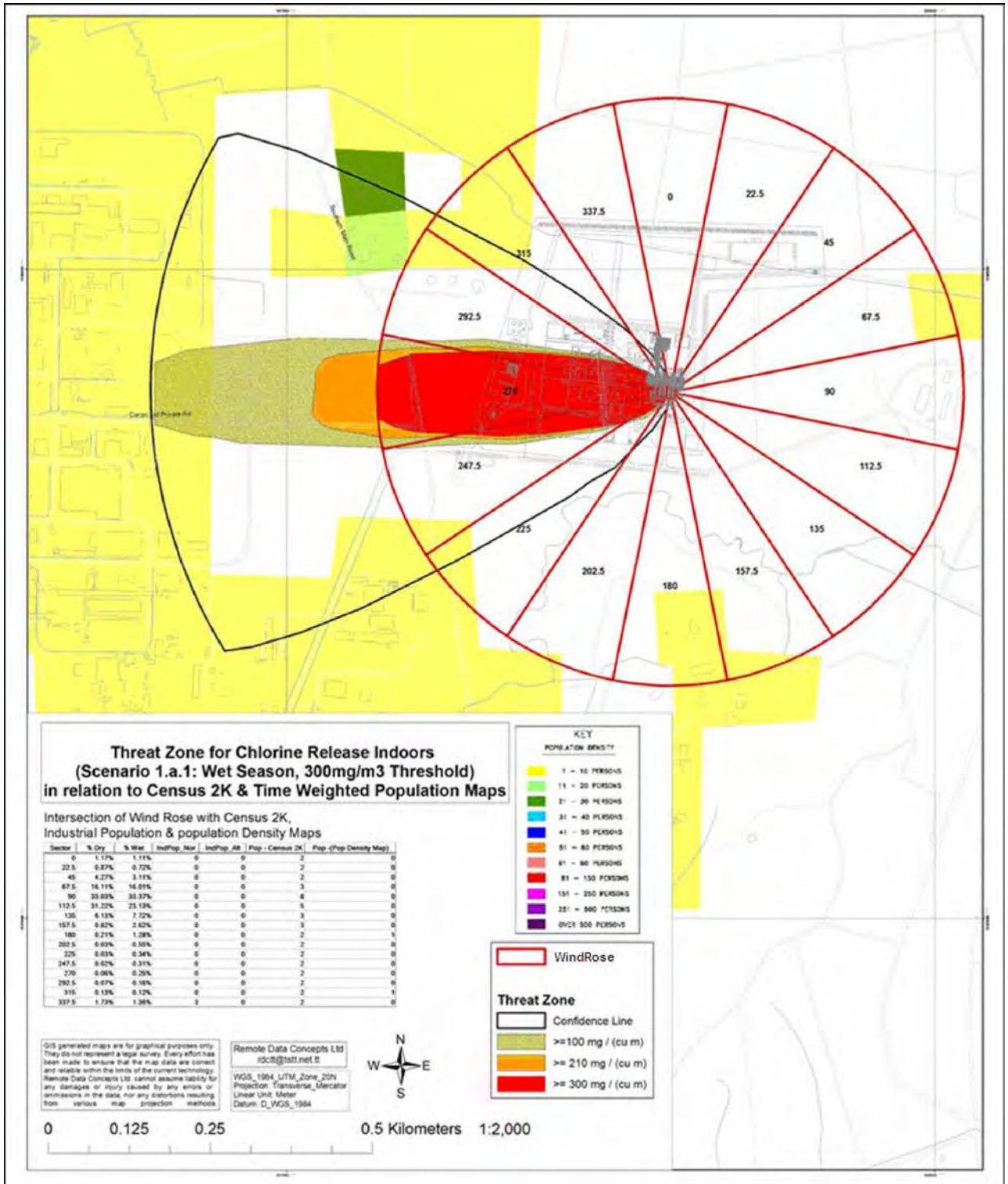
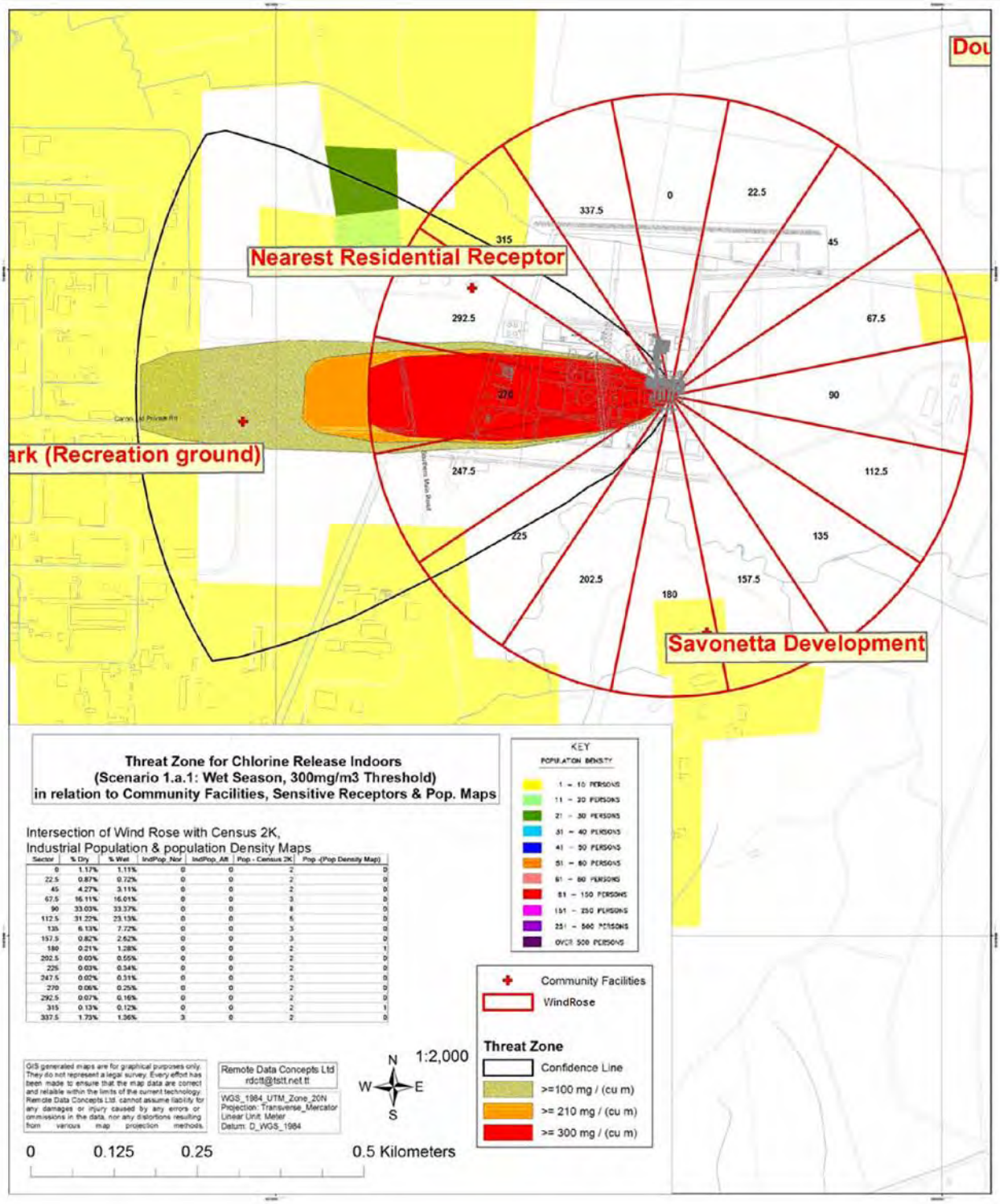


Figure 5.2-2a. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet Season, 300



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop -(Pop Density Map)
0	1.17%	1.11%	0	0	2	0
22.5	0.87%	0.72%	0	0	2	0
45	4.27%	3.11%	0	0	2	0
67.5	16.11%	16.01%	0	0	3	0
90	33.03%	33.37%	0	0	8	0
112.5	31.22%	23.13%	0	0	5	0
135	6.13%	7.72%	0	0	3	0
157.5	0.82%	2.62%	0	0	3	0
180	0.21%	1.28%	0	0	2	1
202.5	0.03%	0.55%	0	0	2	0
225	0.03%	0.34%	0	0	2	0
247.5	0.02%	0.31%	0	0	2	0
270	0.06%	0.25%	0	0	2	0
292.5	0.07%	0.16%	0	0	2	0
315	0.13%	0.12%	0	0	2	1
337.5	1.73%	1.36%	3	0	2	0

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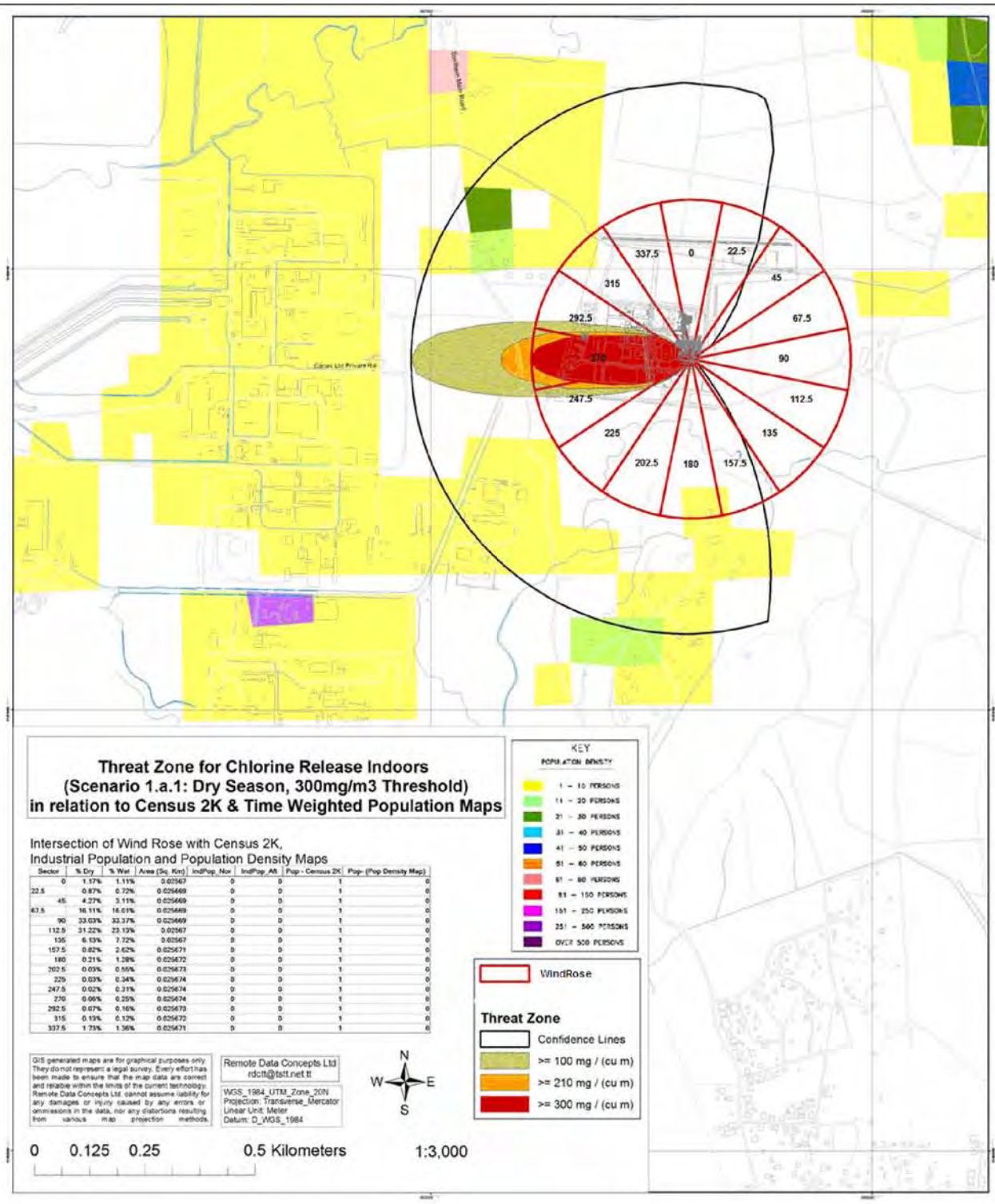
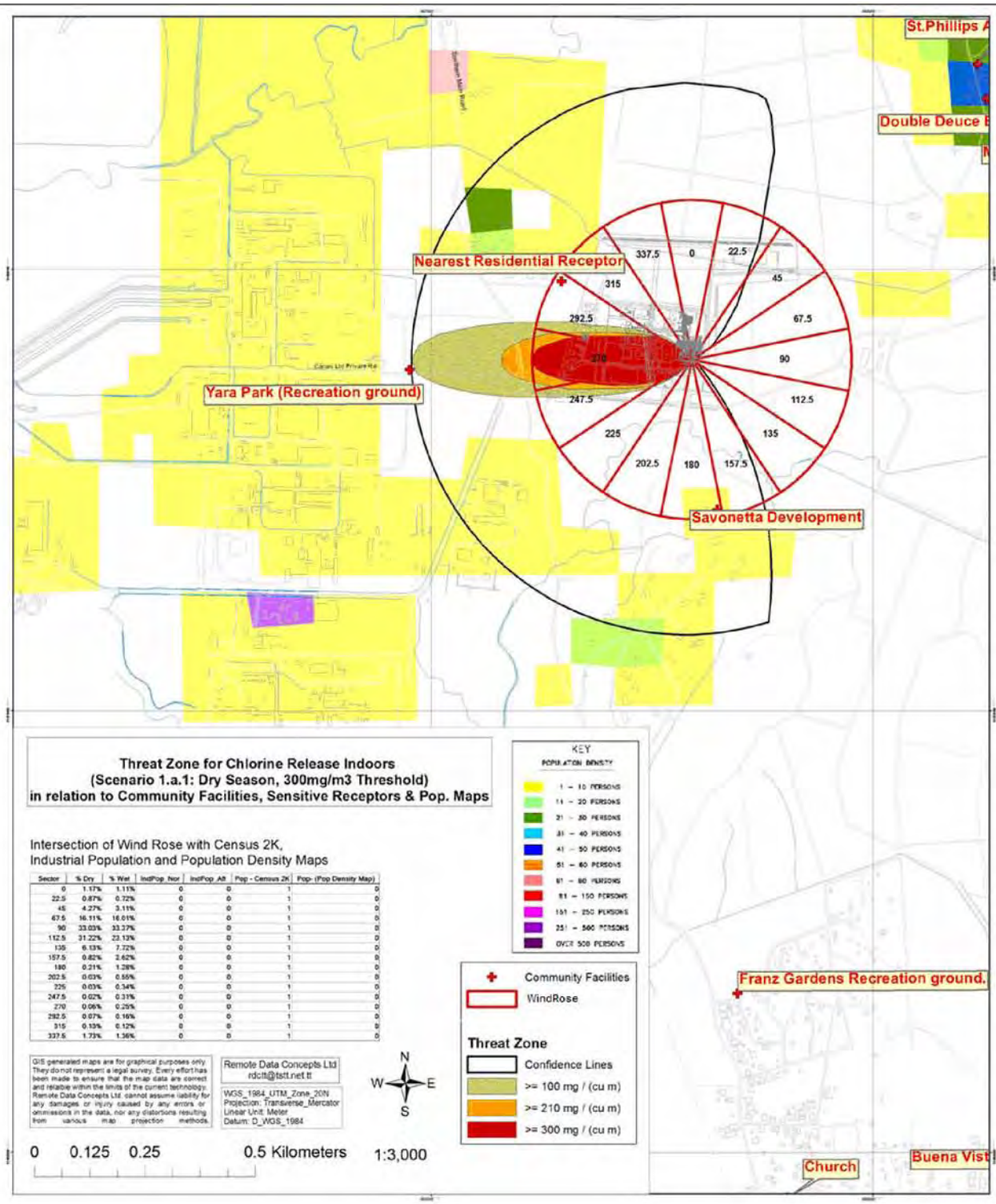
Figure 5.2-2b. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet Season, 300 mg/m³ Threshold) in relation to community facilities and sensitive receptors.



Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop- (Pop Density Map)
0	1.17%	1.11%	0.02567	0	0	1	0
22.5	0.87%	0.72%	0.025669	0	0	1	0
45	4.27%	3.11%	0.025669	0	0	1	0
67.5	16.11%	16.01%	0.025669	0	0	1	0
90	33.03%	33.37%	0.025669	0	0	1	0
112.5	31.22%	23.13%	0.02567	0	0	1	0
135	6.13%	7.72%	0.02567	0	0	1	0
157.5	0.82%	2.62%	0.025671	0	0	1	0
180	0.21%	1.28%	0.025672	0	0	1	0
202.5	0.03%	0.55%	0.025673	0	0	1	0
225	0.03%	0.34%	0.025674	0	0	1	0
247.5	0.02%	0.31%	0.025674	0	0	1	0
270	0.06%	0.25%	0.025674	0	0	1	0
292.5	0.07%	0.16%	0.025673	0	0	1	0
315	0.13%	0.12%	0.025672	0	0	1	0
337.5	1.73%	1.36%	0.025671	0	0	1	0

Figure 5.2-3a. Threat zone for chlorine release, indoors (Scenario 1.a.1: Dry Season, 300 mg/m³ Threshold) in relation to time-weighted population.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop- (Pop Density Map)
0	1.17%	1.11%	0	0	1	0
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.12%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	0
315	0.13%	0.12%	0	0	1	0
337.5	1.73%	1.36%	0	0	1	0

Figure 5.2-3b. Threat zone for chlorine release, indoors (Scenario 1.a.1: Dry Season, 300 mg/m³ Threshold) in relation to community facilities and sensitive receptors.

Modelling results (300 mg/m³, 200 mg/m³, 100 mg/m³ chlorine concentration thresholds)

Wet Season

Figures 5.2-5a and 5.2-5b show that the:

- Red Zone would extend 454 m from the point of release;
- Orange Zone would extend 550 m from the point of release;
- Yellow Zone would extend 799 m from the point of release;
    - The confidence lines describe an angle of approximately 60

degrees. *Dry Season*

Figures 5.2-6a and 5.2-6b shows that the:

- Red Zone would extend 365 m from the point of release;
- Orange Zone would extend 440 m from the point of release;
- Yellow Zone would extend 643 m from the point of release;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

Scenario 1. a.3 Outdoor Release Scenario (seismic event)

Modelling assumptions:

Both Seasons

The 285 pounds (129 kilograms) of chlorine are released to the atmosphere over a 3-minute period at a pressure of 3.96 psig (1.25 bar) from *each* of the two electrolysis units, for a combined release of 570 pounds (259 kg) of chlorine. The release occurs as an elevated release, at a height of 4 m. (The chlorine that is purged to the bleach plant through the dry compressed air purge system is completely absorbed and no residual chlorine is emitted to the atmosphere from this event.)

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

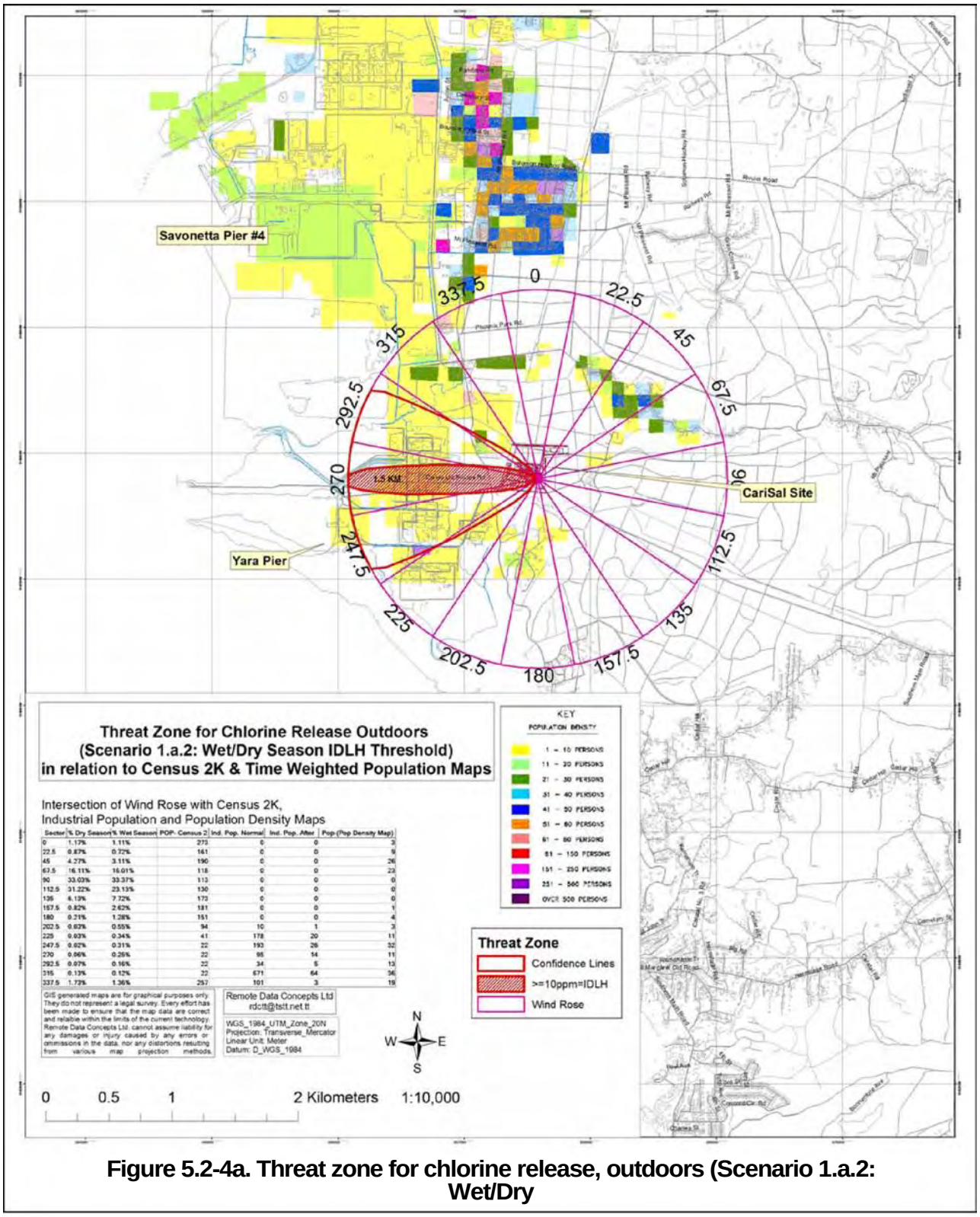
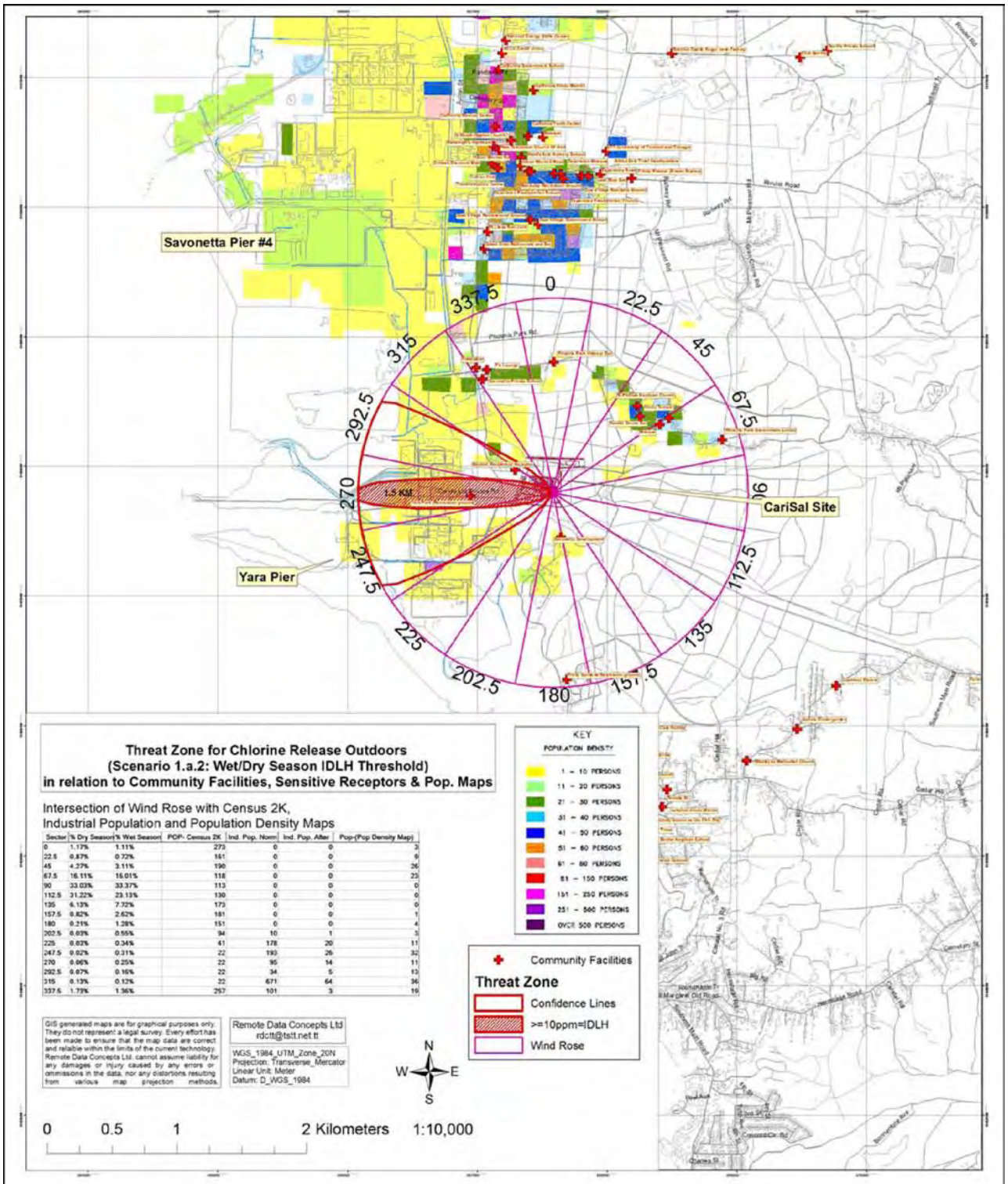
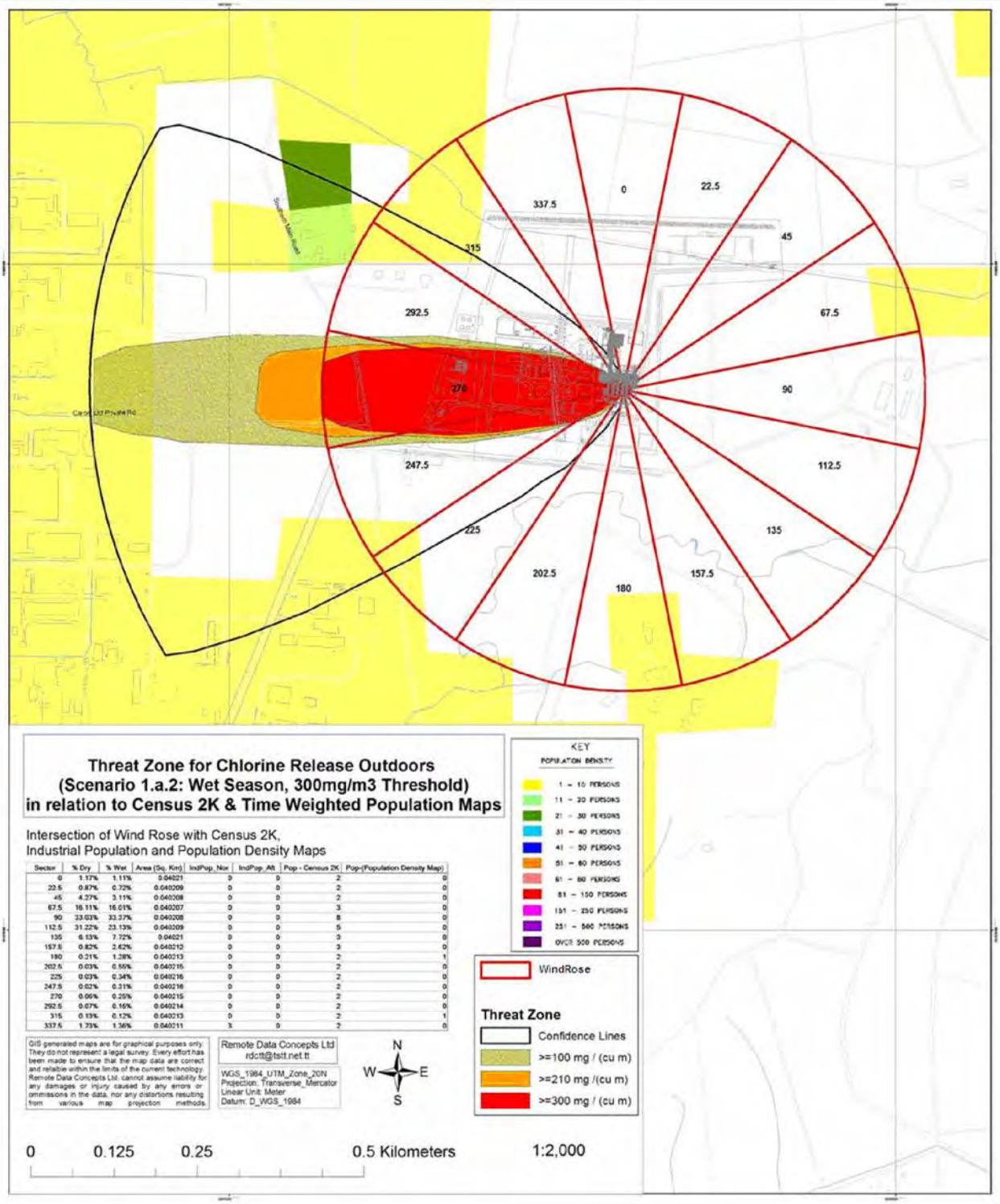


Figure 5.2-4a. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet/Dry



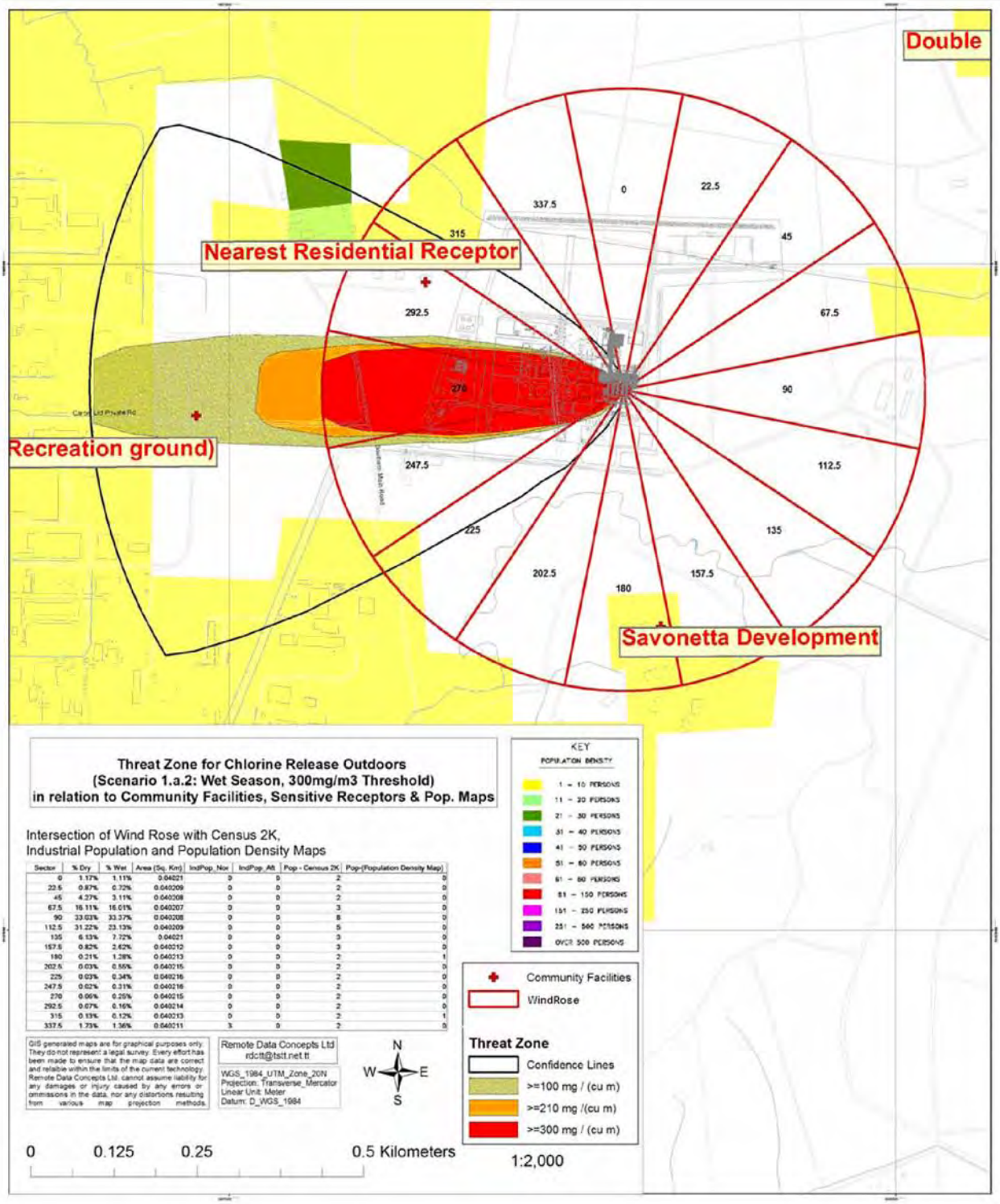
Sector	% Dry Season	% Wet Season	POP- Census 2K	Ind. Pop. Norm	Ind. Pop. After	Pop-(Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	151	0	0	6
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure 5.2-4b. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet/Dry Season, IDLH Threshold) in relation to community facilities and sensitive



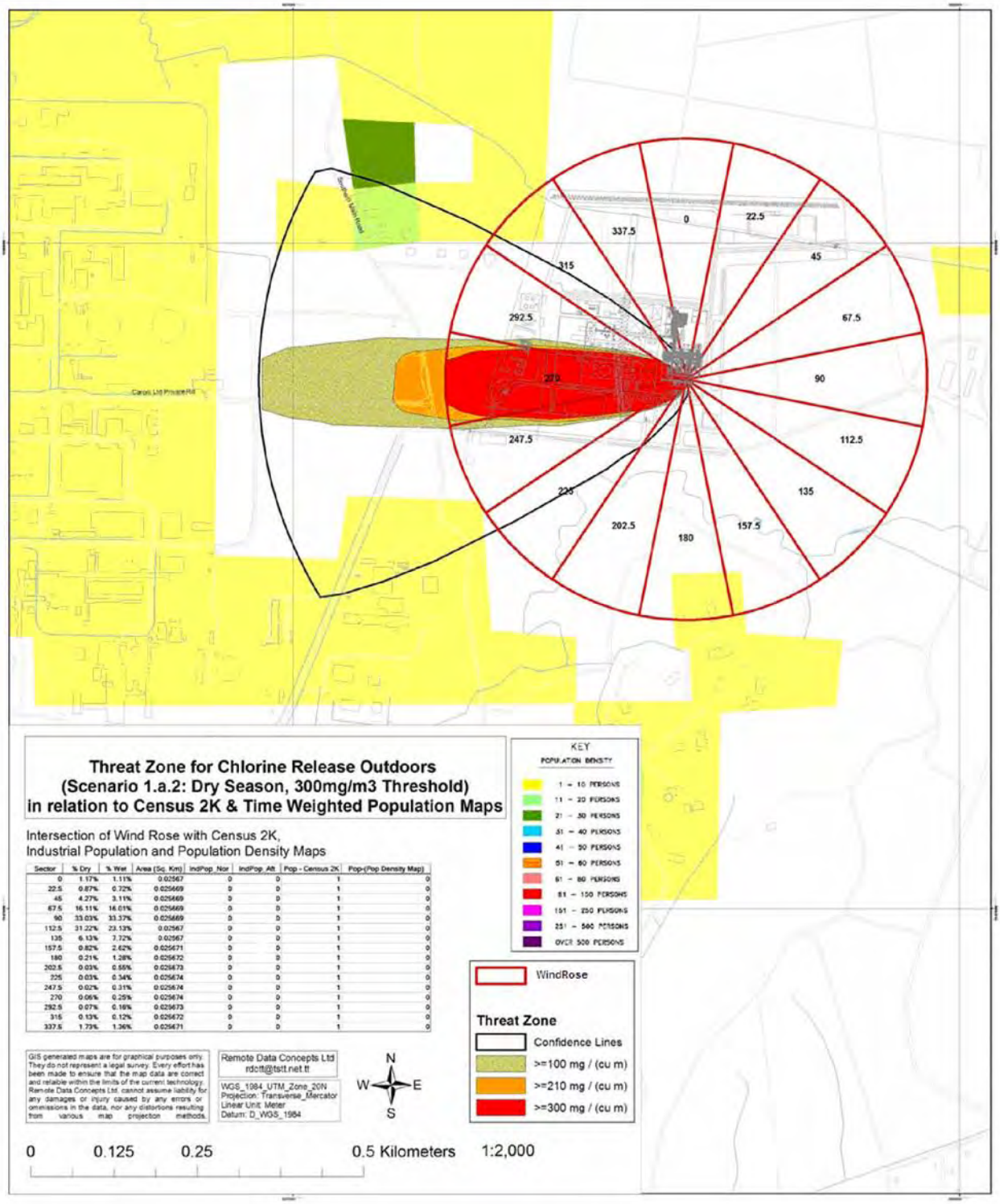
Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nox	IndPop_Alt	Pop - Census 2K	Pop-(Population Density Map)
0	1.17%	1.11%	0.04021	0	0	2	0
22.5	0.87%	0.72%	0.040009	0	0	2	0
45	4.27%	3.11%	0.040008	0	0	2	0
67.5	16.11%	16.01%	0.040007	0	0	3	0
90	33.03%	33.37%	0.040008	0	0	8	0
112.5	31.22%	23.13%	0.040009	0	0	5	0
135	6.13%	7.72%	0.04021	0	0	3	0
157.5	0.82%	2.62%	0.040012	0	0	3	0
180	0.21%	1.28%	0.040013	0	0	2	1
202.5	0.03%	0.55%	0.040015	0	0	2	0
225	0.03%	0.34%	0.040016	0	0	2	0
247.5	0.02%	0.31%	0.040016	0	0	2	0
270	0.06%	0.25%	0.040015	0	0	2	0
292.5	0.07%	0.16%	0.040014	0	0	2	0
315	0.13%	0.12%	0.040013	0	0	2	1
337.5	1.73%	1.36%	0.040011	3	0	2	0

Figure 5.2-5a. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet Season,



Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Population Density Map)
0	1.17%	1.11%	0.04021	0	0	2	0
22.5	0.87%	0.72%	0.040209	0	0	2	0
45	4.27%	3.11%	0.040208	0	0	2	0
67.5	16.11%	16.01%	0.040207	0	0	3	0
90	33.03%	33.37%	0.040208	0	0	8	0
112.5	31.22%	23.13%	0.040209	0	0	5	0
135	6.13%	7.72%	0.04021	0	0	3	0
157.5	0.82%	2.62%	0.040212	0	0	3	0
180	0.21%	1.28%	0.040213	0	0	2	1
202.5	0.03%	0.55%	0.040215	0	0	2	0
225	0.03%	0.34%	0.040216	0	0	2	0
247.5	0.02%	0.31%	0.040216	0	0	2	0
270	0.06%	0.25%	0.040215	0	0	2	0
292.5	0.07%	0.16%	0.040214	0	0	2	0
315	0.13%	0.12%	0.040213	0	0	2	1
337.5	1.73%	1.36%	0.040211	3	0	2	0

Figure 5.2-5b. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet Season,



Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0.02567	0	0	1	0
22.5	0.87%	0.72%	0.025669	0	0	1	0
45	4.27%	3.11%	0.025669	0	0	1	0
67.5	16.11%	16.01%	0.025669	0	0	1	0
90	33.03%	33.37%	0.025669	0	0	1	0
112.5	31.22%	23.13%	0.02567	0	0	1	0
135	6.13%	3.72%	0.02567	0	0	1	0
157.5	0.82%	2.62%	0.025671	0	0	1	0
180	0.21%	1.28%	0.025672	0	0	1	0
202.5	0.03%	0.55%	0.025673	0	0	1	0
225	0.03%	0.34%	0.025674	0	0	1	0
247.5	0.02%	0.31%	0.025674	0	0	1	0
270	0.06%	0.25%	0.025674	0	0	1	0
292.5	0.07%	0.16%	0.025673	0	0	1	0
315	0.13%	0.12%	0.025672	0	0	1	0
337.5	1.73%	1.36%	0.025671	0	0	1	0

Figure 5.2-6a. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Dry Season, 300

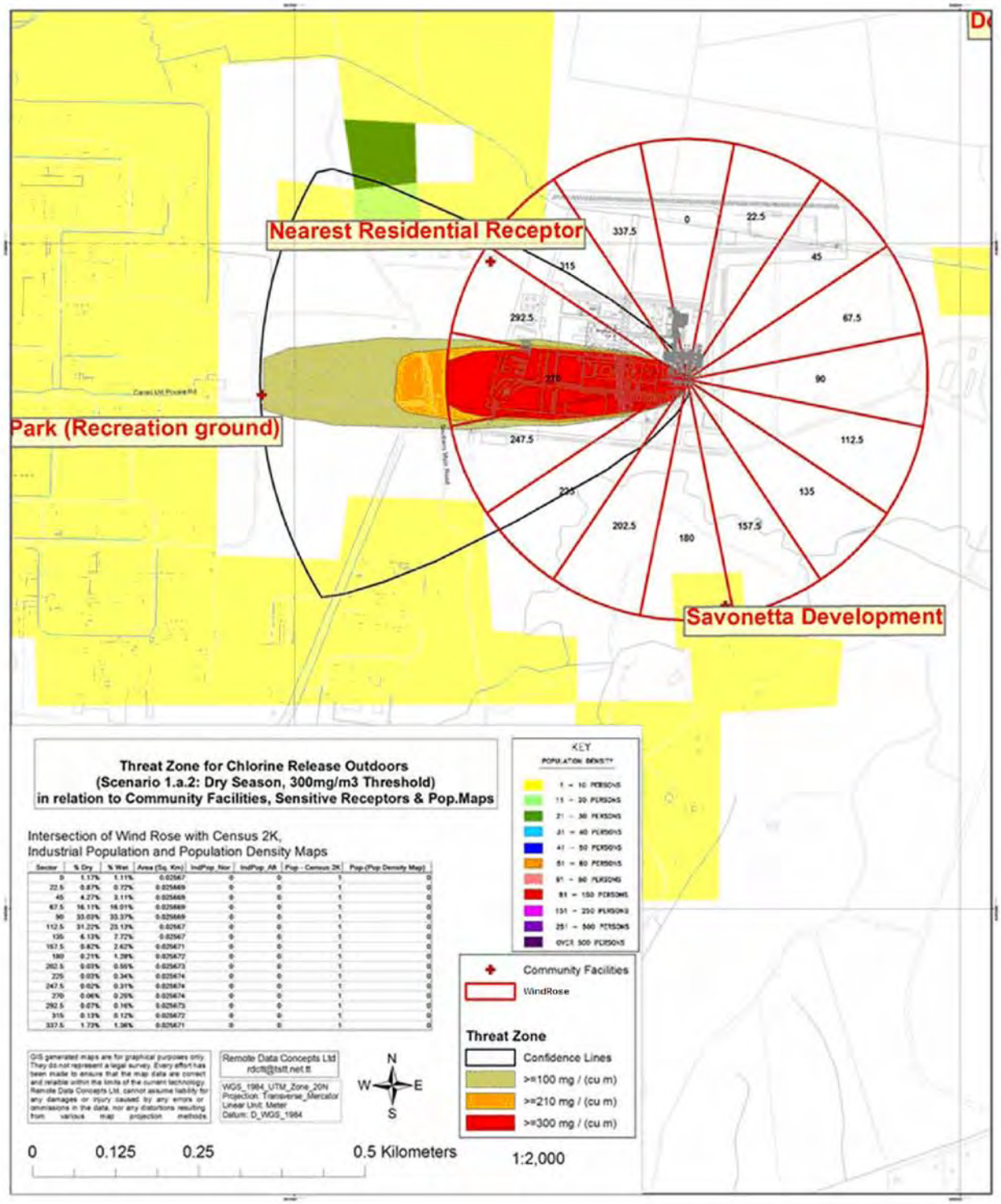


Figure 5.2-6b. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Dry Season, 300 mg/m3 Threshold) in relation to community facilities and sensitive receptors.

Modelling results (30 mg/m^3 Chlorine IDLH threshold)

Wet Season and Dry Season

Figures 5.2-7a and 5.2-7b show that the:

- Red Zone would extend 1,800 m (1.8 km) from the point of release;
- The confidence lines describe an angle of approximately 80 degrees.

Modelling results (300 mg/m^3, 200 mg/m^3, 100 mg/m^3 chlorine concentration thresholds)

Wet Season and Dry Season

Figures 5.2-8a and 5.2-8b show that the:

- Red Zone would extend 593 m from the point of release;
- Orange Zone would extend 707 m from the point of release;
- Yellow Zone would extend 1000 m from the point of release;
- The confidence lines describe an angle of approximately 80 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

5.2.1.2 Scenario 1.b. Intermixing of Hypochlorite with HCl (Cl_2 release)

Modelling assumptions:

Both Seasons

The 120 pounds (54 kilograms) of chlorine gas from the reaction of hypochlorite with the hydrochloric acid are released to the atmosphere over a 3-minute period. The release occurs as an elevated release, at a height of 4 m.

(The inadvertent mixing scenario has been modelled in the Risk Assessment to estimate the potential consequences of an event; however, the risk assessment analysis would then assign the scenario an appropriately low probability of occurrence commensurate with the planned installation of dedicated nozzles.)

Wet Season

Building air exchanges per hour number 60 (specified by user)

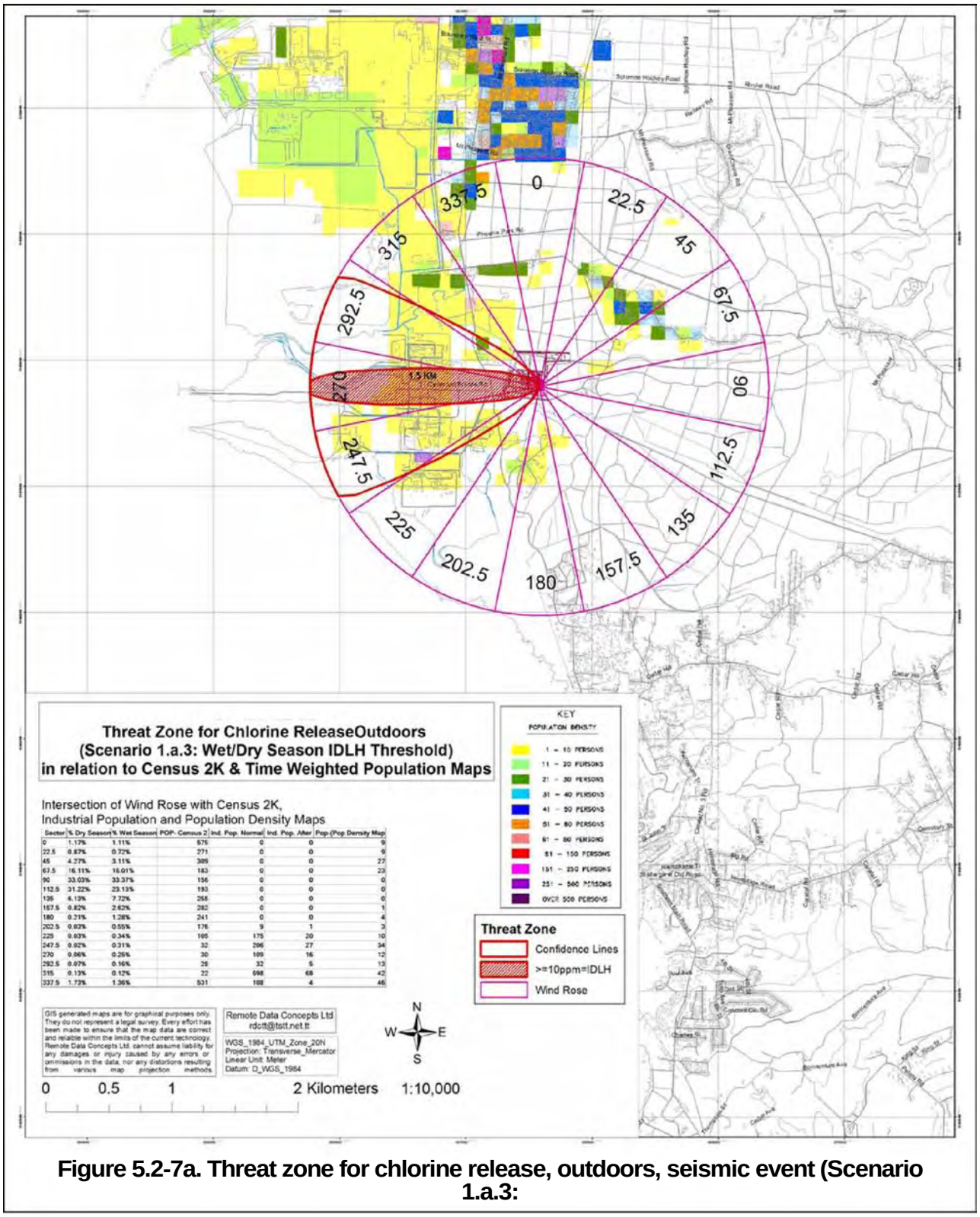
Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

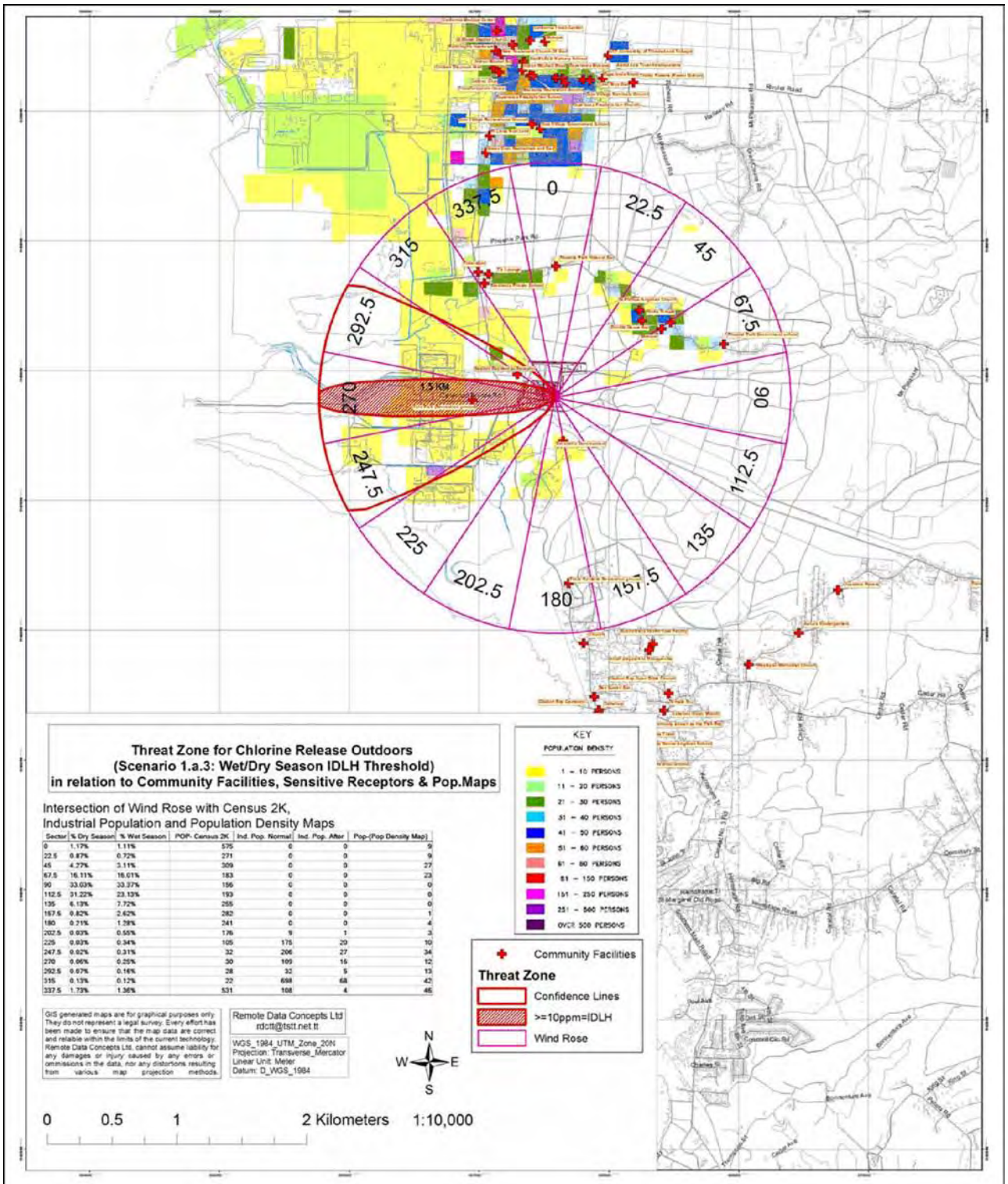
Weather conditions as described in Section 5.1.

Modelling results (30 mg/m^3 chlorine IDLH concentration threshold)



Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop.(Pop Density Map
0	1.17%	1.11%	575	0	0	9
22.5	0.87%	0.72%	271	0	0	9
45	4.27%	3.11%	309	0	0	27
67.5	16.11%	16.01%	183	0	0	23
90	33.03%	33.37%	156	0	0	0
112.5	21.22%	23.13%	193	0	0	0
135	6.13%	7.72%	256	0	0	0
157.5	0.82%	2.62%	282	0	0	1
180	0.21%	1.28%	241	0	0	4
202.5	0.02%	0.55%	176	9	1	3
225	0.03%	0.34%	195	175	20	10
247.5	0.02%	0.31%	32	206	27	34
270	0.06%	0.26%	30	169	16	12
292.5	0.07%	0.16%	28	32	5	13
315	0.13%	0.12%	22	698	68	42
337.5	1.72%	1.36%	531	108	4	46

Figure 5.2-7a. Threat zone for chlorine release, outdoors, seismic event (Scenario 1.a.3:



Sector	% Dry Season	% Wet Season	POP- Census 2K	Ind. Pop. Normal	Ind. Pop. After	Pop-(Pop Density Map)
0	1.17%	1.11%	575	0	0	9
22.5	0.87%	0.72%	271	0	0	9
45	4.27%	3.11%	309	0	0	27
67.5	16.11%	16.01%	183	0	0	23
90	33.03%	33.37%	156	0	0	0
112.5	31.22%	23.13%	193	0	0	0
135	6.13%	7.72%	255	0	0	0
157.5	0.82%	2.62%	282	0	0	1
180	0.71%	1.28%	241	0	0	4
202.5	0.03%	0.55%	176	9	1	3
225	0.03%	0.34%	105	175	20	10
247.5	0.02%	0.31%	32	206	27	34
270	0.06%	0.25%	30	109	15	12
292.5	0.07%	0.16%	28	32	5	13
315	0.13%	0.12%	22	698	68	42
337.5	1.73%	1.36%	531	108	4	46

Figure 5.2-7b. Threat zone for chlorine release, outdoors, seismic event (Scenario 1.a.3:
Wet/Dry Season, IDLH Threshold) in relation to community facilities and sensitive

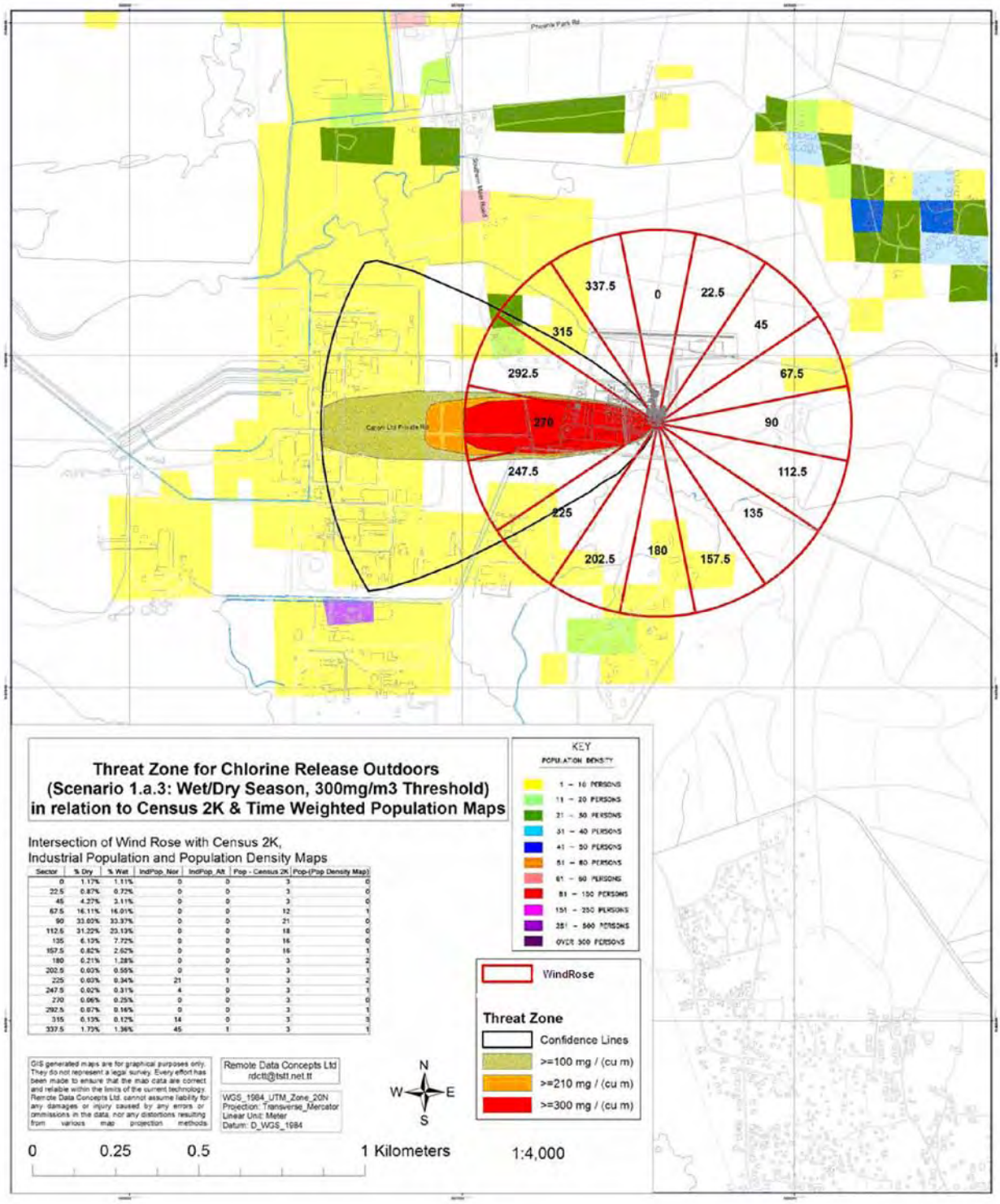


Figure 5.2-8a. Threat zone for chlorine release, outdoors (Scenario 1.a.3: Wet/Dry

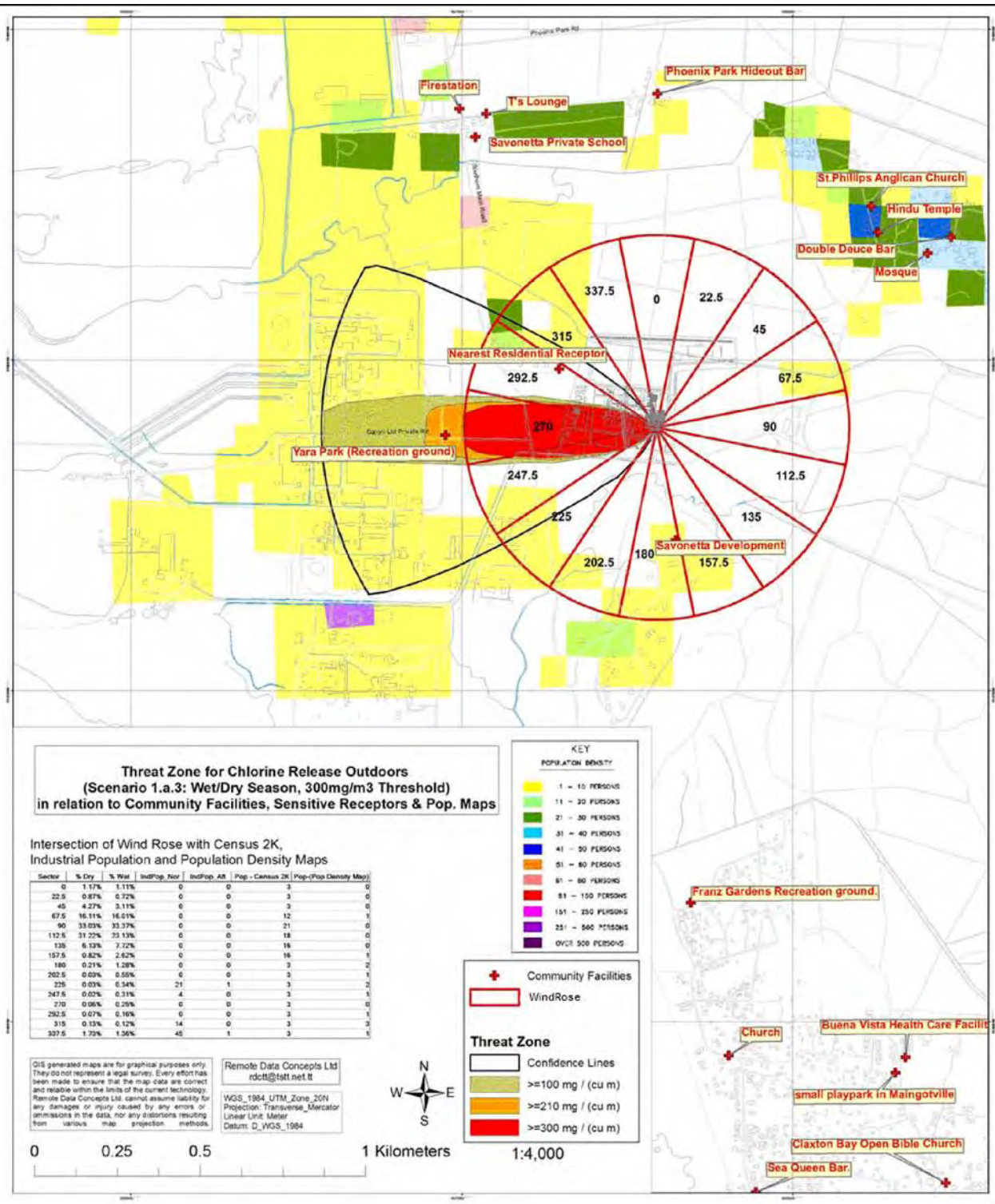


Figure 5.2-8b. Threat zone for chlorine release, outdoors (Scenario 1.a.3: Wet/Dry Season, 300 mg/m³ Threshold) in relation to community facilities and sensitive receptors.

Wet Season

Figures 5.2-9a and 5.2-9b show that the:

- Red Zone would extend 987 m from the tank truck vent;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

Dry Season

Figures 5.2-10a and 5.2-10b show that the:

- Red Zone would extend 977 m from the tank truck vent;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1

Modelling results (300 mg/m^3, 200 mg/m^3, 100 mg/m^3 chlorine concentration thresholds)

Wet Season

Figures 5.2-11 a and 5.2-1 1b show that the:

- Red Zone would extend 311 m from the tank truck vent;
- Orange Zone would extend 3 87 m from the tank truck vent;
- Yellow Zone would extend 596 m from the tank truck vent;
- The confidence lines describe an angle of approximately 60 degrees.

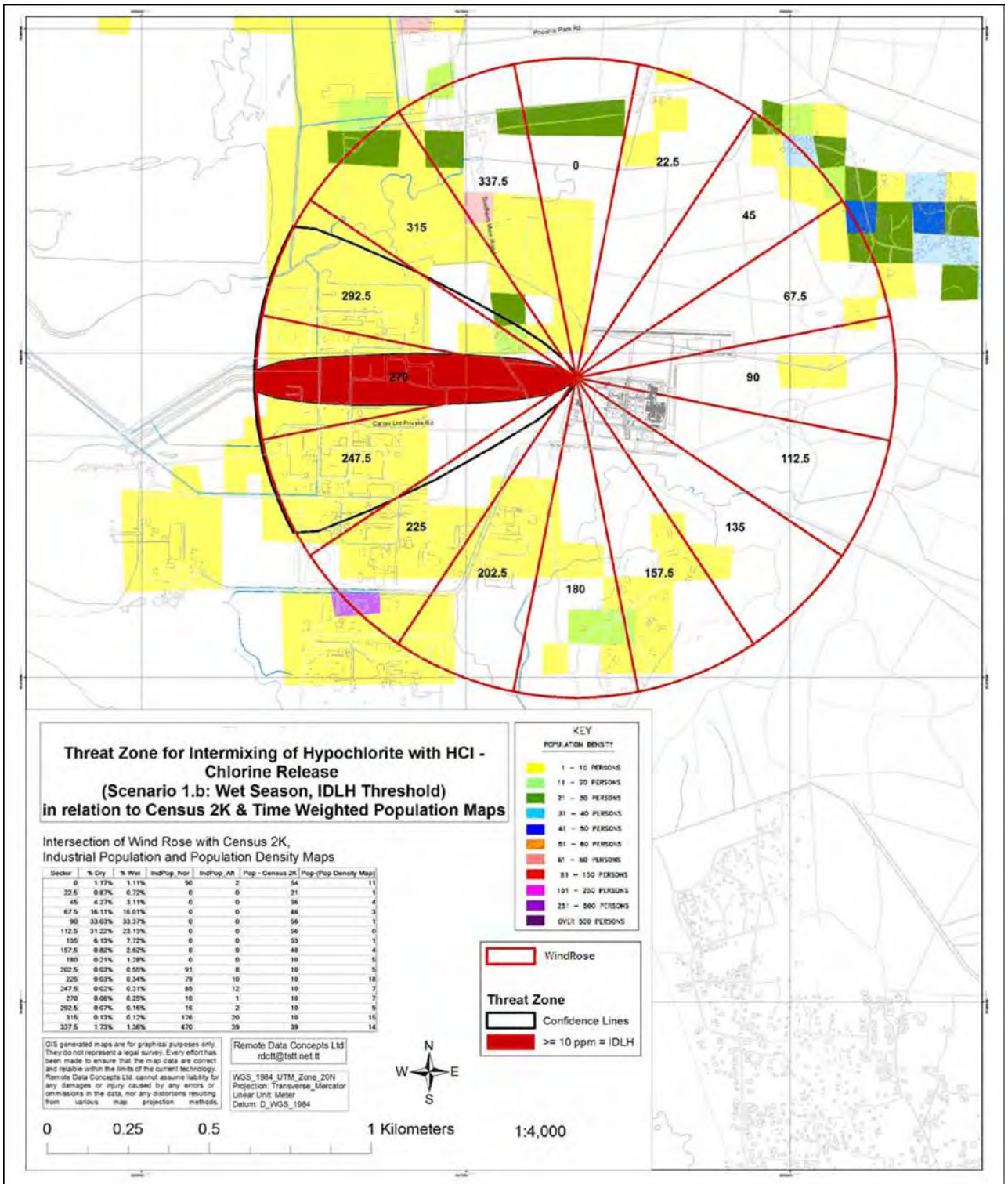
A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

Dry Season

Figures 5.2-11 a and 5.2-1 1b shows that the:

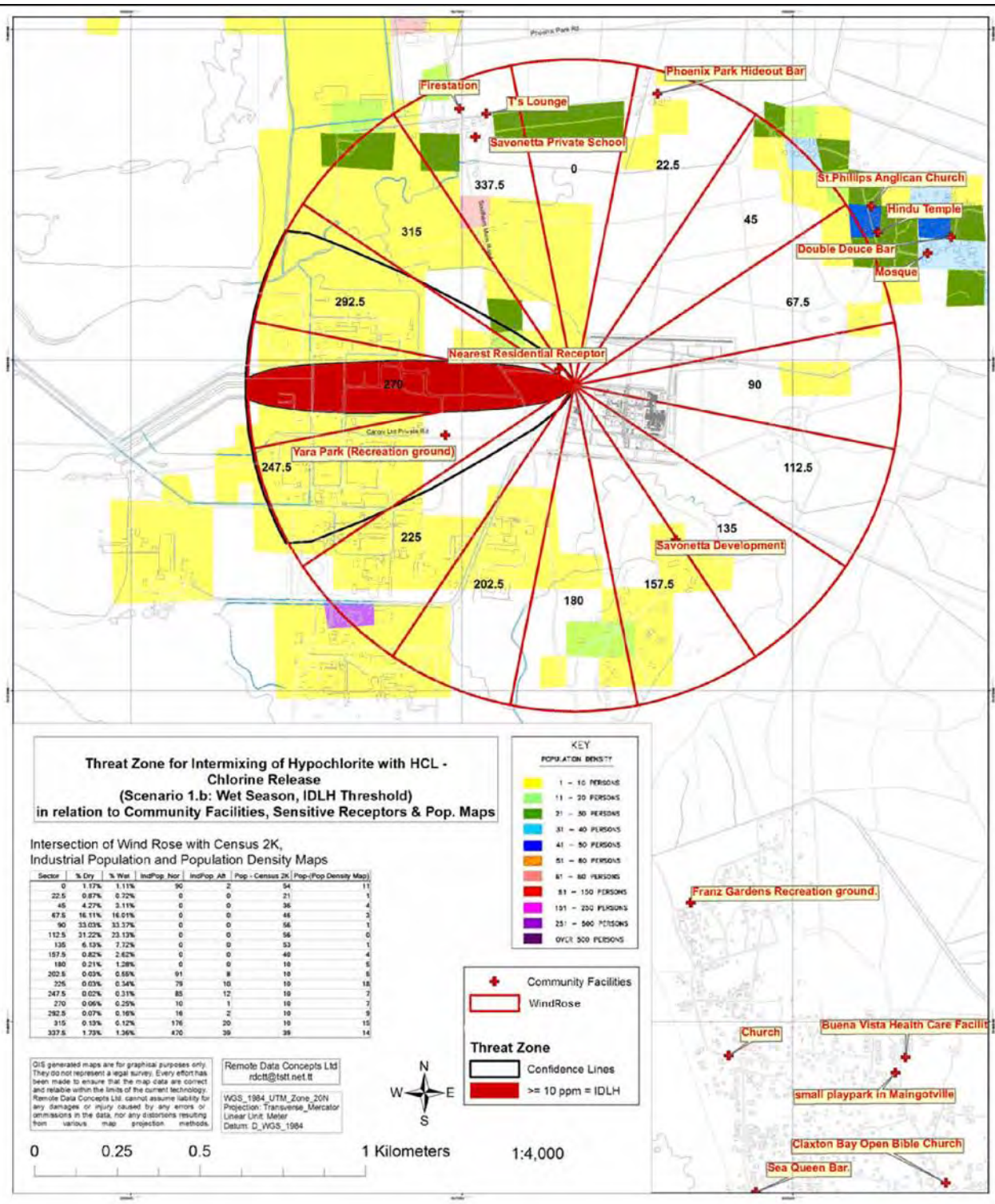
- Red Zone would extend 312 m from the tank truck vent;
- Orange Zone would extend 388 m from the tank truck vent;
- Yellow Zone would extend 597 m from the tank truck vent;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	23.13%	0	0	56	0
135	6.13%	7.72%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.55%	91	8	10	5
225	0.03%	0.34%	79	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	5
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	39	39	14

Figure 5.2-9a. Threat zone for intermixing of hypochlorite with HCl – Chlorine Release,



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	23.13%	0	0	56	0
135	6.13%	7.72%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.65%	91	8	10	8
225	0.03%	0.34%	78	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	9
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	39	39	14

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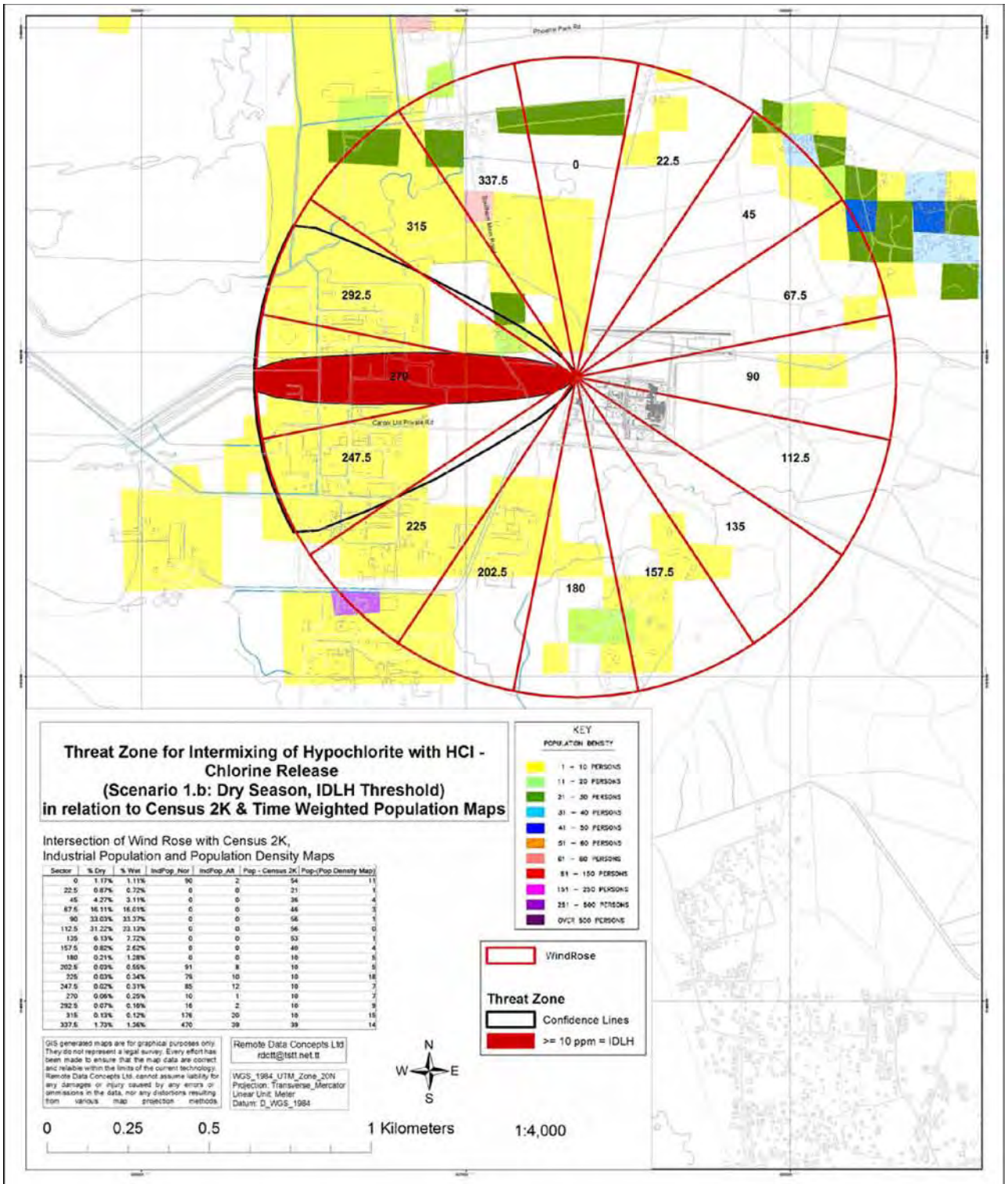
Figure 5.2-9b. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release, (Scenario 1.b: Wet Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	33.13%	0	0	56	0
135	6.13%	7.22%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.55%	91	8	10	5
225	0.03%	0.34%	76	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	9
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	29	39	14

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WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

Figure 5.2-10a. Threat zone for intermixing of hypochlorite with HCl – Chlorine Release, (Scenario 1.b: Dry Season, IDLH Threshold) in relation to time-weighted population.

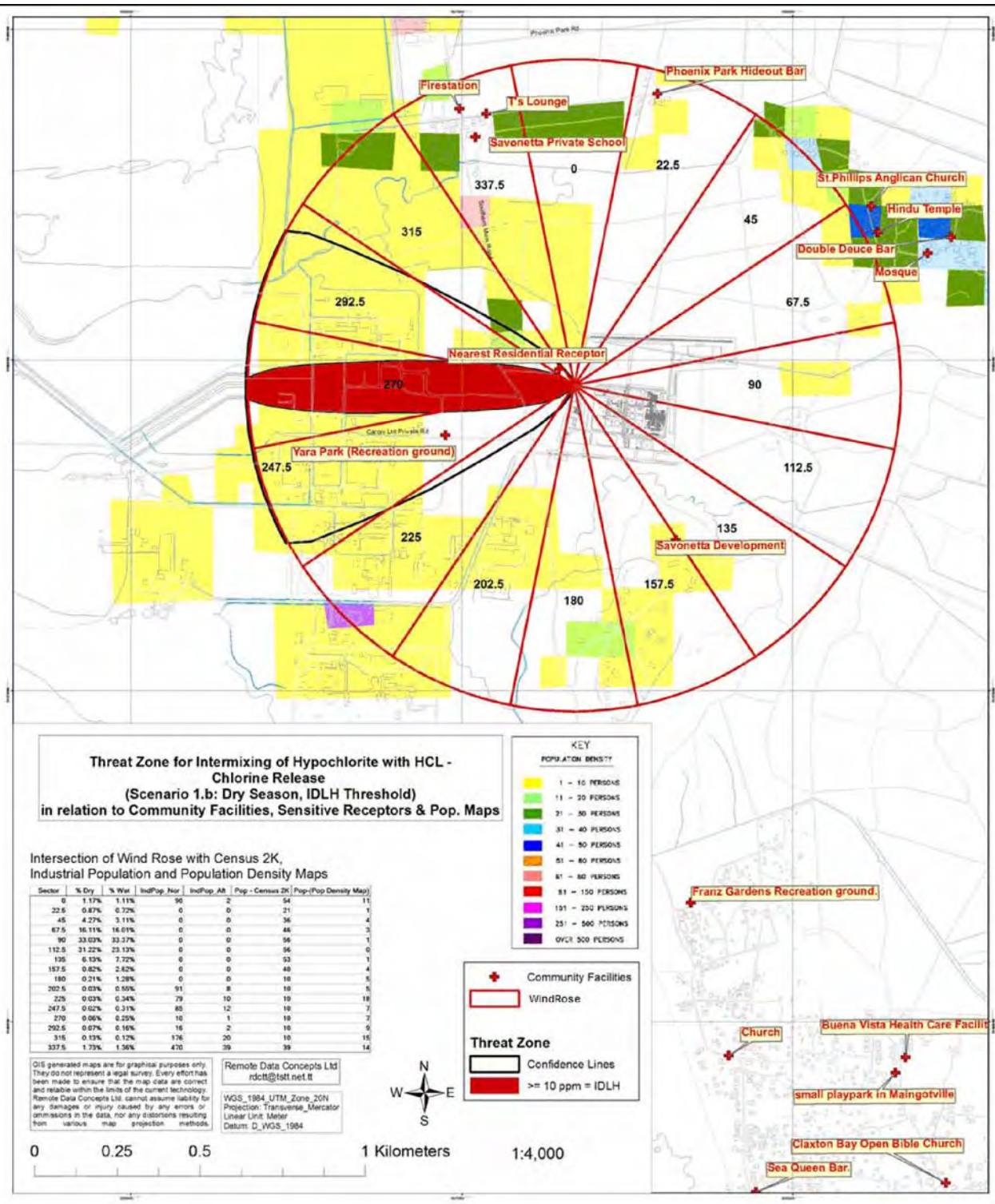
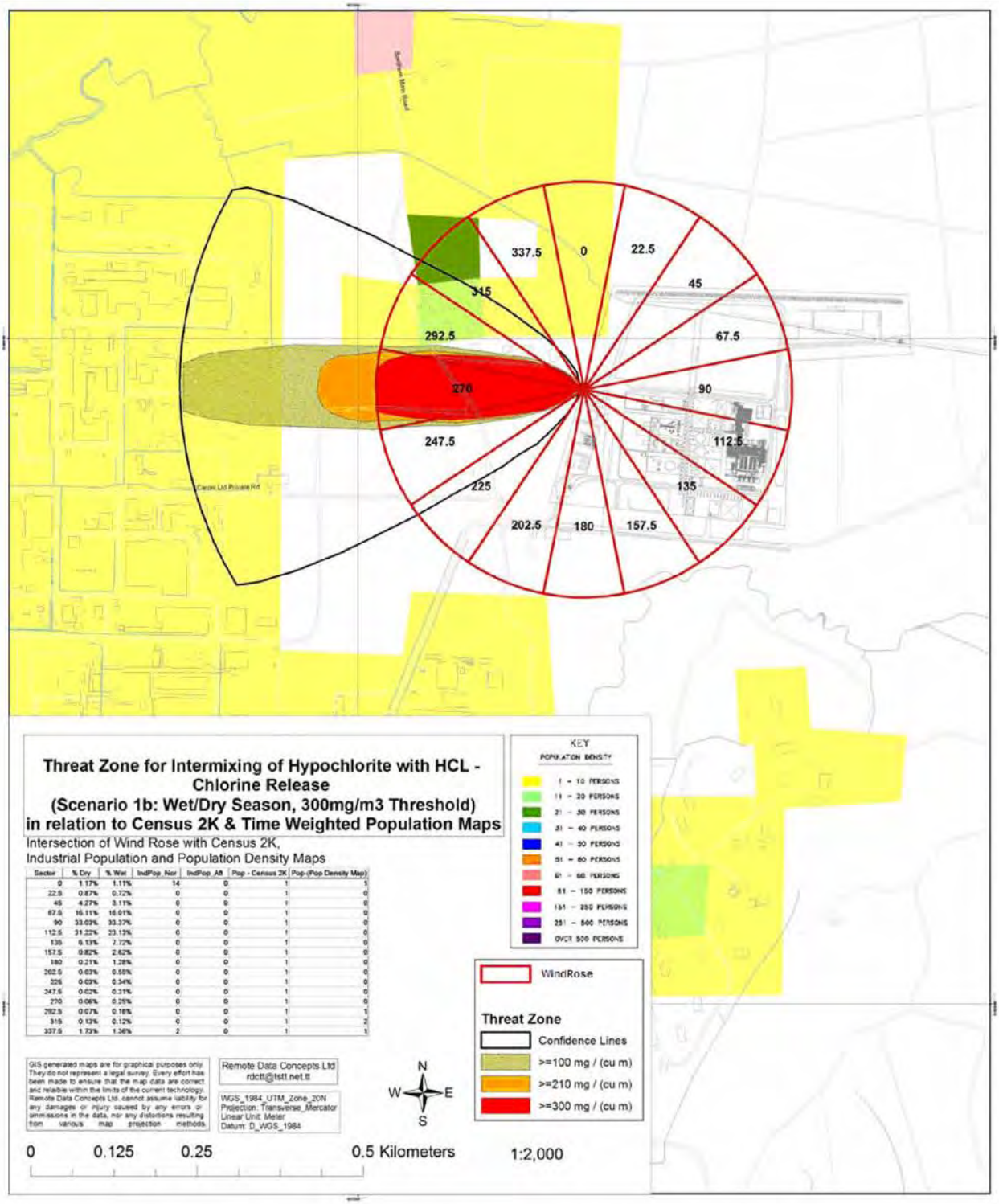


Figure 5.2-10b. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release, (Scenario 1.b: Dry Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	14	0	1	1
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	33.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	1
315	0.13%	0.12%	0	0	1	2
337.5	1.73%	1.36%	2	0	1	1

GIS generated maps are for graphical purposes only. They do not represent a legal survey. Every effort has been made to ensure that the map data are correct and reliable within the limits of the current technology. Remote Data Concepts Ltd. cannot assume liability for any damages or injury caused by any errors or ommissions in the data, nor any distortions resulting from various map projection methods.

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rdctt@tstt.net.tt

WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

Figure 5.2-11a. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release,
(Scenario 1.b: Wet/Dry Season 300 mg/m3 Threshold) in relation to time-weighted

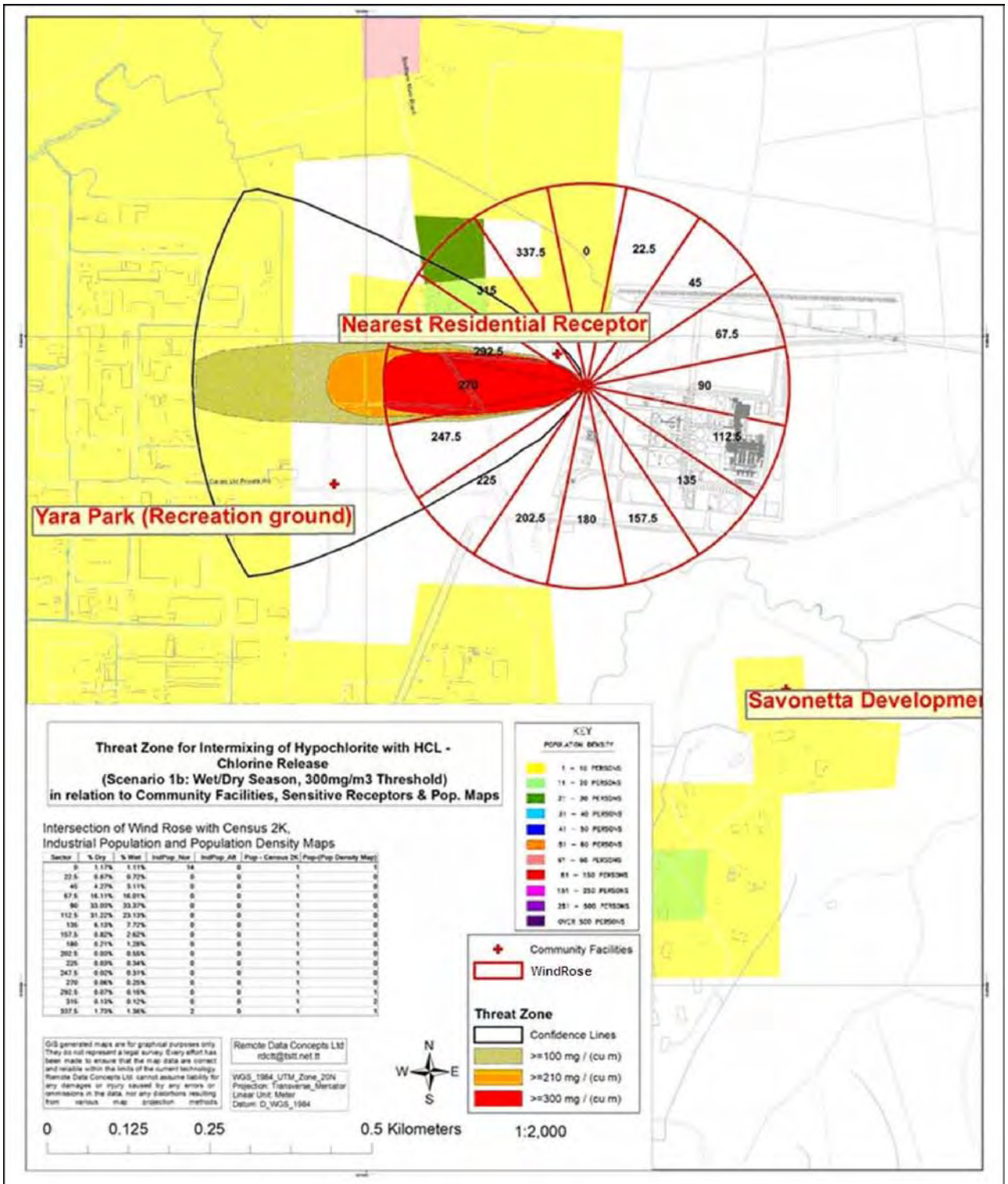


Figure 5.2-11 b. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release,
(Scenario 1.b: Wet/Dry Season, 300 mg/m3 Threshold) in relation to community facilities

5.2.2 Onsite Hazardous Material (Liquid) Release

In each of the scenarios, regardless of the nature of the liquid, the liquid release would be entirely contained by the secondary containment system of the vessel. Emissions would result from the devolution of gas from the secondary containment system. With the wind blowing from the south, a plume of gas would be propagated northwards from the point of release.

According to the April 1999 U.S. EPA Guidance Document on accident release modelling (U.S. Environmental Protection Agency 1999,) only the first 10 minutes of the release for solutions under ambient conditions need to be considered in estimating the consequence distance. This is because the toxic component in a solution evaporates fastest during the first few minutes of a liquid spill, when its concentration is highest. Accidental release modelling conducted for the April 1999 U.S. EPA Guidance document indicates that analysis considering the first 10 minutes of the release gives a good approximation of the overall consequences of the release, and that although the toxic substance will continue to evaporate from the pool after 10 minutes, the rate of evaporation is so much lower that it can safely be ignored in estimating the consequence distance. (U.S. Environmental Protection Agency 1999) Therefore, the duration of release for the liquid spill accidental release scenarios in this Risk Assessment has been set at 10 minutes.

According to the April 1999 U.S. EPA Guidance Document on accidental release modelling, toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 mm Hg (U.S. Environmental Protection Agency) The vapour pressure of 50% sodium hydroxide solution at ambient temperature (20 degrees C) is approximately 1.5 mm Hg and the vapour pressure is approximately 6 mm Hg at a temperature of 40 degrees C (FMC Corporation 2004). Therefore potential air emissions from liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

5.2.2.1 Scenario 2.a. Vessel Failure: Onsite sodium hydroxide storage tank (NaOH spill)

As discussed above, liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

5.2.2.2 Scenario 2.b. Vessel Failure: Onsite hydrochloric acid storage tank (HCl spill)

Modelling assumptions:

The ALOHA computer database does not contain data for hydrochloric acid solutions, but does contain data for hydrogen chloride gas. Therefore, for this and other scenarios modelling liquid hydrochloric acid spills, the following method was used to estimate the gas release rate from a pool of hydrochloric acid solution.

The devolution rate of hydrogen chloride gas from the hydrochloric acid spill was estimated using formulas in the April 1999 U.S. EPA Guidance Document for a liquid release of 37% hydrochloric acid at ambient temperature (U.S. Environmental Protection Agency 1999). The gas release rate is based on the physical properties of 37% hydrochloric acid and the surface area of the onsite (contained) release from the 400,000-gallon (1,514 m^3) onsite hydrochloric storage tank. The surface area of the liquid release is assumed to be the same as the surface are of the secondary containment system for the storage tank. Containment volumes and surface areas for the secondary containment systems for the onsite storage tanks are summarized in Table 4.2-3.

For the offsite (uncontained) transportation spill release, the surface area of the liquid hydrochloric acid release is calculated based on an assumed depth of 1 centimetre for the liquid pool (U.S. Environmental Protection Agency 1999). The hydrochloric acid is assumed to be spilled on a roadway and the spill is assumed to remain on the roadway until remediated by emergency responders.

Other Modelling Assumptions:

The orange threat zone in the output figures corresponds to the 30-minute IDLH level for hydrochloric acid of 50 ppm (75 mg/m^3.)

Wet Season and Dry Season

Figures 5.2-12a and 5.2-12b show that the:

- Red Zone would extend 1.8 km from the secondary containment system;
- Orange Zone would extend 2.5 km from the secondary containment system;
- Yellow Zone would extend 3.5 km from the secondary containment system.
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

5.2.2.3 Scenario 2.c. Vessel Failure: Onsite hypochlorite storage tank (bleach spill)

Modelling assumptions:

The ALOHA computer database does not contain sodium hypochlorite. Therefore, for this and other scenarios modelling sodium hypochlorite, the following method was used to estimate the gas release rate from a pool of sodium hypochlorite solution.

Vapour pressure data for 12.5 percent sodium hypochlorite solutions at various temperatures were obtained from Table 2-2 of the Sodium Hypochlorite Handbook.(The Chlorine Institute 2006). Based on the data the vapour pressure of a 12.5 percent sodium hypochlorite solution at 25 degrees C is estimated to be 20 mm Hg. The vapour over a 12.5 percent sodium hypochlorite solution contains hypochlorous acid and chlorine monoxide (The Chlorine Institute 2006). For the purposes of accidental release modelling the vapour devolved from the liquid sodium hypochlorite release is assumed to be chlorine monoxide.

Liquid spills of bleach into the storage tank secondary containment system or onto pavement could release chlorine monoxide gas to the atmosphere under certain conditions, including the presence of metals that could catalyze a chemical decomposition reaction. Metal catalysts are not likely to be present to interact with or decompose the bleach, and therefore generation of chlorine monoxide during a spill event is very unlikely to occur. The accidental release scenarios for liquid bleach spills are based on chlorine monoxide release in order to provide a conservative assessment.

The devolution rate of chlorine monoxide gas from the sodium hypochlorite spill was estimated based on the vapour pressure of the 12.5 percent sodium hypochlorite solution and the area of the liquid spill using the formula in the April 1999 EPA Guidance Document (U.S. Environmental

Protection Agency 1999). . The surface area of the onsite (contained) release from the onsite bleach storage tanks and receiver tanks is assumed to be the same as the surface area of the secondary containment system for the bleach tanks. Containment volumes and surface areas for the secondary containment systems for the onsite storage tanks are summarized in Table 4.2-3. It is assumed that all of the bleach storage tanks and receiver tanks are contained within the same secondary containment system. For the offsite (uncontained) transportation spill release, the surface area of the liquid bleach release is calculated based on an assumed depth of 1 centimetre for the liquid pool (U.S. Environmental Protection Agency 1999). The bleach is assumed to be spilled on a roadway and the spill is assumed to remain on the roadway until remediated by emergency responders.

Other modelling assumptions:

The orange threat zone in the output figures corresponds to the 30-minute IDLH value of 75 mg/m^3 for hydrochloric acid; the hydrochloric acid IDLH is used as the threshold concentration because there is no established IDLH value for chlorine monoxide.

Both Seasons

The amount of liquid hypochlorite released is 187,000 gal (708 m^3). The secondary containment is filled, and chlorine dioxide gas devolves from the secondary containment system. The duration of the release is assumed to be 10 minutes based on the April 1999 U.S. EPA Guidance Document. It is assumed that the devolution of gas from the liquid spill occurs over the first ten minutes after the release occurs, and that the devolution rate of gas decreases after the first ten-minute period.

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Modelling results:

Wet Season and Dry Season

Figures 5.2-13a and 5.2-13b show that the:

- Red Zone would extend 490 m from the secondary containment system;
- Orange Zone would extend 720 m from the secondary containment system;
- Yellow Zone would extend 1.1 km from the secondary containment system;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

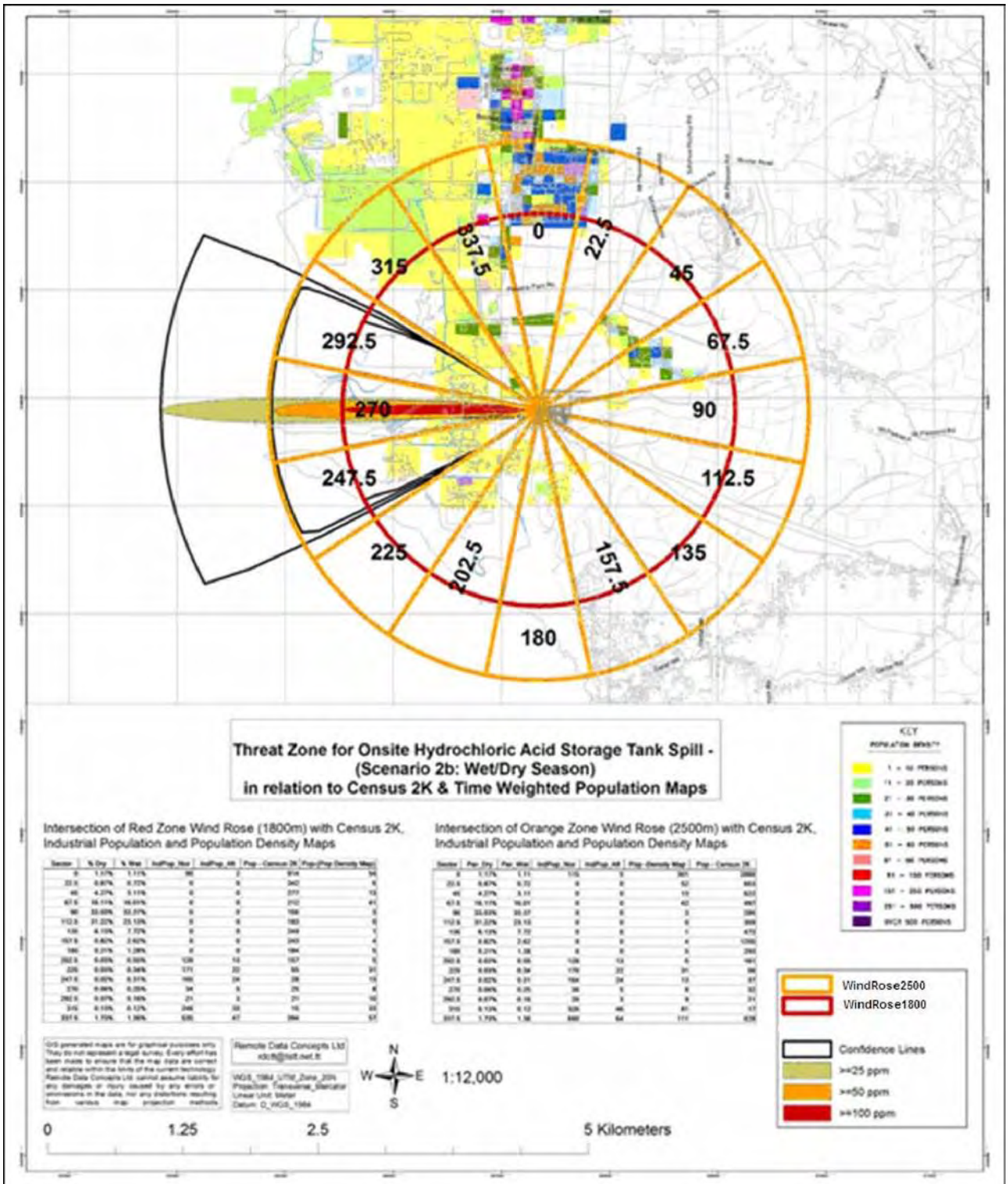


Figure 5.2-12a. Threat zone for onsite hydrochloric acid storage tank spill

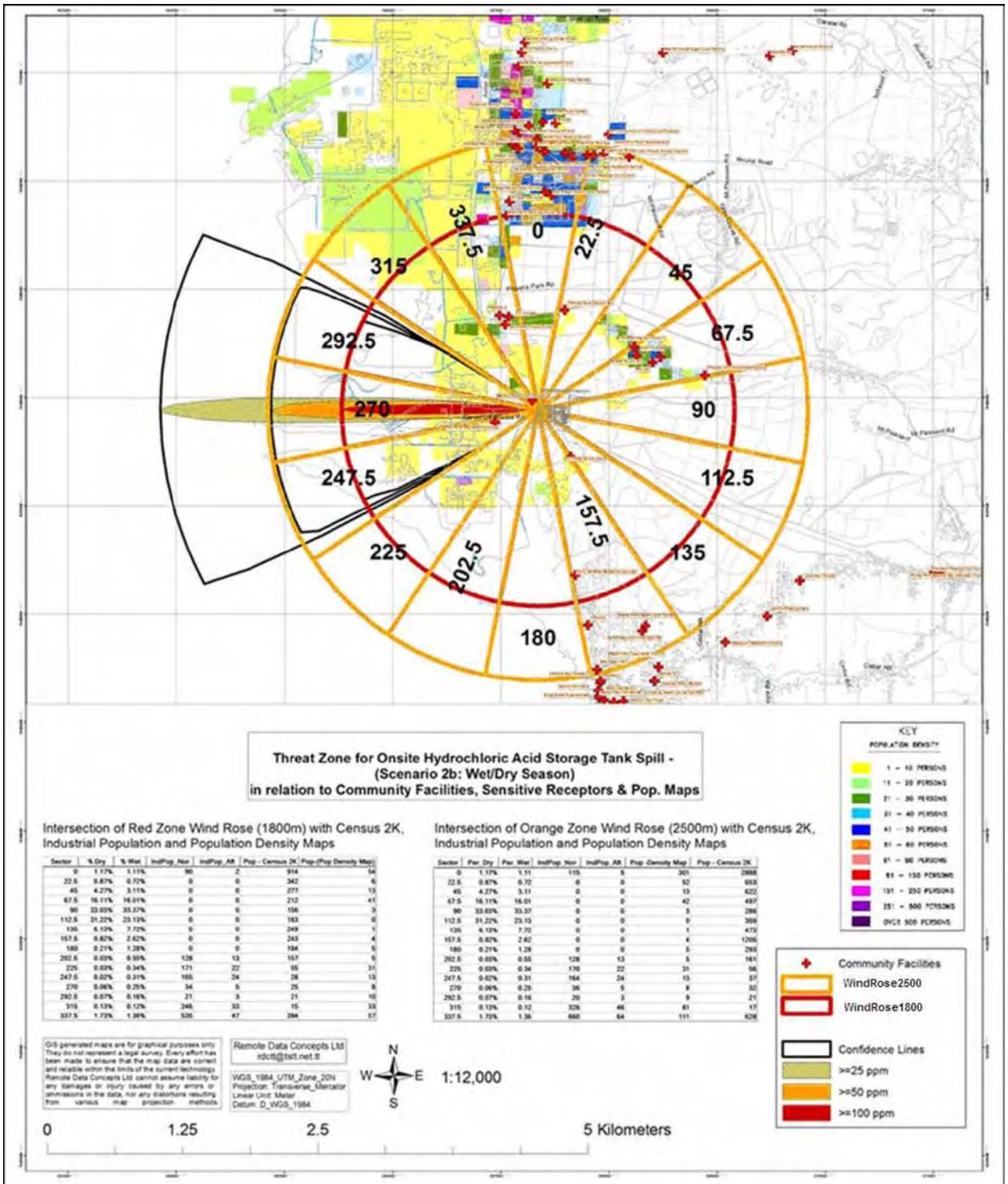


Figure 5.2-12b. Threat zone for onsite hydrochloric acid storage tank spill (Scenario 2.b: Wet/Dry Season) in relation to community facilities and sensitive receptors.

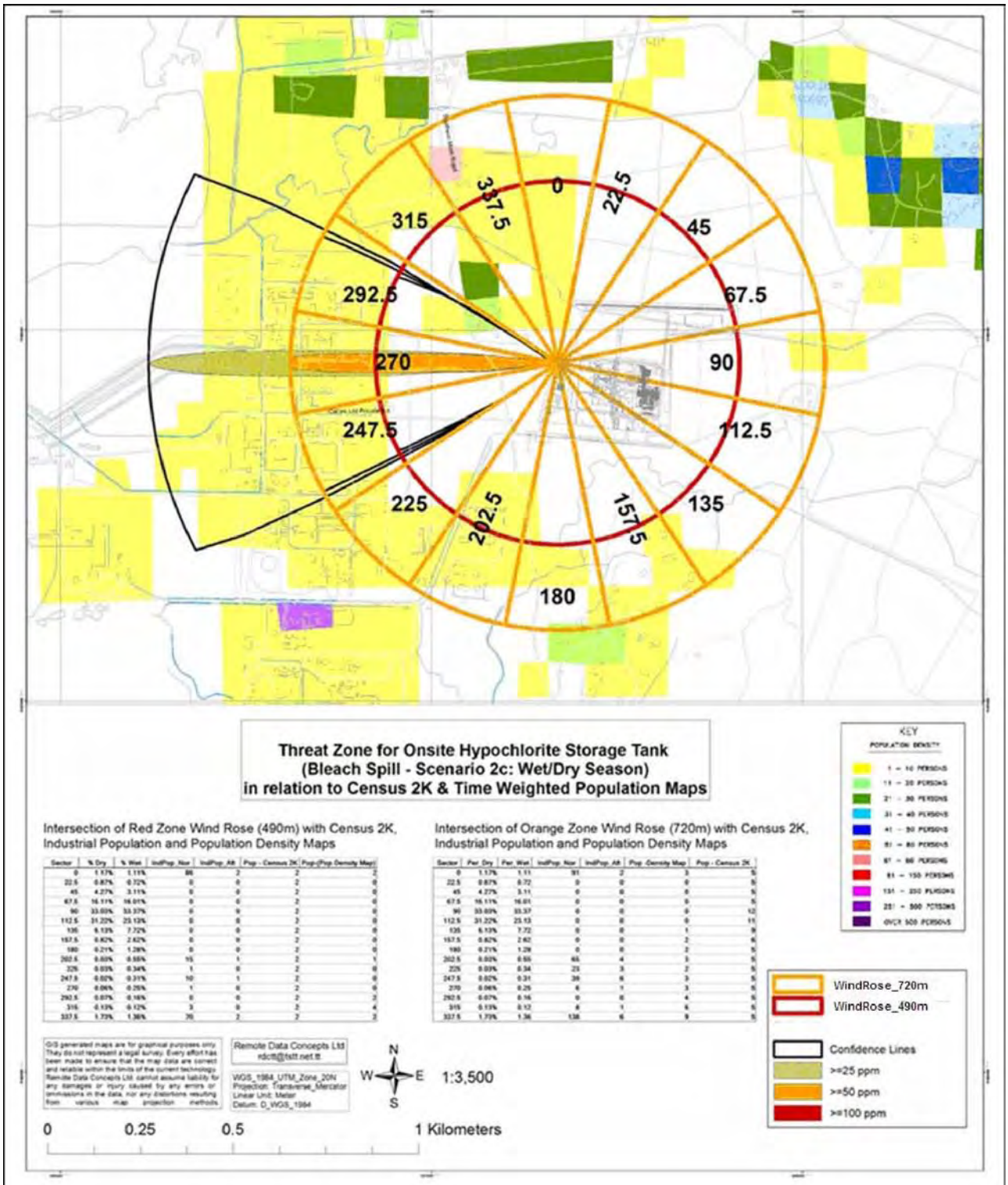


Figure 5.2-13a. Threat zone for onsite hypochlorite storage tank (bleach spill)

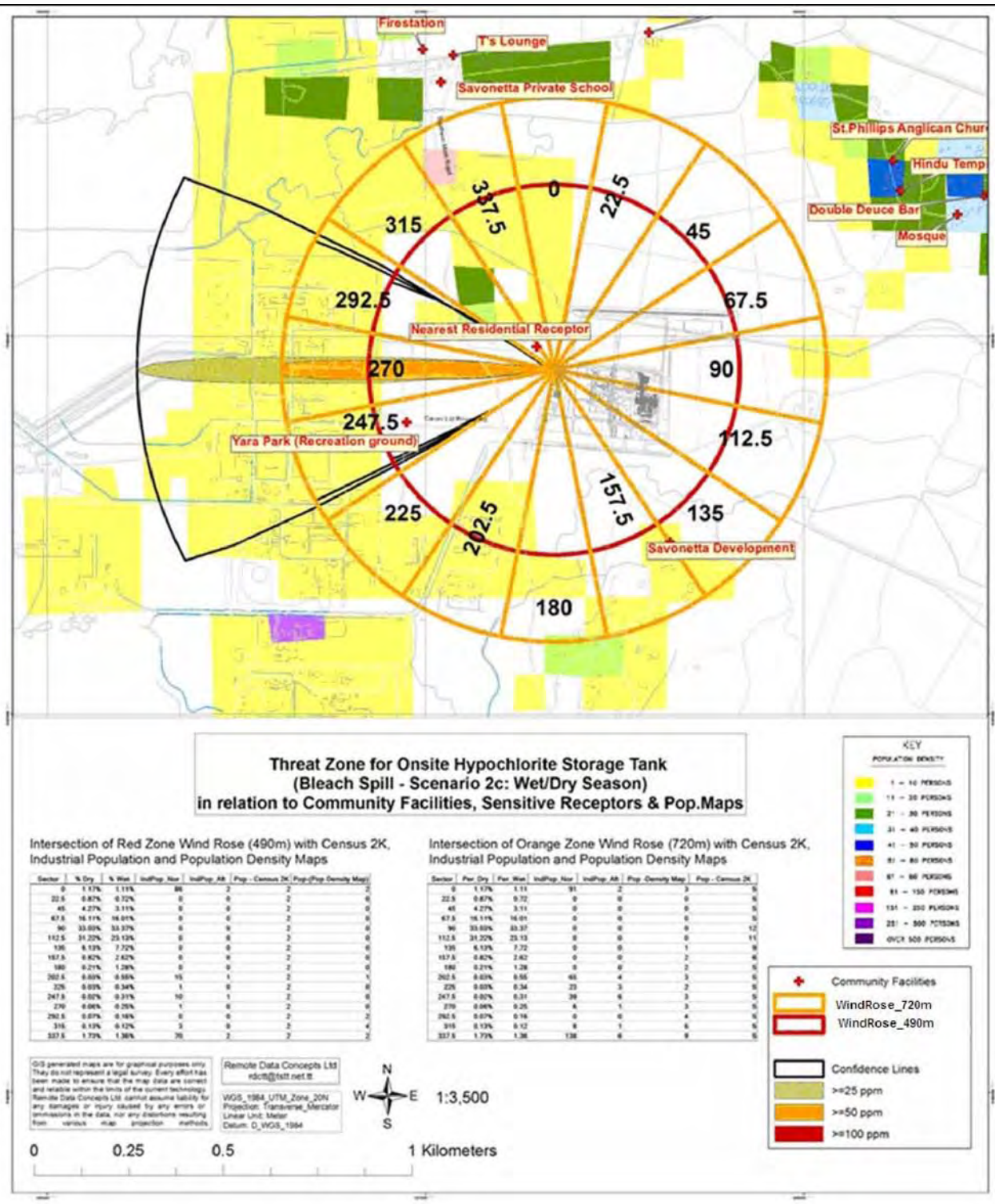


Figure 5.2-13b. Threat zone for onsite hypochlorite storage tank (bleach spill) (Scenario 2.c: Wet/Dry Season) in relation to community facilities and sensitive

5.2.3 Flammable Gas Release (Dispersion) Scenario

As with the onsite hazardous materials (gaseous) releases, the model used was ALOHA. The threats modelled were, firstly, flammable area of vapour cloud and, secondly, overpressure (blast force) from vapour cloud explosion, the latter ignited either by detonation or by a spark or flame.

5.2.3.1 Scenario 3.a. Hydrogen (indoor and outdoor) process pipe breach (H_2 release)

Plant emergency shut down would occur in approximately three minutes from initiation, limiting the un-combusted hydrogen gas release duration to approximately three minutes. The volume of hydrogen contained in the breached process equipment is equivalent to a release rate of approximately three pounds of hydrogen for three minutes, for a total release of 9 pounds (4 kg) of hydrogen.

Levels of concern for the flammable area of vapour cloud were 60% Lower Explosion Limit (24,000 ppm) and 10% Lower Explosion Limit (4,000 ppm).

The level of concern for overpressure (blast force) from vapour cloud explosion was the Lower Explosion Limit (40,000 ppm).

Scenario 3. a.1 Indoor Release Scenario

Modelling assumptions:

Both Seasons

The 9 pounds (4 kg) of hydrogen are released within the cell room over a 3-minute period at a pressure of 4.18 psig and are entrained in the cell room ventilation (ambient air] system and exhausted to the atmosphere. The estimated exhaust gas flow rate is approximately 100,000 Nm^3/hour.

Wet Season

Building air exchanges per hour number 0.40 (for an unsheltered single-storied building)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 0.40 (for an unsheltered single-storied building)

Weather conditions as described in Section 5.1.

Modelling results:

ALOHA did not draw threat zones as ground level concentrations of hydrogen did not reach levels of concern (i.e., explosive limits) of any of the threats modelled.

Scenario 3.a.2 Outdoor Release Scenario

Modelling assumptions:

Both Seasons

The 9 pounds (4 kg) of hydrogen are released to the atmosphere over a period at a pressure of 4.18 psig and from a release height of 4 m above ground level.

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Modelling results:

ALOHA did not draw threat zones as ground level concentrations of hydrogen did not reach levels of concern (i.e., explosive limits) of any of the threats modelled.

Scenario 3.a.3 Outdoor Release Scenario (seismic event)

Both Seasons

The 9 pounds (4 kg) of hydrogen are released to the atmosphere over a 3-minute period at a pressure of 4.18 psig and from a release height of 4 m above ground level.

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Modelling results:

ALOHA did not draw threat zones as ground level concentrations of hydrogen did not reach levels of concern (i.e., explosive limits) of either of the threats modelled.

5.2.3.2 Scenario 3.b. Hydrogen vent stack release and HCl scrubber stack release

Levels of concern for the flammable area of vapour cloud were:

- Red Zone: Lower Explosion Limit (40,000 ppm);
- Orange Zone: 60% Lower Explosion Limit (24,000 ppm);
- Yellow Zone: 10% Lower Explosion Limit (4,000 ppm).

Levels of concern for overpressure (blast force) from vapour cloud explosion were:

- Red Zone: 8.0 psi overpressure (high enough to cause destruction of buildings);
- Orange Zone: 3.5 psi overpressure (serious injury likely);
- Yellow Zone: 1.0 psi overpressure (high enough to shatter glass).

Modelling assumptions:

Both seasons:

Fifteen m^3 of hydrogen would be vented from the hydrogen vent stack at a height of 10 m above ground level over a period of 30 minutes. An additional 15 m^3 of hydrogen would be vented from the HCl scrubber stack over the same 30-minute period at a height of 29 m above ground level.

The model runs for this scenario consider the two releases occur simultaneously, but the two releases are modelled as separate simultaneous events (i.e., the plumes are assumed not to interact with one another) because the release from the hydrogen vent stack occurs at 10 m above ground level and the release from the HCl scrubber occurs at 29 m above ground level.

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Modelling results – Hydrogen vent stack release (Scenario 3.b.1)

Wet Season

ALOHA did not draw threat zones for flammable area of vapour cloud because ground-level concentrations of hydrogen never exceeded the levels of concern (i.e., explosive limits) for this hazard.

However, ground-level concentrations of hydrogen did exceed levels of concern of overpressure (blast force) from a vapour cloud explosion in which ignition was by either detonation or by spark or flame.

ALOHA results showed that the:

- Red zone extends less than 10 m from the hydrogen vent stack;
- Orange zone extends less than 10 m from the hydrogen vent stack;
    - Yellow zone extends 12 m from the hydrogen vent

stack. *Dry Season*

ALOHA did not draw threat zones for the flammable area of the vapour cloud because ground-level concentrations of hydrogen never exceeded the levels of concern (i.e., explosive limits) for this hazard.

However, ground-level concentrations of hydrogen did exceed levels of concern of overpressure (blast force) from vapour cloud explosion in which ignition was by either detonation or by spark or flame.

ALOHA results showed that the:

- Red zone extends less than 10 m from the hydrogen vent stack;
- Orange zone extends less than 10 m from the hydrogen vent stack;
- Yellow zone extends 12 m from the hydrogen vent stack.

Modelling results – HCl scrubber stack release (Scenario 3.b.2):

Wet Season

ALOHA did not draw threat zones for flammable area of vapour cloud because ground-level concentrations of hydrogen never exceeded the levels of concern (i.e., explosive limits) for this hazard.

However, ground-level concentrations of hydrogen did exceed levels of concern of overpressure (blast force) from vapour cloud explosion in which ignition was by either detonation or by spark or flame.

ALOHA results showed that the:

- Red zone extends less than 10 m from the HCl scrubber stack;
- Orange zone extends less than 10 m from the HCl scrubber stack;
    - Yellow zone extends 13 m from the HCl scrubber

stack. *Dry Season*

ALOHA did not draw threat zones for flammable area of vapour cloud because ground-level concentrations of hydrogen never exceeded the levels of concern (i.e., explosive limits) for this hazard.

However, ground-level concentrations of hydrogen did exceed levels of concern of overpressure (blast force) from vapour cloud explosion in which ignition was by either detonation or by spark or flame.

ALOHA results showed that the:

- Red zone extends less than 10 m from the HCl scrubber stack;
- Orange zone extends less than 10 m from the HCl scrubber stack;
- Yellow zone extends 13 m from the HCl scrubber stack.

5.2.4 Flammable Gas Release (Deflagration) Scenario

The model used was ALOHA. The threat modelled was overpressure (blast force) from vapour cloud explosion, ignited by detonation.

Levels of concern for overpressure (blast force) from vapour cloud explosion were:

- Red Zone: 8.0 psi overpressure (high enough to cause destruction of buildings);
- Orange Zone: 3.5 psi overpressure (serious injury likely);
- Yellow Zone: 1.0 psi overpressure (high enough to shatter glass).

5.2.4.1 Scenario 4.a. Onsite Natural gas deflagration (CH_4 release)

Modelling assumptions:

Both seasons:

The eight ft^3 (0.023 m^3) of natural gas are released at a pressure of 1 psig (1.1 bar) over the course of one minute and ignite immediately upon release.

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Modelling results:

Both seasons:

ALOHA did not draw threat zones because no part of the cloud of released natural gas is above the Lower Explosion Limit at any time.

5.2.4.2 Scenario 4.b. Offsite Natural gas deflagration (CH_4 release)

Modelling assumptions:

Both seasons:

The 0.65 m^3 of natural gas are released at a pressure of 340 to 360 psig (24.5 to 26 bar) over the course of one minute and ignite immediately upon release.

Modelling results:

Wet Season and Dry Season

Figures 5.2-14a and 5.2-14b show that the:

- Red zone extends 299 m from the offsite natural gas tie-in;
- Orange zone extends 311 m from the offsite natural gas tie-in;
- Yellow zone extends 387 m from the offsite natural gas tie-in.

5.2.5 Offsite Fixed Facility Hazardous Material Release

According to April 1999 U.S. EPA Guidance Document on accidental release modelling, toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 mm Hg (U.S. Environmental Protection Agency 1999). The vapour pressure of 50-percent sodium hydroxide solution at ambient temperature (20 degrees C) is approximately 1.5 mm Hg and the vapour pressure is approximately 6 mm Hg at a temperature of 40 degrees C (Dow Chemical Company 2007, FMC Corporation 2004). Therefore, potential air emissions from liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

5.2.5.1 Scenario 5.a. Vessel Failure: Offsite EISL facility caustic tank breach (NaOH spill)

As discussed above, liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

5.2.5.2 Scenario 5.b. Offsite caustic pipeline breach (NaOH spill)

As discussed above, liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

5.2.6 Offsite Transportation Hazardous Material Release

For the hydrochloric acid truck transportation scenario and the hypochlorite (bleach) truck transportation scenario, it is assumed that the 4,000-gallon (15,140-litre) liquid release would occur over a paved area and that chlorine monoxide gas devolves from the surface of the liquid spill. As discussed above, based on the April 1999 U.S. EPA Guidance Document on accidental release modelling the duration of the gas release is assumed to be ten minutes.

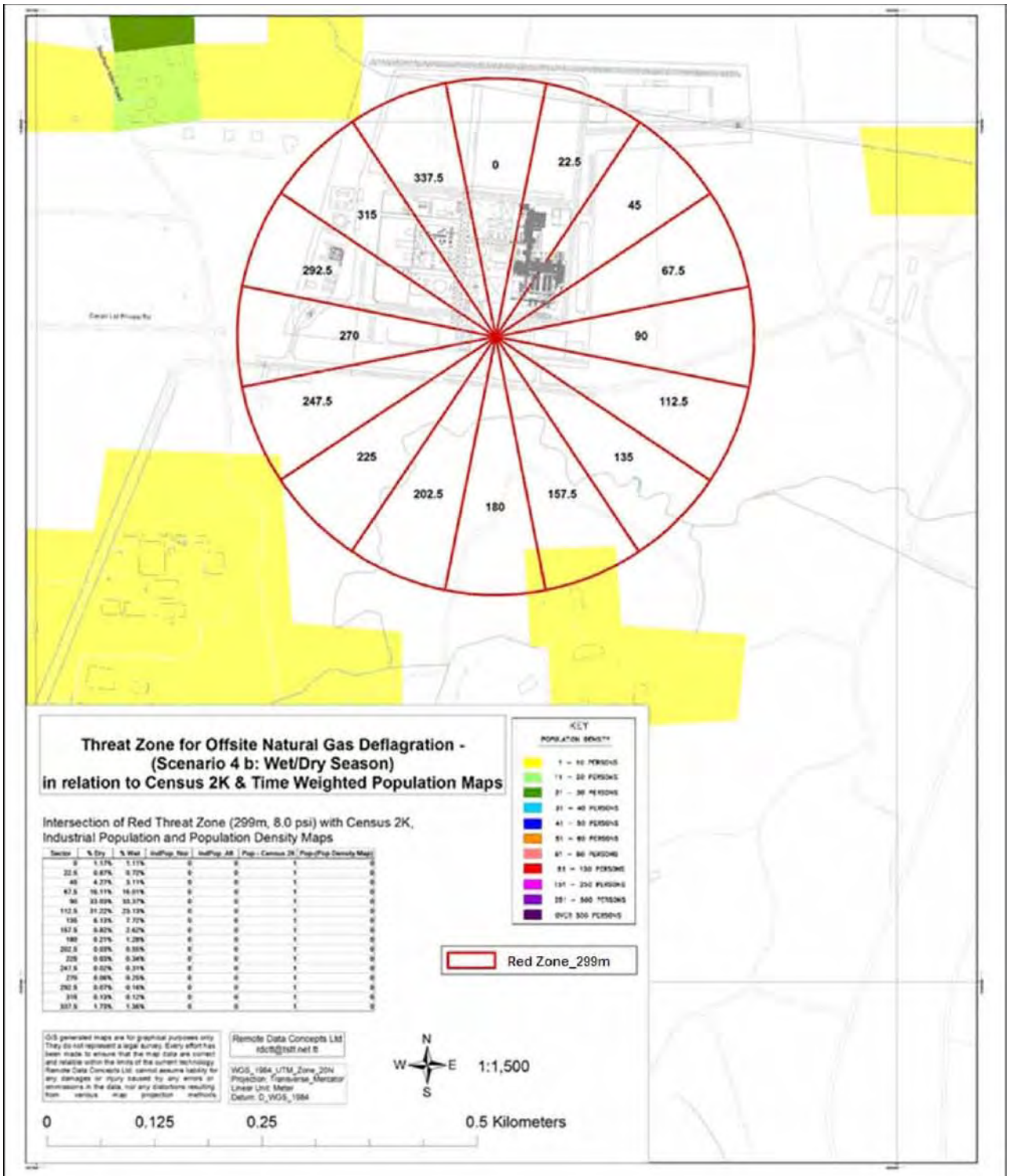


Figure 5.2-14a. Threat zone for offsite natural gas deflagration (Scenario 4.b: Wet/Dry Season) in relation to time-weighted population.

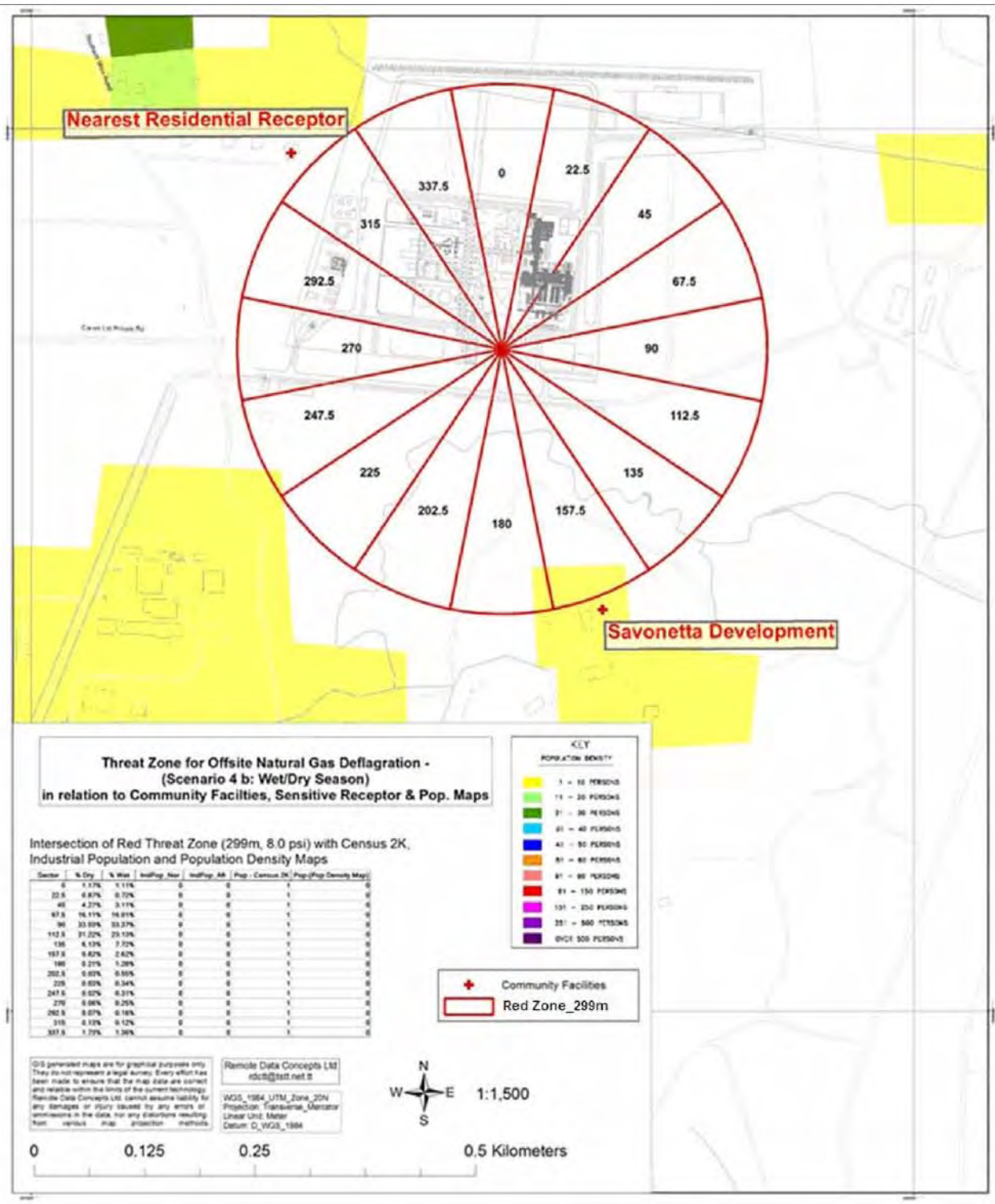


Figure 5.2-14b. Threat zone for offsite natural gas deflagration (Scenario 4.b: Wet/Dry Season) in relation to community facilities and sensitive receptors.

5.2.6.1 Scenario 6.a. Hydrochloric acid: 4,000-gallon tank truck accident on public road (HCl spill)

Modelling assumptions:

The red zone is the zone of the plume of hydrogen chloride gas within which the concentration of hydrogen chloride would reach or exceed 100 ppm. Similarly, the concentration of chlorine gas within the orange zone would reach or exceed 50 ppm (75 mg/m^3), and the concentration of chlorine gas within the yellow zone would reach or exceed 25 ppm. The IDLH for hydrogen chloride is 75 mg/m^3.

Modelling results:
Wet Season:

Figures 5.2-15a and 5.2-15b show that the:

- Red Zone would extend 2.3 kilometres from the point of release;
- Orange Zone would extend 3.3 kilometres from the point of release;
- Yellow Zone would extend 4.6 kilometres from the point of release;
    - The confidence lines describe an angle of approximately 60

degrees. *Dry Season:*

Figures 5.2-16a and 5.2-16b shows that the:

- Red Zone would extend 2.3 kilometres from the point of release;
- Orange Zone would extend 3.2 kilometres from the point of release;
- Yellow Zone would extend 4.5 kilometres from the point of release;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

5.2.6.2 Scenario 6.b. Hypochlorite: 4,000-gallon (15,140-litre) tank truck accident on public road (bleach spill)

Modelling assumptions:

Both seasons:

The height of release is one foot above ground level. The duration of release is 10 minutes based on the April 1999 U.S. EPA Guidance Document on accidental release modelling. It is assumed that the devolution of gas from the liquid spill occurs over the first ten minutes after the release occurs, and that the devolution rate of gas decreases after the first ten-minute period.

Using the method outlined in Section 5.2.2.3, the 4,000 gal (15,140 L) of sodium hypochlorite would result in devolution of the equivalent of 48 kilograms per minute of chlorine monoxide gas. The chlorine monoxide release is modelled as a dense gas release using ALOHA.

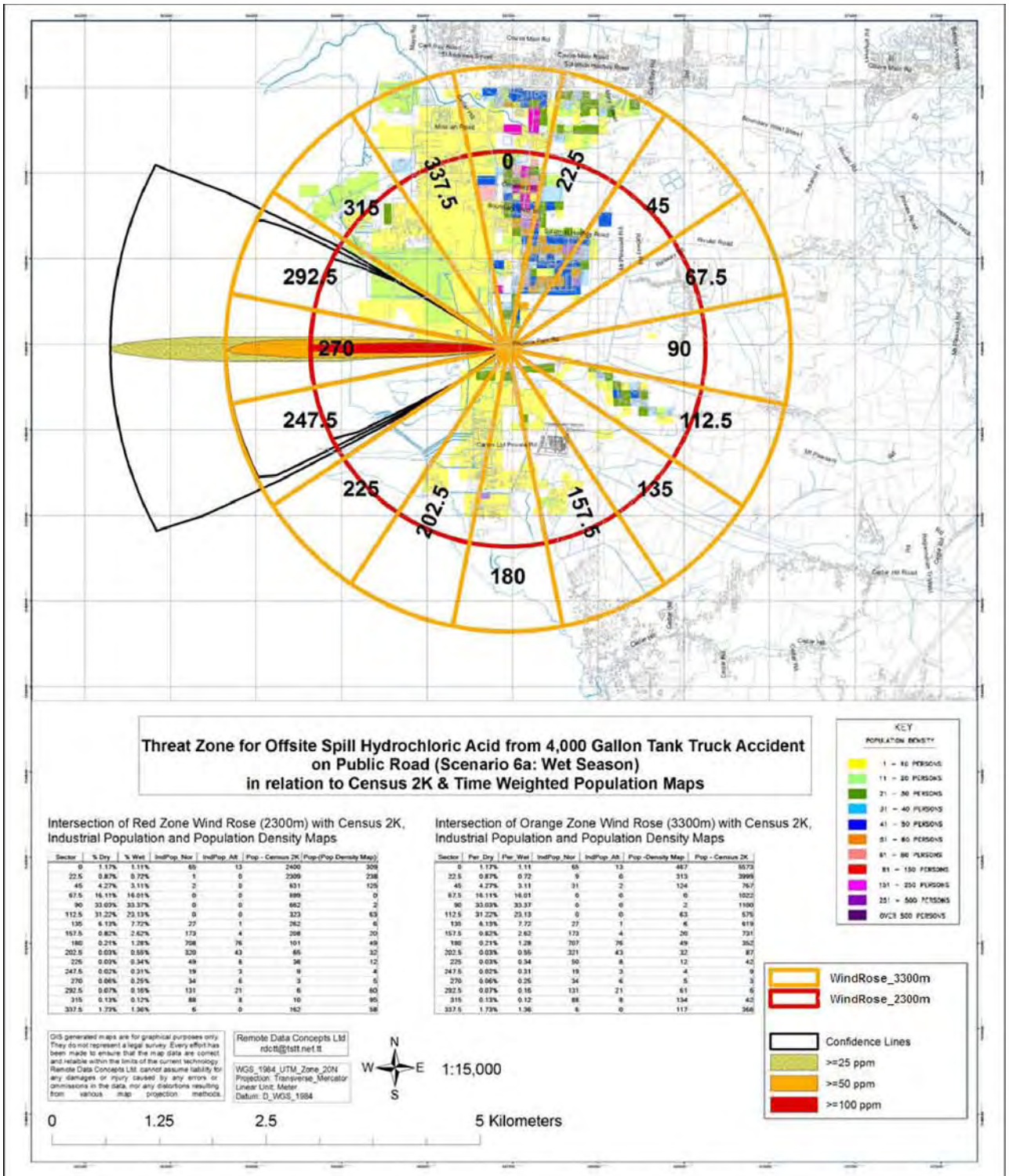
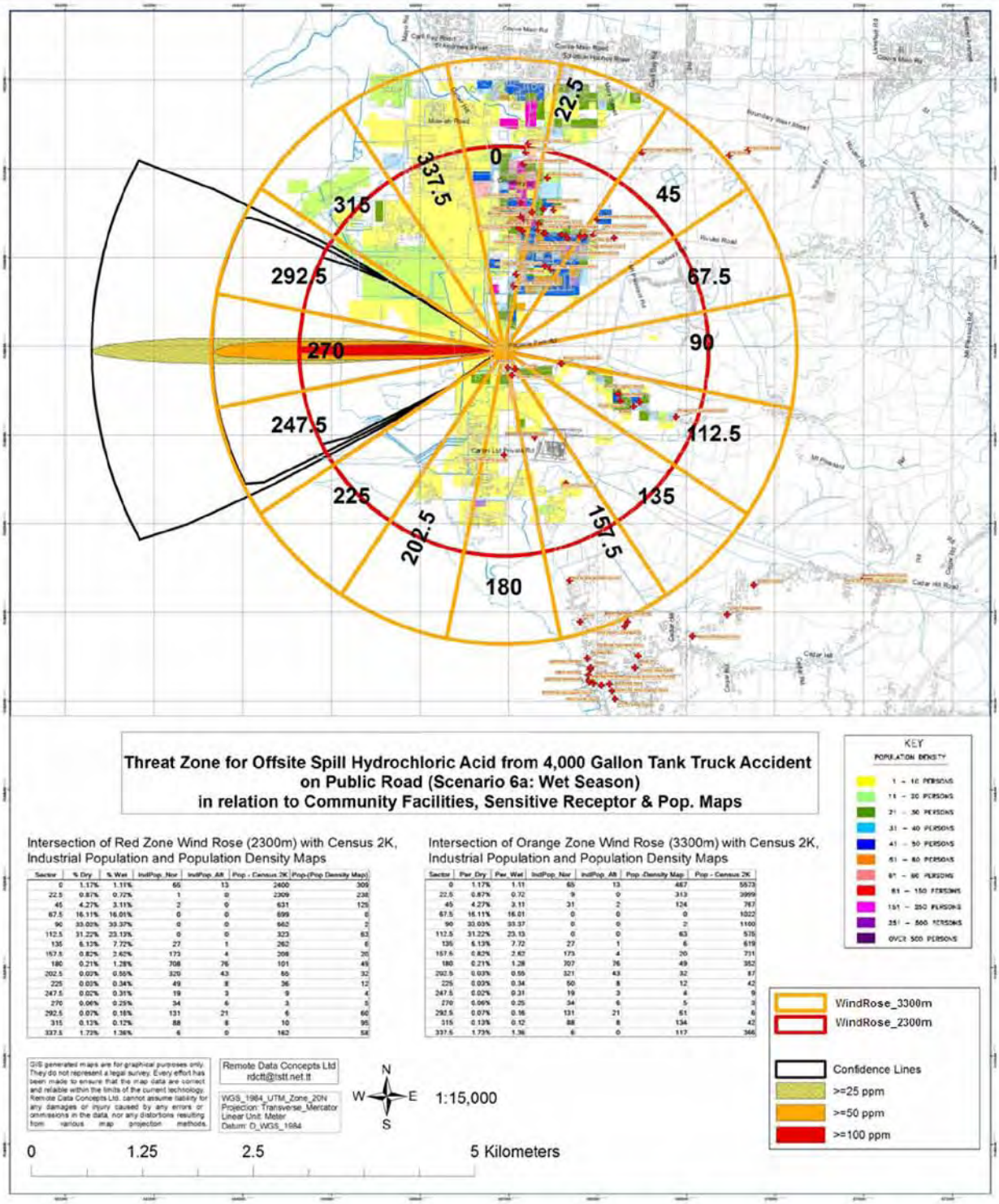


Figure 5.2-15a. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Wet Season) in relation to time-weighted population.



Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	126
67.5	16.11%	16.01%	0	0	699	6
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	55	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3300m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Alt	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1160
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	711
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	51	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

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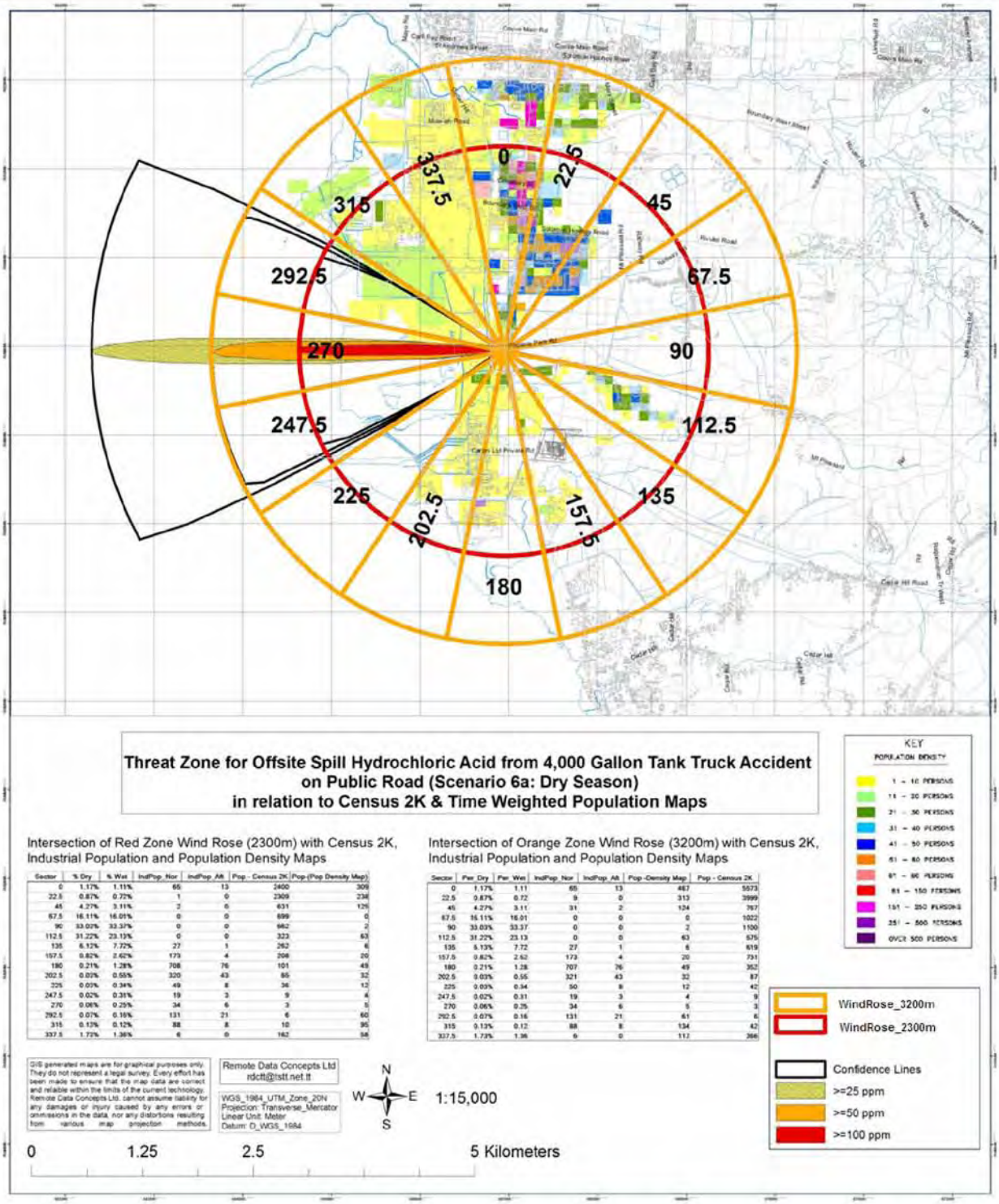
Figure 5.2-15b. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Wet Season) in relation to community facilities and sensitive receptors.



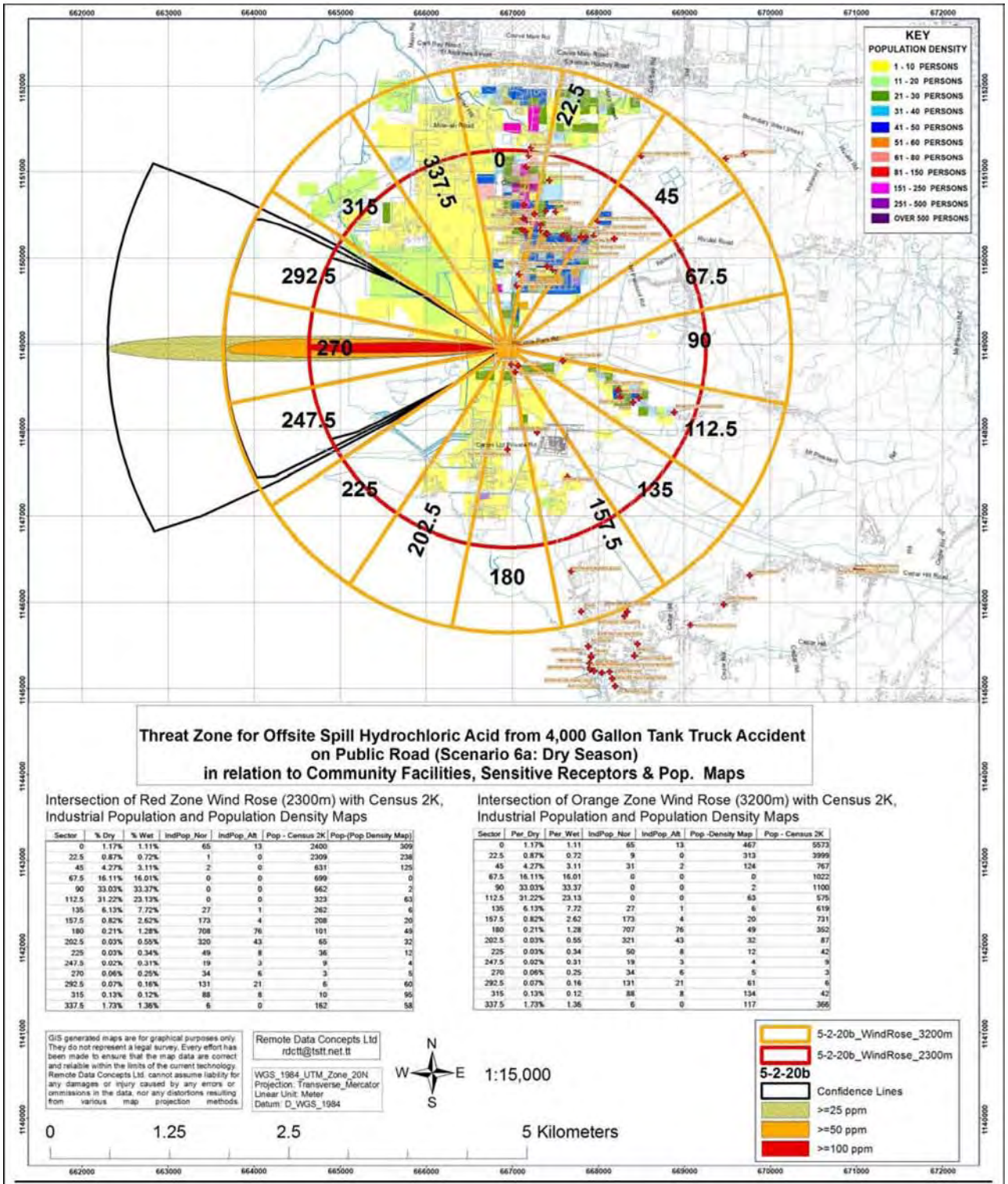
Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	899	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	95	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	38

Intersection of Orange Zone Wind Rose (3200m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Alt	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	757
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	112	266

Figure 5.2-16a. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Dry Season) in relation to time-weighted population.



Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	699	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	65	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3200m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Alt	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

Figure 5.2-16b. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Dry Season) in relation to community facilities and sensitive receptors.

The orange threat zone in the output figures corresponds to the 30-minute IDLH level for hydrochloric acid of 50 ppm (75 mg/m^3.) The hydrochloric acid IDLH is used as the threshold because there is no established IDLH for chlorine monoxide.

Wet Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Dry Season

Building air exchanges per hour number 60 (specified by user)

Weather conditions as described in Section 5.1.

Modelling results:

Wet and Dry Season:

Figures 5.2-17a and 5.2-17b shows that the:

- Red Zone would extend 1.0 kilometres from the point of release;
- Orange Zone would extend 1.5 kilometres from the point of release;
- Yellow Zone would extend 2.2 kilometres from the point of release;
- The confidence lines describe an angle of approximately 60 degrees.

A description of the assumptions used in these modelling runs and full results of the modelling runs are provided in Attachment 1.

5.2.7 Onsite Equipment Fire and Explosion Scenarios

Onsite equipment fire and explosion scenarios evaluated in this Risk Assessment are identified in Table 4.1.2. Potential onsite consequences to employees, contractors, and visitors, and control and mitigation measures for these scenarios are described in this section. These scenarios are not anticipated to result in offsite consequences to the public. Scenarios having the potential for offsite consequences to the public and for which quantitative modelling has been conducted are discussed in Sections 5.2.1 through 5.2.6 above.

5.2.7.1 Scenario 7.a. Natural Gas Leak, Steam Boiler System

A natural gas leak from the steam boiler system resulting in ignition and fire was estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event, as well as property damage. Natural gas leaks would generally be detected directly by employees' sense of smell, through inspection of the natural gas piping, or through continuous monitoring of the natural gas system pressure. The frequency of such events would be minimized by routine preventive maintenance of natural gas piping and associated equipment. The consequences of such events would be minimized by excess flow

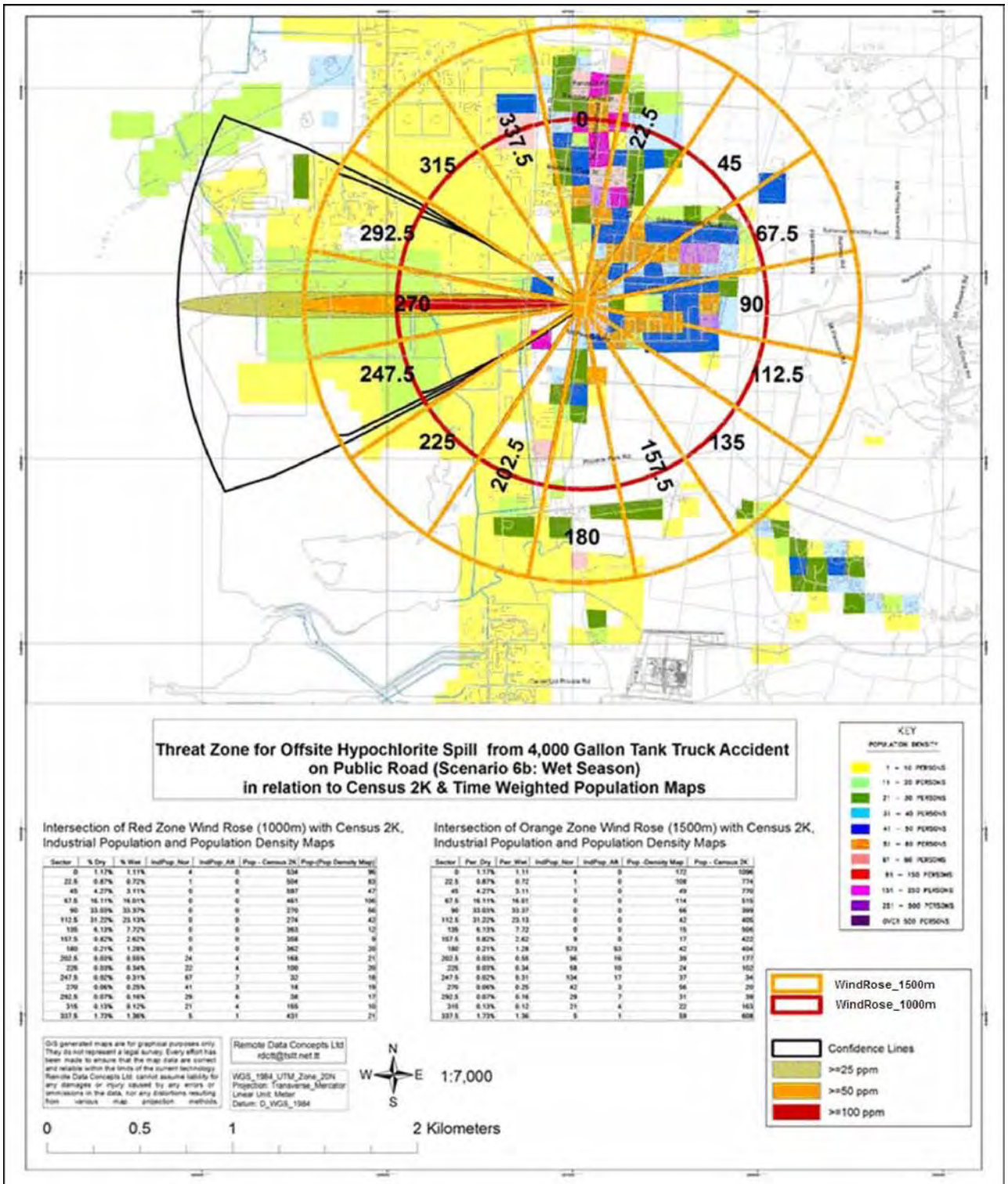
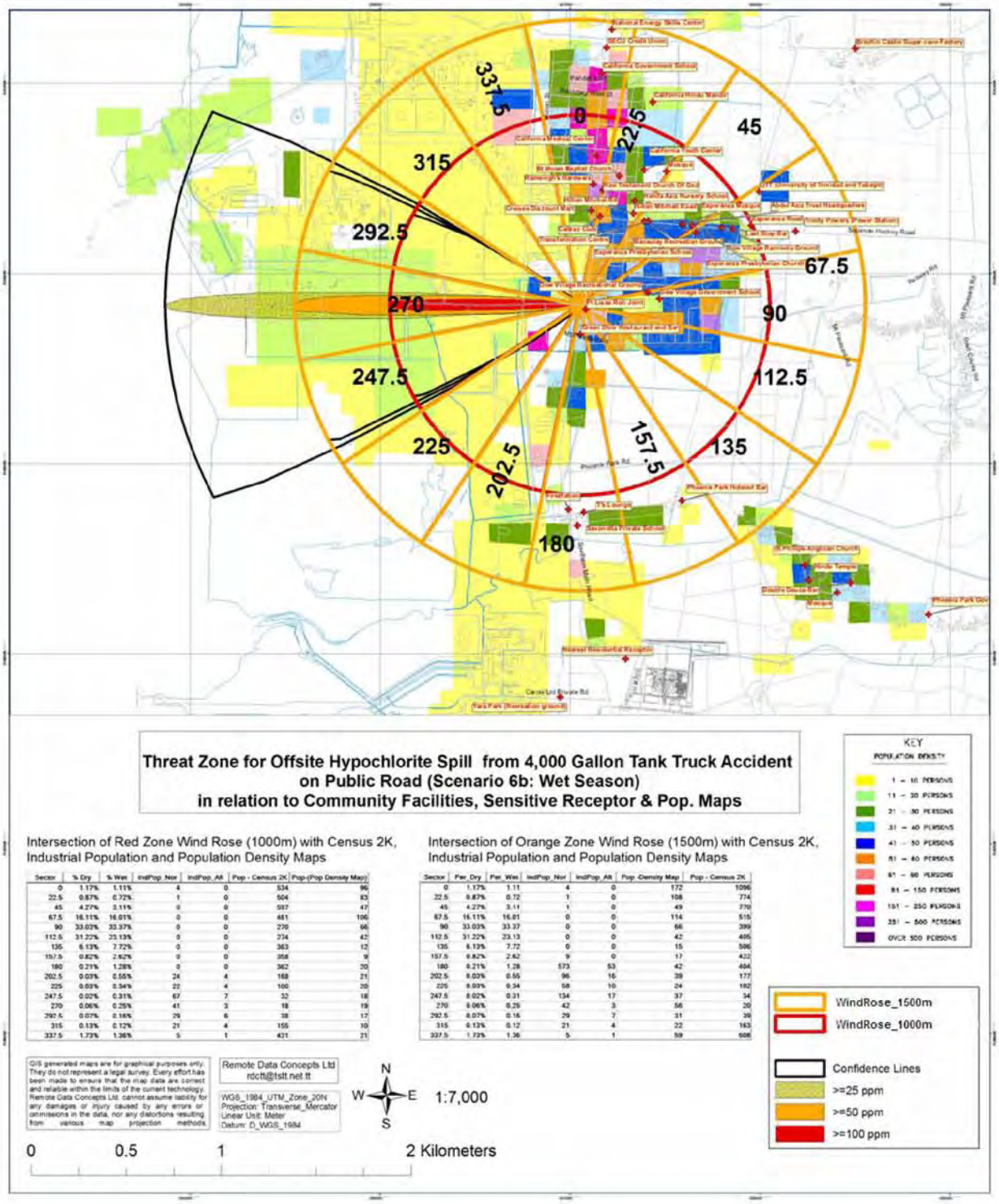


Figure 5.2-17a. Threat zone for offsite spill of hypochlorite from 4,000-gallon tank truck accident on public road (Scenario 6.b: Wet Season) in relation to time-weighted population.



Intersection of Red Zone Wind Rose (1000m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	indPop_Nor	indPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	4	0	534	96
22.5	0.87%	0.72%	1	0	504	83
45	4.27%	3.11%	0	0	597	47
67.5	16.11%	16.01%	0	0	461	106
90	33.03%	33.37%	0	0	270	66
112.5	31.22%	23.13%	0	0	234	42
135	6.13%	7.72%	0	0	363	12
157.5	0.82%	2.62%	0	0	358	9
180	0.21%	1.28%	0	0	362	20
202.5	0.03%	0.55%	24	4	168	21
225	0.03%	0.34%	22	4	100	20
247.5	0.02%	0.31%	67	7	32	18
270	0.06%	0.25%	41	3	18	19
292.5	0.07%	0.16%	29	6	38	17
315	0.13%	0.12%	21	4	155	10
337.5	1.73%	1.36%	5	1	431	21

Intersection of Orange Zone Wind Rose (1500m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	indPop_Nor	indPop_Alt	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	4	0	172	1096
22.5	0.87%	0.72	1	0	108	774
45	4.27%	3.11	1	0	49	770
67.5	16.11%	16.01	0	0	114	515
90	33.03%	33.37	0	0	66	399
112.5	31.22%	23.13	0	0	42	405
135	6.13%	7.72	0	0	15	506
157.5	0.82%	2.62	9	0	17	422
180	0.21%	1.28	573	53	42	404
202.5	0.03%	0.55	96	16	39	177
225	0.03%	0.34	58	10	24	192
247.5	0.02%	0.31	134	17	37	34
270	0.06%	0.25	42	3	56	20
292.5	0.07%	0.16	29	7	31	39
315	0.13%	0.12	21	4	22	163
337.5	1.73%	1.36	5	1	59	608

Figure 5.2-17b. Threat Zone for offsite spill of hypochlorite from 4,000-gallon tank truck accident on public road (Scenario 6.b: Wet Season) in relation to community facilities and sensitive receptors.

valves in the natural gas piping system that would minimize the volume of natural gas that could be released in such an event. Natural gas deflagration resulting from a natural gas leak and subsequent ignition at the point of release is described above and modelled under Scenario 4.a.

5.2.7.2 Scenario 7.b. Boiler Control Failure, Steam Boiler System

Pressure sensors that continuously monitor operating pressure in the steam boiler system would normally detect overpressure events in the steam boiler system. Overpressure events would be relieved by pressure relief valves that would activate in the event that design-operating pressures are exceeded in the system.

Overpressure events resulting in explosion and subsequent pressure release were estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of overpressure events would be minimized by preventive maintenance, scheduled inspection of pressure vessels, and proper operation of the steam boiler system pressure control system.

5.2.7.3 Scenario 7.c. Natural Gas Leak, 77% or 94% Calcium Chloride Drying

A natural gas leak from the $CaCl_2$ drying process resulting in ignition and fire was estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event, as well as property damage. Natural gas leaks would generally be detected directly by employees' sense of smell, through inspection of the natural gas piping, or through continuous monitoring of the natural gas system pressure. The frequency of such events would be minimized by routine preventive maintenance of natural gas piping and associated equipment. The consequences of such events would be minimized by excess flow valves in the natural gas piping system that would minimize the volume of natural gas that could be released in such an event. Natural gas deflagration resulting from a natural gas leak and subsequent ignition at the point of release is described above and modelled under Scenario 4.a.

5.2.7.4 Scenario 7.d. Reverse H_2: Cl_2 Ratio, Hydrochloric Acid Units

An explosion event resulting from reversal of the ratio of H2 and Cl2 in the hydrochloric acid unit was estimated in the HAZID analysis to have a likelihood (probability) rating of 5, indicating that such events may occur within the 20-year operating life of the CariSal facility, and a severity (consequences) rating of 1, indicating the potential for only minor onsite injuries and minimal property damage from such an event. The frequency of such events would be minimized by the process design and process interlocks to prevent ratio reversal, and by inclusion of rupture disks in the process design of the hydrochloric acid unit. The rupture disk would release overpressure in the hypochlorite unit to an area removed from personnel, minimizing the potential for explosion and minimizing the potential for personnel exposure to HCl.

5.2.7.5 Scenario 7.e. Absorption Tower Deflagration, Hypochlorite Units

Failure of dilution air flow (e.g., due to compressor failure) in the hypochlorite unit was estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of hypochlorite stack ignition events would be minimized through the process design for reliability of the dilution air supply. Any ignition of the hypochlorite stack would cause the purge gas system to activate, venting *nitrogen gas* to the hypochlorite stack to extinguish the fire, which would minimize the consequences of an ignition event (CariSal Limited 2007). The presence of water vapour in the hypochlorite stack exhaust gas may also reduce the potential for ignition by diluting the hydrogen and oxygen mixture to concentrations below the hydrogen LEL.

5.2.7.6 Scenario 7.f. Membrane Pinhole Leak, Electrolysis Unit

Pinhole leaks resulting in an explosion within the equipment were estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event, as well as property damage. Pinhole leaks would be detected in the equipment through the module voltage monitoring system. The frequency of pinhole leak events would be minimized through proper operation of the electrolysis unit; modules are always flooded during normal operation by means of a high-reliability pumping system consisting of two pumps in parallel with auto-changeover control and backup power supply. Any unit shut down would activate the purge gas system that would vent excess chlorine gas to the absorption tower and excess hydrogen gas to the hydrogen vent stack.

5.2.7.7 Scenario 7.g. Hydrogen Stack Ignition (Lightning)

Ignition of the hydrogen stack was estimated in the HAZID analysis to have a likelihood (probability) rating of 5, indicating that such events may occur within the 20-year operating life of the CariSal facility, and a severity (consequences) rating of 1, indicating the potential for only minor onsite injuries and minimal property damage from such an event. The frequency of hydrogen stack ignition events would be reduced by including an "air terminal (lightning rod) in the stack design (CariSal Limited 2007) Ignition of the hydrogen stack would cause the purge gas system to activate, venting *nitrogen gas* to the hydrogen stack to extinguish the fire, which would minimize the consequences of an ignition event (CariSal Limited 2007).

5.2.7.8 Scenario 7.h. Membrane Fire

Operation of the electrolyser empty of process fluids was estimated in the HAZID analysis to have a likelihood (probability) rating of 4, indicating that such events could occur at a frequency of 1 in 100 years and potentially within the 20-year operating life of the facility, and a severity (consequences) rating of 1, indicating the potential for minor onsite injuries and only minimal property damage from such an event. Dry operation of the electrolyser would be detected through the module voltage monitoring system. The frequency of such events would be minimized through proper operation of the electrolysis unit; modules are always flooded during

normal operation by means of a high-reliability pumping system consisting of two pumps in parallel with auto-changeover control and backup power supply. Any unit shut down would activate the purge gas system that would vent excess chlorine gas to the absorption tower and excess hydrogen gas to the hydrogen vent stack.

5.2.7.9 Scenario 7.i. Transformer/Rectifier Fire

A transformer/rectifier event was estimated in the HAZID analysis to have a likelihood (probability) rating of 5, indicating that such events may occur within the 20-year operating life of the CariSal facility, and a severity (consequences) rating of 3, indicating the potential for significant property damage and extended electrolyser unit shut down. The frequency of such events would be minimized through routine preventive maintenance of the transformer/rectifiers.

Each transformer/rectifier unit and each parallel electrolyser unit are designed to operate independently of the other transformer/rectifier and electrolyser unit (CariSal Limited 2007); a fire affecting one transformer/rectifier would therefore not affect the other. In the event of a fire affecting one unit, standard plant emergency shut down procedures and emergency response would be initiated. The affected electrolyser unit would need to be shut down for extended repair but the other unit could remain in operation.

5.2.7.10 Scenario 7j. Gasket Breach, Electrolysis Module

An electrolyser module gasket breach and resulting vessel or piping failure would be detected by the cell room hydrogen analyzer that continuously monitors for detection of hydrogen gas in the cell room. Detection of hydrogen in the cell room would implement a voltage alarm and interlock that would result in shut down of the module and activation of the purge gas system to vent the hydrogen to the hydrogen stack. Hydrogen gas released into the cell room would be exhausted to the atmosphere through the cell ventilation system (see Scenario 3.a.1. in Section 5.2.3.1 above.)

Failure of a single gasket was estimated in the HAZID analysis to have a likelihood (probability) rating of 5, indicating that such events may occur within the 20-year operating life of the CariSal facility, and a severity (consequences) rating of 1, indicating the potential for only minor onsite injuries from such an event. Simultaneous failure of multiple gaskets, which would result in the release of a larger amount of chlorine gas, was estimated to have a likelihood (probability) rating of 1, indicating that such events should not occur within the 20-year operating life of the facility, and a severity (consequences) rating of 2, indicating the potential for serious (temporarily disabling) onsite injuries. The frequency of gasket breaches would be minimized through preventive maintenance and continuous monitoring of module operating pressure and proper operation of the pressure control system. The cell room hydrogen analyzer would provide early detection of any hydrogen release.

5.2.7.11 Scenario 7.k. Piping Failure, Electrolysis Unit

Failure of the hydrogen header pipe and resulting hydrogen release to the cell room would be detected by the cell room hydrogen analyzer, as described in Section 5.7.2.10 under Scenario 7.j. above. Emergency shut down and response procedures would be as described above. Potential

hydrogen gas releases from the cell room would be vented through the cell ventilation system (see Scenario 3.a.1. in Section 5.2.3.1 above.)

Failure of a hydrogen header pipe was estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility. Failure of a chlorine header pipe was estimated to have a likelihood (probability) rating of 4, indicating that such events could occur at a frequency of 1 in 100 years and potentially within the 20-year operating life of the facility. Both the hydrogen header pipe and chlorine header pipe events were estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of header pipe failures would be minimized through preventive maintenance and continuous monitoring of module operating pressure and proper operation of the pressure control system. Potential consequences of personnel exposure to released chlorine gas in the cell room would be minimized because the cell room hydrogen analyzer would provide early detection of any release.

5.2.8 Onsite Hazardous Materials Release Scenarios

Onsite hazardous materials release scenarios evaluated in this Risk Assessment are identified in Table 4.1.2. Potential onsite consequences to employees, contractors, and visitors, and control and mitigation measures for these scenarios are described in this section. These scenarios are not anticipated to result in offsite consequences to the public. Scenarios having the potential for offsite consequences to the public and for which quantitative modelling has been conducted are discussed in Sections 5.2.1 through 5.2.6 above.

5.2.8.1 Scenario 8.a. Vessel Failure, Steam Boiler System

Pressure sensors that continuously monitor operating pressure in the steam boiler system would normally detect overpressure events in the steam boiler system. Overpressure events would be relieved by pressure relief valves that would activate in the event that design-operating pressures are exceeded in the system.

Overpressure events resulting in vessel failure and subsequent release of steam were estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of overpressure events would be minimized by preventive maintenance, scheduled inspection of pressure vessels, and proper operation of the steam boiler system pressure control system.

5.2.8.2 Scenario 8.b. Vessel Failure, Calcium Chloride Production

Pressure sensors that continuously monitor operating pressure in the system would normally detect overpressure or under pressure events in the calcium chloride production process. Overpressure events would be relieved by pressure relief valves that would activate in the event that design-operating pressures are exceeded in the system.

Overpressure events resulting in vessel failure and subsequent release of HCl were estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year economic life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of overpressure or under-pressure events resulting from process upsets would be minimized proper operation of the calcium chloride process pressure control system. The frequency of events resulting from vessel corrosion would be minimized by preventive maintenance and scheduled inspection of process reaction vessels.

Any HCl release from vessel failure would be contained in the plant room sump and drain system for subsequent treatment and disposal and would therefore not represent an environmental hazard or result in any offsite consequences.

5.2.8.3 Scenario 8.c. Piping Failure, Calcium Chloride Production

Mechanical failure of piping associated with the limestone reaction vessel was estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of such events would be minimized by routine preventive maintenance and inspection of process piping and associated equipment. The consequences of such events would be minimized by excess flow valves in the natural gas piping system that would minimize the volume of material that could be released in such an event.

Any HCl release from piping failure would be contained in the plant room sump and drain system for subsequent treatment and disposal and would therefore not represent an environmental hazard or result in any offsite consequences.

5.2.8.4 Scenario 8.d. Vessel Failure, Caustic Evaporation Unit

Vessel failure in the caustic evaporation unit and subsequent leakage of NaOH was estimated to have a likelihood (probability) rating of 4, indicating that such events could occur at a frequency of 1 in 100 years and potentially within the 20-year operating life of the facility, and a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event.

Mechanical failure of plate heat exchanger internals in the caustic evaporation unit would be detected by conductivity meters that continuously monitor the conductivity of the condensate and cooling water in the process. A change in the conductivity outside of process design conditions would indicate that leakage of 32% to 50% caustic into the cooling water or condensate is occurring. The caustic evaporation process is designed such that the pressure of the cooling water would be higher than the pressure of the NaOH under normal operating conditions, reducing the likelihood of leakage of the NaOH into the cooling water system. Potential exposure of personnel to cooling water or condensate containing NaOH is not likely because the conductivity meters would provide early detection of any leakage and the leaked material would be contained in the cooling water or condensate system.

5.2.8.5 Scenario 8.e. Piping Failure, Caustic Evaporation Unit

Mechanical failure of piping was estimated to have a likelihood (probability) rating of 4, indicating that such events could occur at a frequency of 1 in 100 years and potentially within the 20-year operating life of the facility, and a severity (consequences) rating of 1, indicating the potential for minor onsite injuries from such an event.

Employees conducting routine operations would detect minor leaks of NaOH from process piping. The potential for exposure of personnel to NaOH from minor leaks is low because employees are trained to detect leaks and avoid physical contact with leaked materials. Employees would implement standard operating procedures for response to and cleanup of the leaked materials. Any caustic release from the piping would be contained in the plant room sump and drain system for subsequent treatment and disposal and would therefore not represent an environmental hazard or result in any offsite consequences.

5.2.8.6 Scenario 8.f. System Over/Under-pressure, Caustic Evaporation Unit

Failure of the vacuum pump or steam supply to the caustic evaporation unit and subsequent release of NaOH was estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. Pressure sensors in the caustic evaporation unit that continuously monitor system pressure would detect over or under pressure events. The frequency of such events would be minimized through routine maintenance and inspection of the vacuum pump and steam supply system, and the consequences of over or under-pressure events would be minimized through design of pipe-work and vessels for maximum allowable pressure. Any caustic release from the unit would be contained in the plant room sump and drain system for subsequent treatment and disposal and would therefore not represent an environmental hazard or result in any offsite consequences.

5.2.8.7 Scenario 8.g. Vessel Failure, Hypochlorite Unit

Mechanical failure of a vessel in the hypochlorite unit and subsequent release of HCl gas was estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. Process design features and specification of vessel material construction that protect against failure would minimize the frequency of such events. Interlock systems are provided in the process design to monitor and control the flow of cooling water and demineralised water to prevent exposure of the vessel to thermal shock. Any release of HCl gas from outdoor equipment would be dispersed into the atmosphere.

5.2.8.8 Scenario 8.h. Vessel Failure, Electrolysis Unit

Mechanical failure of a vessel in the electrolysis unit was estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling)

injuries from such an event. The frequency of such events would be minimized by process design features and specification of vessel material of construction that protect against failure and by routine preventive maintenance and proper operating procedures.

Under this scenario, a vessel in the electrolysis process (brine dechlorination) experiences mechanical failure. Three potential failure events are included under Scenario 8.h. involve failure of the physical dechlorination vessel, chlorate destruction vessel, and chemical dechlorination vessel. The cell room ventilation system would disperse the chlorine, and liquid releases from the vessel would be contained in the cell room sump and drain system. "Strong effluent" released from the process would be air-blown to remove any free chlorine. The chlorine-containing air from the strong effluent treatment process would be vented through the bleach plant to absorb the free chlorine. Potential chlorine gas releases from the cell room are modelled under Scenario 1.a. 1.

5.2.8.9 Scenario 8.i. Piping Failure, Electrolysis Unit

Mechanical failure of piping in the electrolysis unit was estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of such events would be minimized by process design features and specification of piping material of construction and design pressure specifications that protect against failure and by routine preventive maintenance and proper operating procedures. Process piping failures could be related to piping associated with the physical dechlorination vessel, chlorate destruction vessel, or chemical dechlorination vessel. Potential releases from mechanical failure of piping would be as described under Scenario 8.h.1, 8.h.2, and 8.h.3 depending upon which vessel the failed process piping is associated with. These three piping failure scenario events are Scenario 8.i.1, 8.i.2, and 8.i.3.

5.2.8.10 Scenario 8.j. Gasket Breach, Electrolysis Module

An electrolyser module gasket breach and resulting vessel or piping failure would be detected by the cell room chlorine analyzer that continuously monitors for detection of chlorine gas in the cell room. Detection of chlorine in the cell room would implement a voltage alarm and interlock that would result in shut down of the module and activation of the purge gas system. Chlorine gas contained in the process equipment would be vented with the purge gas through the bleach plant where the chlorine gas would be absorbed. Chlorine gas released into the cell room would be exhausted to the atmosphere through the cell ventilation system (see Scenario 1.a. 1. in Section 5.2.1.1 above.)

Failure of a single gasket was estimated in the HAZID analysis to have a likelihood (probability) rating of 5, indicating that such events may occur within the 20-year operating life of the CariSal facility, and a severity (consequences) rating of 1, indicating the potential for only minor onsite injuries from such an event. Simultaneous failure of multiple gaskets, which would result in the release of a larger amount of chlorine gas, was estimated to have a likelihood (probability) rating of 1, indicating that such events should not occur within the 20-year operating life of the facility, and a severity (consequences) rating of 2, indicating the potential for serious (temporarily

disabling) onsite injuries. The frequency of gasket breaches would be minimized through preventive maintenance and continuous monitoring of module operating pressure and proper operation of the pressure control system. Potential consequences of personnel exposure to released chlorine gas in the cell room would be minimized because the cell room chlorine analyzer would provide early detection of any chlorine release.

5.2.8.11 Scenario 8.k. Piping Failure, Electrolysis Unit

Scenario 8.k.1 Chlorine Header Pipe Gasket Failure Scenario

Failure of the electrolyser chlorine header pipe gasket and resulting release of chlorine and hot depleted brine to the cell room would be detected by the cell room chlorine analyzer, as described in Section 5.8.2.10 under Scenario 8.j. above. Emergency shut down and response procedures would be as described above. Chlorine released into the cell room would be vented through the cell room ventilation system (see Scenario 1.a.1. in Section 5.2.1.1 above.)

Scenario 8.k.2 Hydrogen Header Pipe Failure Scenario

Failure of the hydrogen header pipe and resulting release of hot 32% caustic to the cell room would result in implementation of emergency shut down and response procedures as described above. Caustic released would be contained in the cell room sump and drain system, minimizing the potential for personnel exposure.

Failure of a hydrogen header pipe was estimated in the HAZID analysis to have a likelihood (probability) rating of 3, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility. Failure of a chlorine header pipe was estimated to have a likelihood (probability) rating of 4, indicating that such events could occur at a frequency of 1 in 100 years and potentially within the 20-year operating life of the facility. Both the hydrogen header pipe and chlorine header pipe events were estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. The frequency of header pipe failures would be minimized through preventive maintenance and continuous monitoring of module operating pressure and proper operation of the pressure control system. Potential consequences of personnel exposure to released chlorine gas in the cell room would be minimized because the cell room chlorine and hydrogen analyzers would provide early detection of any release.

5.2.8.12 Scenario 8.l. Piping Failure, Secondary Brine Treatment

Mechanical failure of piping in the secondary brine treatment unit was estimated in the HAZID analysis to have a likelihood (probability) rating of 2, indicating that such events are not likely to occur within the 20-year operating life of the CariSal facility, and estimated to have a severity (consequences) rating of 2, indicating the potential for serious onsite (temporarily disabling) injuries from such an event. Process design features, specification of materials used for piping construction, design pressure specifications that protect against failure, routine preventive maintenance and proper operating procedures would minimize the frequency of such events. Caustic or hydrochloric acid released would be contained in the production area sump and drain system, minimizing the potential for personnel exposure.

5.3 QUANTITATIVE CONSEQUENCE ANALYSIS SUMMARY

Accidental release modelling was conducted for the risk assessment for onsite and offsite accidental release scenarios for potential releases of hazardous materials, including chlorine, hydrochloric acid, and sodium hypochlorite resulting in human exposure, and for potential releases of natural gas resulting in fire or explosion. The risk associated with each scenario was assessed based on the severity (consequences) of a release and the probability (frequency) of a release. Quantitative consequence modelling was conducted for the scenarios listed in Table 5.1-1.

Table 5.1-1. Accident Scenarios for which Quantitative Modelling was Conducted

No.	Scenario	Type	Event Frequency
1.	*Onsite hazardous material (gaseous) release*		
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	$1x10^{-6}$
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	$1x10^{-6}$
1.a.3	Chlorine [outdoor] process pipe breach [seismic event]	Cl_2 release	$1x10^{-6}$
1.b	Intermixing of hypochlorite with HCl	Cl_2 release	$1x10^{-7}$
2.	*Onsite hazardous material (liquid) release*		
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	$1x10^{-6}$
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	$1x10^{-6}$
3.	*Flammable gas release (dispersion)*		
3.a.1	Hydrogen [indoor] process pipe breach	H_2 release	$1x10^{-6}$
3.a.2	Hydrogen [outdoor] process pipe breach	H_2 release	$1x10^{-6}$
3.a.3	Hydrogen [outdoor] process pipe breach [seismic event]	H_2 release	$1x10^{-6}$
3.b.	Hydrogen vent stack release/HCl scrubber stack release	H_2 release	$1x10^{-6}$
4.	*Flammable gas release (deflagration)*		
4.a	Onsite natural gas deflagration	CH_4 release	$1x10^{-6}$
4.b	Offsite natural gas deflagration	CH_4 release	$1x10^{-6}$
6.	*Offsite transportation hazardous material release*		
6.a	Hydrochloric acid: 4,000-gallon tank truck accident	HCl spill	$3x10^{-7}$
6.b	Hypochlorite: 4,000-gallon tank truck accident	bleach spill	$3x10^{-7}$

Reference: Conve & AVS Inc. 2007.
Reference: Crowl and Louvar 2001
Reference: Craft 2004

Event frequency (probability) and severity (consequences) ratings for each onsite accident event in Table 5.1-1 are taken from the Process Hazard and Environmental Risks (HAZID) document and were used for the purposes of initial risk ranking and selection of scenarios for quantitative modelling. The severity and probability ratings of offsite transportation accidents (Scenarios 6.a. and 6.b.) were estimated to be similar to that for onsite vessel failure for the purposes of the

initial risk ranking of the accident scenarios. The scenarios in Table 5.1-1 are quantitatively modelled in the risk assessment to assess the potential for impacts to the offsite population. Modelling calculations include the total material released either from a vessel or pipeline.

Event frequencies for onsite accident scenarios (Scenarios 1 through 5) shown in Table 5.1-1 were estimated based on CariSal facility design standards. The CariSal facility will be designed in accordance with industry design standards for chlor-alkali plants, including systems and equipment containing chlorine, process pipes, and storage vessels. These include guidelines published by the Chlorine Institute, International Electrotechnical Commission, and other technical standards organizations.

The CariSal facility a design standard is to have all systems and equipment containing chlorine have a failure rate of less than 1×10^{-6}. The anticipated residual failure rate for process and storage vessels is also less than 1×10^{-6} (Crowl and Louvar, 2001). The CariSal facility design of the hypochlorite and hydrochloric acid storage and product loading systems is such that inadvertent mixing of hypochlorite and hydrochloric acid is not a credible scenario. The hydrochloric acid and hypochlorite trucks would be designed with incompatible nozzles that would preclude hydrochloric acid from being loaded into hypochlorite trucks, or vice versa. Therefore for the purposes of the analysis of individual and societal risk, this scenario (Scenario 1.b) is considered to have an event frequency of 1×10^{-7}. Event frequencies of 1×10^{-6} were applied for the other onsite accidental release scenarios to estimate individual and societal risk. Event frequencies represent the probability of occurrence of the event; exposure probabilities represent the probability that an individual would be exposed to the consequences of the event (including, for example, the probability that a residence in the area of influence of the event is actually occupied at the time of the event.) Event frequencies applied to estimate individual and societal risk for each offsite release event in Table 5.1-1 are estimated from hazardous materials transportation data published by the U.S. Federal Motor Carrier Safety Administration (FMCSA) (Craft 2001).

The U.S. Federal Motor Carrier Safety Administration (U.S. FMCSA) published data concerning crashes of trucks carrying hazardous materials (Craft, 2001). The data are from 1991 through 2000. During that period, an average of approximately 800,000 hazardous materials truck shipments occurred each day, corresponding to approximately 292 million shipments per year. The average number of fatal accidents involving trucks carrying hazardous materials was approximately 200 during that period, and the average number of non-fatal accidents involving trucks carrying hazardous materials was approximately 5,000. Approximately 67% of fatal accidents (134 accidents per year) and 69% of non-fatal accidents (3,450 accidents per year) involved cargo tank trucks, and approximately 36% of cargo tank truck accidents involving a fatality also involved a partial or complete loss of cargo (48.24 accidents per year). Of the approximately 5,000 non-fatal accidents per year, approximately 90 involved an injury related to exposure to hazardous material. Of those 90, 69% involved cargo tank trucks (62.1 accidents per year). 55% of the cargo is hazardous materials, thus 34.16 non-fatal accidents per year involved exposure to hazardous material from cargo tank trucks. Collectively these data indicate an average of approximately 84 incidents per year involving either a fatality and loss of cargo or an injury related to hazardous material exposure. This corresponds to an incident rate of approximately 3×10^{-7}.

Note that these event frequencies are different from and lower than those in the Process Hazard and Environmental Risks (HAZID) document because the HAZID does not account for redundancies designed into the CariSal process. Note also that the event frequency for each scenario are not equivalent to the to exposure probability for the scenario, as the exposure probability also takes into account, for example, the probability that an offsite residence will actually be occupied at the time of an accidental release. The scenarios in Table 5.1-1 are quantitatively modelled in the risk assessment to assess the potential for impacts to the offsite population.

Modelling of onsite flammable gas releases of hydrogen and natural gas did not indicate a potential for danger to the offsite population. Modelling of offsite flammable gas releases of natural gas from the tie-in with the natural gas utility pipeline indicated a potential for explosion (Release Scenario 4.b). The modelled radius of effect of a natural gas explosion resulting from a natural gas leak from the tie-in and subsequent ignition is approximately 300 m from the point of ignition; at 300 m from the point of ignition buildings could be destroyed. At 311 m from the point of ignition there is the potential for serious injury to persons. These distances of impact extend beyond the CariSal site boundary. Impacts from Release Scenario 4.b are depicted in Figure 5.2-14a.

Modelling of onsite accidental releases of chlorine from process equipment indicated the potential for exceedance of the immediately dangerous to life and health (IDLH) concentration for chlorine of 10 parts per million (ppm) at offsite locations. Modelling indicates that, for an outdoor release of chlorine gas from onsite process equipment (Release Scenario 1.a.2), the IDLH concentration would be exceeded at 1,500 m (1.5 kilometres) from the point of release on the CariSal plant site. Modelling indicates that, for an outdoor release of chlorine gas from onsite process equipment affected by a seismic event (Release Scenario 1.a.3, which is assumed to affect both process lines), the IDLH concentration for chlorine would be exceeded at 1,800 metres (1.8 kilometres) from the point of release on the CariSal site. Impacts from Release Scenario 1.a.2 are depicted in Figure 5.2-4a. Impacts from Release Scenario 1.a.3 are depicted in Figure 5.2.7a.

Modelling of accidental releases of hydrochloric acid from onsite storage tanks indicated the potential for exceedance of the IDLH concentration for hydrogen chloride gas of 50 ppm at offsite locations. A spill of hydrochloric acid into the storage tank secondary containment system could release hydrogen chloride gas to the atmosphere. Modelling indicates that for a spill of the entire contents of the 400,000-gal (1,514-m^3) hydrochloric acid storage tank capacity (Release Scenario 2.b), the IDLH concentration for hydrogen chloride gas would be exceeded at 2,500 m (2.5 km) from the point of release on the CariSal plant site. Impacts from Release Scenario 2.b are depicted in Figure 5.2-12a.

Modelling of accidental releases of liquid bleach from onsite storage tanks indicated the potential for exceedance of the IDLH concentration for hydrogen chloride gas of 50 ppm at offsite locations. Vapour pressure data for sodium hypochlorite solutions were obtained from page 6 of the Sodium Hypochlorite Manual (Chlorine Institute Pamphlet 96, Edition 3) for use in modelling accidental releases. Liquid spills of bleach into the storage tank secondary containment system or onto pavement could release chlorine monoxide gas to the atmosphere under certain conditions, including the presence of metals that could catalyze a chemical

decomposition reaction. Metal catalysts are not likely to be present to interact with or decompose the bleach, and therefore generation of chlorine monoxide during a spill event is very unlikely to occur. The accidental release scenarios for liquid bleach spills are based on chlorine monoxide release in order to provide a conservative assessment.

The IDLH for hydrogen chloride gas is used as a surrogate for chlorine monoxide gas, for which there is no established IDLH concentration. Modelling indicates that for a spill of the entire bleach storage tank capacity into the secondary containment system (Release Scenario 2.c), the IDLH concentration for hydrogen chloride gas would be exceeded at 720 metres from the point of release on the CariSal plant site. Such a release could affect the offsite residential population and offsite industrial plant workers depending on the wind direction at the time of a release. For the prevailing wind direction from the east (wind direction 90 degrees) approximately 18 persons reside within the area of impact. Impacts from Release Scenario 2.c are depicted in Figure 5.2-13a.

Hydrochloric acid solution would be transported from the CariSal site to local customers and exported. Liquid spills of hydrochloric acid could release hydrogen chloride gas to the atmosphere. Modelling of offsite releases of liquid hydrochloric acid from transportation accidents indicates that the IDLH concentration for hydrogen chloride gas of 50 ppm would be exceeded at 3,300 m (3.3 km) from the point of release. An offsite transportation accident could occur at any point along the transportation route from the CariSal site to the customer locations. The specific point of release for the Scenario 6.a modelling was selected because it is adjacent to several industrial facilities and close to a population centre. Impacts from Release Scenario 6.a are depicted in Figure 5.2-15a.

Sodium hypochlorite (bleach) solution would be transported from the CariSal site to Savonetta Pier #4 in tank trucks. Liquid spills of bleach could release chlorine monoxide gas to the atmosphere if a spill occurs. The IDLH for hydrogen chloride gas is used as a surrogate for chlorine monoxide gas, for which there is no established IDLH concentration. Modelling of offsite releases from liquid bleach from transportation accidents indicates that the IDLH concentration for hydrogen chloride gas of 50 ppm would be exceeded at 1,500 m (1.5 km) from the point of release. An offsite transportation accident could occur at any point along the transportation route from the CariSal plant to Savonetta Pier #4. The specific point of release for the Scenario 6.b modelling was selected because it is adjacent to several industrial facilities and close to a population centre. Impacts from Release Scenario 6.b are depicted in Figure 5.2-17a.

5.4 Onsite Fire and Explosion Scenario Summary

Under the onsite fire and explosion scenarios described in Section 5.2.7, the potential exists for exposure of personnel to fire, heat or blast. Personnel exposed to potential hazards include employees in the steam boiler unit, calcium chloride drying unit, and other areas of the facility containing natural gas piping. Employees in the steam boiler unit would also be exposed to potential hazards including vessel failure and subsequent explosion or steam pressure release. Contractors working in these areas would be exposed to similar potential hazards. Visitors to the CariSal facility would not generally be permitted access to the production areas of the facility and would therefore not be exposed to the same hazards as employees or contractors.

Table 4.1-2 summarizes the probability rating, severity rating, and initial risk rating of onsite fire and explosion scenarios identified in the HAZID. With respect to risk ranking, several of the identified hazards have a risk rating of "C," including explosion in the hypochlorite unit (scenario 7.d), and electrolyser unit (scenario 7.f), hydrogen release (and potential ignition) in the electrolyser unit (scenarios 7.j and 7.k) and hydrogen stack ignition (scenario 7.g). Scenarios 7.d, 7.h, and 7.j reached a risk rating of "C" on account of their relatively high probability rating "5," the highest rating, while having a severity rating of "1," the lowest rating. Scenarios 7.f. and 7.k. have severity ratings of "2."

The potential for property damage is one component of the severity rating (as shown in Table 1.5-2) in addition to the potential for personnel exposure. Onsite fire and explosion scenarios identified in the HAZID have severity ratings of "1" or "2" (corresponding to potential serious onsite (temporary disabling) injuries) with the exception of the transformer/rectifier fire (scenario 7. 1), which has a severity rating of "3." a probability rating of "5," and an overall risk rating of "D." The severity rating of this scenario is based in part on the potential for property damage. As discussed above, a transformer/rectifier fire would result in extended shut down of the associated electrolyser unit and result in temporary loss of plant production capacity.

Quantitative consequence analyses for natural gas releases and subsequent ignition are described in Section 5.2.4, and quantitative consequence analyses for hydrogen releases are described in Section 5.2.3.

5.5 Onsite Hazardous Materials Release Scenario Summary

Under the hazardous materials release scenarios described in Section 5.2.8 the potential exists for exposure of personnel to hydrochloric acid, caustic, chlorine, or hypochlorite from a major [instantaneous] leak resulting from vessel or piping failure if personnel were in the vicinity and were unable to avoid physical contact with the leaked material. Personnel exposed to potential hazards include employees working in the electrolysis unit cell room, hypochlorite unit, caustic evaporation unit, calcium chloride unit, and hydrochloric acid and hypochlorite product loading areas, including employees working in the vicinity of intermediate and product storage tanks. Contractors working in these areas, including drivers of product delivery trucks entering the loading area would be exposed to similar potential hazards. Minor leaks and spills of hazardous materials are anticipated to result in only minor personnel exposure, because personnel are trained in the use of personal protective equipment and trained to avoid contact with released material, and because any hazardous material releases would be subject to prompt response in accordance with the CariSal Emergency Response Plan.

As discussed in Section 2.4, visitors to the plant would not generally be permitted access to these process areas and therefore would not generally be exposed to the same hazards as employees and contractors.

Workers in the electrolysis unit, in particular, could be potentially exposed to accidental releases of chlorine gas. However, the safety systems incorporated into the design and operation of the electrolysis unit, described in Section 2.4, serve to reduce the probability and severity of chlorine gas release scenarios (e.g., cell room chlorine monitors, personal protective equipment, and

escape respirators.) Therefore no onsite hazard material release scenario identified in the HAZID has a severity rating greater than "2" corresponding to potential serious onsite temporary disabling injuries.

Table 4.1-2 summarizes the probability rating, severity rating, and initial risk rating of onsite hazardous materials release scenarios identified in the HAZID. With respect to risk ranking, several of the identified hazards have a risk rating of "C," including piping and gasket failures in the electrolyser unit (chlorine gas or caustic release) and piping and vessel failures in the calcium chloride production unit (HCl spill) and caustic evaporation unit (NaOH spill.) These include scenarios 8.j and 8.k and 8.b, 8.c, and 8.d.

6.0 INDIVIDUAL RISK

6.1 DEFINITION OF INDIVIDUAL RISK

Individual risk is defined for hazardous materials release scenarios as the product of three component frequencies: the frequency of the hazardous materials release scenario event, the frequency that the event results in exceedance of a threshold (exposure) criteria concentration at a receptor location, and the frequency that the receptor location is occupied by persons.

$F_{(IR)} = F_{(P)} \times F_{(E)} \times F_{(O)}$ where

$F_{(IR)}$ = Individual Risk

$F_{(P)}$ = Frequency of Event Occurrence,
$F_{(E)}$ = Frequency of Exposure, and

$F_{(O)}$ = Frequency of Occupancy

Individual risk is defined for flammable materials release scenarios as the product of four component frequencies: the frequency of the flammable materials release scenario event, the frequency that the release results in ignition, the frequency that the resulting fire/explosion heat or blast reaches a receptor area, and the frequency that the receptor area would be occupied by persons.

$F_{(IR)} = F_{(P)} \times F_{(IG)} \times F_{(E)} \times F_{(O)}$ where

$F_{(IR)}$ = Individual Risk

$F_{(P)}$ = Frequency of Event Occurrence,
$F_{(IG)}$ = Frequency of Ignition

$F_{(E)}$ = Frequency of Exposure, and
$F_{(O)}$ = Frequency of Occupancy

These frequencies are defined in Sections 6.1.1, 6.1.2, 6.1.3, and 6.1.4.

6.1.1 Frequency of Event (Scenario) Occurrence

The frequency of event occurrence is based on the analysis conducted in preparing the HAZID and additional analyses for offsite accident scenarios that were not assessed in the HAZID. Accident scenario frequency ratings are summarized in Table 4.1-1 for onsite and offsite accident scenarios for which quantitative consequence analysis modelling was conducted, and in Table 4.1-2 for onsite fire and explosion and hazardous materials release scenarios. The *upper bound* of the likelihood (probability) rating for each accident scenario, as defined in Table 1.5-1, was used in estimating individual risk.

6.1.2 Frequency that Hazardous Material Release Results in Exceedance of Threshold (Exposure) Criteria at Receptor Location

The frequency that hazardous material release results in exceedance of threshold (exposure) criteria is based on the modelling results for accidental release scenarios 1, 2, 5, and 6 involving potential releases of chlorine, caustic, hydrochloric acid, and hypochlorite. The atmospheric dispersion models are applied to estimate the extent to which the concentration of the hazardous material released exceeds the threshold criteria. Threshold criteria for each hazardous material are listed in Table 1.5.5. Persons residing or working within the area in which the threshold criteria concentration is exceeded are deemed to have a probability of 1.0 of exposure to the threshold criterion concentration for the modelled duration of exposure. Persons outside of the area are deemed to have a probability of zero exposure to the threshold criterion concentration.

For the offsite transportation accidental release scenarios (Scenario 6.a. and Scenario 6.b.), the frequency of exposure is also based on the percentage of transportation accidents involving the tank truck that could result in the release of the entire contents of the tank truck.

6.1.3 Frequency that Flammable Material Release Results in Ignition and Heat or Blast at Receptor Location

For the purposes of the risk assessment it has been assumed that flammable materials encounter an ignition source and immediately ignite at the point of release and that there is no dispersion of the released flammable material to a remote ignition point. The probability of ignition is set at 1.0.

6.1.4 Frequency that Receptor Location Would Be Occupied

The frequency that a receptor location would be occupied at the time of a hazardous material release is estimated based on whether the receptor location is a workplace, residence, or public building. The risk assessment methodology assumes that public buildings and residences are occupied by persons 85 percent of the time. Employees at neighbouring industrial estate workplaces are deemed to be at work in accordance with their assigned shift. The number of employees located at each neighbouring industrial facility and their shift assignments are listed in Table 3.1-1. Employees occupy all neighbouring facilities identified, with the exception of the Petrotrin Compressor Station, 24 hours per day in either a two shift-operation or a three shift-operation. If the modelled concentration of a hazardous material release exceeds a threshold criteria concentration in the area of a neighbouring industrial facility, all of the employees working in the facility on that shift are deemed to be exposed to the threshold criteria concentration for the modelled duration of exposure.

6.2 DETERMINATION OF INDIVIDUAL RISK

Table 6.2-1 presents the calculation of individual risk as a product of the component frequencies described in Section 6.1.

Event frequencies shown in Table 6.2-1 for onsite hazardous materials release scenarios applied for the determination of individual risk are estimated based on the design standards and

guidelines for the CariSal facility process design. The event frequency for offsite hazardous materials release scenarios (transportation accident Scenarios 6.a. and 6.b.) applied for the determination of individual risk is estimated from data published by the FMCSA.

The frequency of exposure for all of the accidental release scenarios except for natural gas (Scenario 4.b) is set at the frequency at which the wind is towards the direction of the closest offsite receptor (i.e., wind from 112.5 degrees direction and towards 292.5 degrees direction.) Based on wind direction data, the average frequency of the wind being from this direction for the wet season and dry season is approximately 27 percent. The frequency of exposure (probability of ignition) for Scenario 4.b is assumed to be 100 percent. The zone of influence for Scenario 4.b. is not dependent on wind direction, as the scenario is based on the assumption that ignition of the natural gas occurs at the point of release. The frequency of occupation of residential structures is assumed to be 70 percent, that is, residential structures are occupied 70 percent of the time.

The individual risk is the product of the event frequency, frequency of exposure, and frequency of occupation. Scenarios for which no offsite consequences are estimated are assigned a risk of zero in Table 6.2-1.

The zone of influence for all of the hazardous material accidental release scenarios except for natural gas deflagration is defined as the zone in which the Immediately Dangerous to Life and Health (IDLH) concentration for the hazardous material is exceeded. For natural Scenario 4.b. (natural gas deflagration) the zone of influence is defined at the zone in which damage to buildings and structures could occur from the force of an explosion.

Table 6.2-1. Accident Scenario Individual Risk

No.	Scenario	Type	Event Frequency[a]	Frequency of Exposure[b]	Frequency of Occupation[c]	Risk[d]	Sensitive Receptor
	Onsite hazardous material (gaseous) release						
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twelve
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twelve
1.a.3	Chlorine process pipe breach [seismic event]	Cl_2 release	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twelve
1.b	Intermixing of Hypochlorite with HCl	Cl_2 release	$1x10^{-7}$[e]	0.27	0.7	$2x10^{-8}$	Six
	Onsite hazardous material (liquid) release						
2.a	Vessel Failure: Onsite NaOH storage tank	NaOH spill	$1x10^{-6}$	Zero	NA	Zero	None
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Twenty six
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	$1x10^{-6}$	0.27	0.7	$2x10^{-7}$	Two
3.	*Flammable gas release (dispersion)*						
3.a.1	Hydrogen [indoor] process pipe breach	H_2 release	$1x10^{-6}$	Zero	NA	Zero	None
3.a.2	Hydrogen [outdoor] process pipe breach	H_2 release	$1x10^{-6}$	Zero	NA	Zero	None
3.a.3	Hydrogen process pipe breach [seismic event]	H_2 release	$1x10^{-6}$	Zero	NA	Zero	None

Table 6.2-1. Accident Scenario Individual Risk

No.	Scenario	Type	Event Frequency[a]	Frequency of Exposure[b]	Frequency of Occupation[c]	Risk[d]	Sensitive Receptor
3.b.1 3.b.2	Hydrogen vent stack release HCl scrubber stack release	H_2 release H_2 release	$1x10^{-6}$ $1x10^{-6}$	Zero Zero	NA NA	Zero Zero	None None
4.	*Flammable gas release (deflagration)*						
4.a	Onsite Natural gas deflagration	CH_4 release	$1x10^{-6}$	Zero	NA	Zero	None
4.b	Offsite Natural gas deflagration	CH_4 release	$1x10^{-6}$	1.0	0.7	$3x10^{-7}$	None
5	*Offsite facility hazardous material release*						
5.a	Vessel Failure: Offsite EISL Facility caustic tank breach	NaOH spill	$1x10^{-6}$	Zero	NA	Zero	None
5.b	Offsite caustic pipeline breach	NaOH spill	$1x10^{-6}$	Zero	NA	*Zero*	None
6.	*Offsite transportation hazardous material release*						
6.a	Hydrochloric acid: 4,000 gallon tank truck accident	HCl spill	$3x10^{-7}$	0.27	0.7	$5x10^{-8}$	Forty
6.b	Hypochlorite: 4,000 gallon tank truck accident	bleach spill	$3x10^{-7}$	0.27	0.7	$5x10^{-8}$	Thirty two

[a] Event frequency is estimated based on the CariSal facility design standard and guidelines for Scenarios 1 through 5. Frequency of transportation accidents was estimated from data published by the FMCSA.

[b] Frequency of Exposure of "Zero" indicates that there are no modelled offsite consequences associated with this release scenario; frequency of exposure for accidental release scenarios is equal to the frequency of wind direction towards the closest offsite receptor (27%); frequency of exposure for natural gas deflagration scenarios is independent of wind direction, frequency of ignition is assumed to be 1.0

[c] Frequency of occupation is 0.7 for an offsite residence or public building

[d] NA = not applicable

[e] Event frequency based on application of incompatible truck nozzle design to hypochlorite and hydrochloric acid storage and loading equipment

Reference: Crowl and Louvar, 2001

Reference: Craft, 2000

6.3 Comparison to Common Hazards

Risks for the various scenarios shown in Table 6.2-1 are estimated as described in Section 6.2 above. For hazardous materials release scenarios and explosion scenarios, risk represents the probability that an individual would be within the zone of influence. The probability that an individual within the zone of influence (i.e., exposed to the IDLH concentration or to the force of the explosion) would experience fatality has not been estimated, nor are the effects of mitigation on the event frequency or consequences reflected in the risks shown in Table 6.2-1. For example, individuals sheltering in place in the event of a hazardous materials release would be within the zone of influence, but would not necessarily be exposed to the same hazardous material concentration as an individual remaining outdoors during a hazardous materials release. Mitigation actions to reduce the frequency or consequences of the various scenarios are discussed in the mitigation section of the EIA.

Table 6.3-1. Risk of Death from Common Hazards

Event	Probability of Death (per year)	Recurrence Interval (years)
From heart disease	2.94×10^{-3}	340
In a motor vehicle	2.00×10^{-4}	5,000
Breast cancer / Prostate cancer	1.43×10^{-4}	7,000
AIDS	5.26×10^{-5}	19,000
From a fall	5.00×10^{-5}	20,000
From a workplace accident	3.85×10^{-5}	26,000
Due to complications from surgery	1.25×10^{-5}	80,000
From food poisoning	1.16×10^{-5}	86,000
From choking	6.25×10^{-6}	160,000
In an airplane crash	4.00×10^{-6}	250,000

Source: EcoEngineering Consultants Limited 2006, page 47.

6.4 COMMUNITY FACILITIES

The locations of community facilities and sensitive receptors, including schools, churches, and hospitals are illustrated in the figures in Section 5 relative to the modelled hazardous material release scenario results. The number of sensitive receptors associated with each scenario listed in Table 6.2-1 is included in the right-hand column of the table. As shown, the for the onsite chlorine release scenarios (Scenarios 1.a.1., 1.a.2., and 1.b.2), there are twelve community facilities and sensitive receptors within the zone of influence. For the onsite hydrochloric acid release scenario (Scenario 2.b), there are a total of twenty-six community facilities and sensitive receptors within the zone of influence. For the offsite hydrochloric acid and hypochlorite release scenarios (transportation spills), the number of community facilities and sensitive receptors is dependent to some extent on the location of the event; a transportation spill could occur at any point along the transportation route. For the purposes of this analysis it has been assumed that the transportation spill would occur in the vicinity of population centres and community and sensitive receptors, and the modelled location of the transportation spill events was selected specifically to maximize the number of community facilities and sensitive receptors within the zone of influence. For the offsite hydrochloric acid release scenario (Scenario 6.a), there are forty community facilities and sensitive receptors within the zone of influence; for the offsite hypochlorite release scenario (Scenario 6.b), there are thirty-two community facilities and sensitive receptors within the zone of influence.

7.0 SOCIETAL RISK

71 SOCIETAL RISK GUIDELINES

Table 7.2-1 shows the EMA Societal Risk Guidelines for QRA. Individual risk is estimated for each accident scenario evaluated in Sections 5.2.1 through 5.2.6 based on the modelled impacts and locations of specific receptors. The number of offsite residential individuals within the zone of influence for each scenario is estimated using year 2000 census data and the frequency of wind direction. The number of offsite industrial workers within the zone of influence for each scenario is estimated from the locations and employment data for neighbouring industrial facilities and the frequency of wind direction. The results of the population analysis for each scenario are depicted in Figures 5.2-1a through 5.2-17a.

Table 7.2-1: Societal Risk Guidelines

Number of Affected Persons	Incident Frequency
10	1×10^{-4}
100	1×10^{-6}
1,000	1×10^{-8}
10,000	1×10^{-10}

72 DETERMINATION OF SOCIETAL RISK

Societal risk is estimated for each accident scenario by ranking the scenarios based on risk probability as function of individual risk, with respect to population groups, i.e. the individual risk associated with the accident scenario multiplied by the number of people exposed represent the affected population. The affected population and frequency of occurrence for each accident scenario is evaluated based on the EMA Societal Risk Guidelines (Table 4) and depicted in the form of an F-n diagram.

Table 7.2-2 shows the offsite population exposure summary, including the number of residential individuals and industrial workers within the zone of influence and the total number of individuals within the zone of influence. As shown, based on the frequency and number of individuals within the zone of influence, Scenarios 1.a.1, 1.a.2, 1.a.3, 2.c, 6.a, and 6.b are below EMA Societal Risk Guidelines. The number of individuals within the zone of influence for each scenario, the frequency, and the relationship of these to the EMA Guidelines are illustrated in Figure 7.2-1. Mitigation actions to reduce the frequency or consequences of the various scenarios are discussed in the mitigation section of the EIA.

Table 7.2-2: Offsite Population Exposure Summary

No.	Scenario	Type	Offsite Persons Within Zone of Influence				Scenario Risk	EMA Guide
			Figure	Resident	Industrial	Total		
1	*Onsite hazardous material (gaseous) release*							
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	5.2-1a	23	142	165	2.00×10^{-7}	3.7×10^{-7}
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	5.2-4a	23	142	165	2.00×10^{-7}	1.2×10^{-6}
1.a.3	Chlorine process pipe breach [seismic event]	Cl_2 release	5.2-7a	37	151	188	2.00×10^{-7}	5.5×10^{-7}
1.b	Intermixing of Hypochlorite with HCl	Cl_2 release	5.2-9a 5.2-10a	8	51	59	2.00×10^{-8}	5.2×10^{-6}
2	*Onsite hazardous material (liquid) release*							
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	5.2-12a	60	97	158	2.00×10^{-7}	4.0×10^{-7}
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	5.2-13a	3	15	18	2.00×10^{-7}	3.0×10^{-5}
4	*Flammable gas release (deflagration)*							
4.b	Offsite Natural gas deflagration[a]	CH_4 release	5.2-14a	1	0	1	3.00×10^{-7}	1.0×10^{-4}
6	*Offsite transportation hazardous material release*							
6.a	Hydrochloric acid: 4,000 gallon tank truck accident	HCl spill	5.2-15a 5.2-16a	63	82	145	3.00×10^{-7}	4.73×10^{-7}
6.b	Hypochlorite: 4,000 gallon tank truck accident	bleach spill	5.2-17a	53	62	114	3.00×10^{-7}	7.68×10^{-7}

[a] The zone of influence for this scenario does not extend to the closest residential structure

Figure 7.2-1: F-N Curve: CariSal Facility

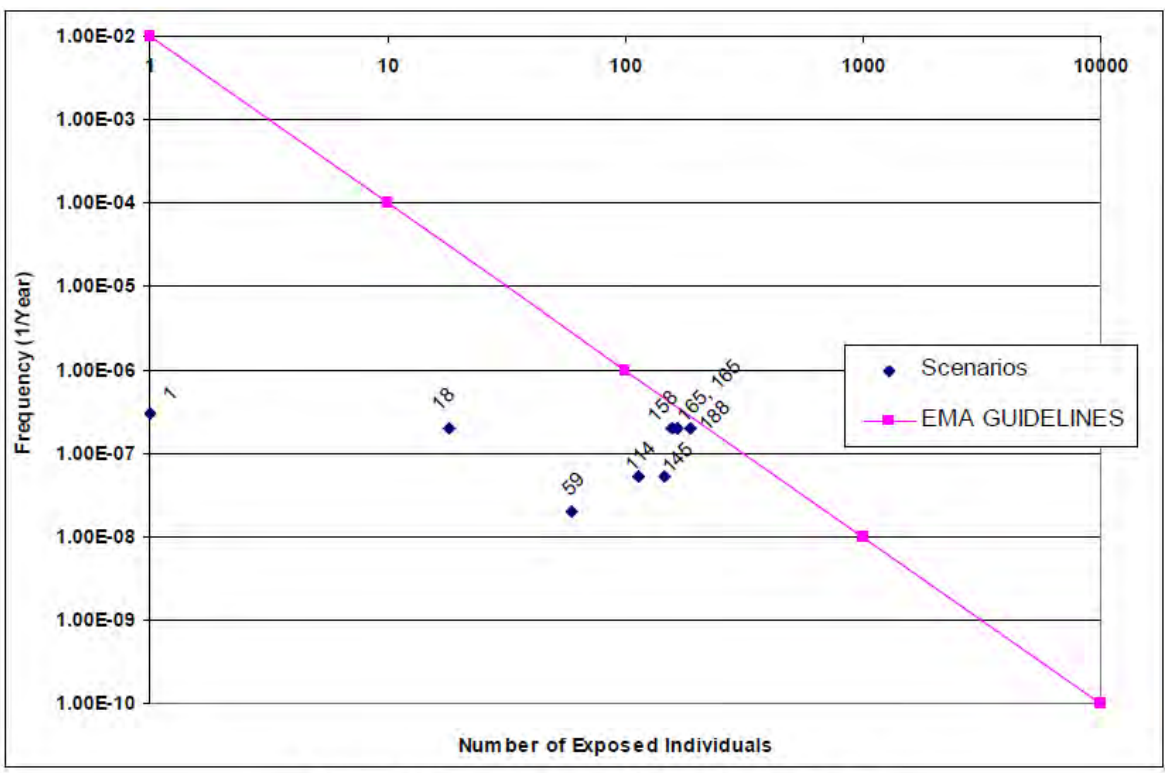


Figure 7.2-1 Fn-Curve: CariSal Facility

8.0 ADDITIONAL ANALYSES

8.1 PLANT EMERGENCY SHUT DOWN SYSTEMS

For the purposes of the risk assessment, storage tank secondary containment systems are assumed to function effectively to contain accidental releases of liquid hazardous materials from onsite storage tanks and the offsite EISL facility caustic storage tank. The chlor-alkali plant emergency shutdown system and automatic shutoff systems for the CariSal plant natural gas system and caustic pipeline are assumed to operate effectively, and the plant nitrogen purge and dry compressed air systems are assumed to function effectively to evacuate hydrogen and chlorine from process lines to the hydrogen stack and bleach plant, respectively, in the event of emergency plant shutdown.

8.2 CONSTRUCTION ACCIDENT SCENARIOS

Construction of the chlor-alkali facility would occur over a 10-month time period. There is the potential for spills of hazardous materials (e.g., solvents) and the potential for fires involving flammable materials (e.g., transportation and construction equipment fuel). The potential for fire scenarios during the construction phase of the project would be limited, as flammable material (e.g., fuel) is not anticipated to be stored onsite during the construction period, and onsite fuelling of construction equipment onsite would be subject to practices and procedures to prevent spills and fires. The potential for hazardous materials release scenarios during the construction phase of the project would be limited, as only limited quantities of hazardous materials are anticipated to be stored onsite at any one time. Any hazardous materials stored on site would be stored within secondary containment systems to prevent any spills from contacting soil. Practices and procedures would be implemented to prevent spills of hazardous materials during the construction phase. No accidental release scenarios involving chlorine, caustic, hydrochloric acid, or hypochlorite are anticipated for the construction phase of the project.

8.3 STARTUP ACCIDENT SCENARIOS

Frequency and consequences of accident scenarios identified in the HAZID would not differ during initial startup or plant restart from normal plant operation. Therefore no additional analyses of accident scenarios for plant startup or plant restart have been conducted for the risk assessment.

8.4 ALTERNATIVE PLANT CONFIGURATION ACCIDENT SCENARIOS

Frequency and consequences of accident scenarios identified in the HAZID would not be affected by alternative plant configurations, for example, onsite reverse osmosis plant, onsite cogeneration plant. Therefore no additional analyses of accident scenarios for alternative plant configurations have been conducted for the risk assessment.

9.0 RISK RANKING

The risk ranking for each scenario is based on the individual risk or probability of exposure, societal risk or number of residents and industrial workers potentially exposed, and the number of community facilities and sensitive receptors within the zone of influence. Based on these factors, the offsite hydrochloric acid release scenario (Scenario 6.a) and the offsite hypochlorite release scenario (Scenario 6.b) are the two highest ranked scenarios. The third- and fourth-highest ranked scenarios are the onsite hydrochloric acid release (Scenario 2.b) and the onsite chlorine release (Scenarios 1.a.1. and 1.a.2). The societal risks for the onsite and offsite release scenarios are within the EMA Societal Risk Guidelines.

10.0 CUMULATIVE IMPACTS

The potential exists for accidents at existing or proposed facilities in the vicinity of the chlor-alkali plant (e.g., Essar, Westlake, Natural Gas Company) to affect chlor-alkali plant operations. A review of accident scenarios for nearby existing and proposed facilities did not identify any scenarios that could precipitate an event (e.g., hazardous materials release) at the chlor-alkali plant). Therefore, no additional analyses of the potential cumulative effects of accident occurrences at existing or proposed facilities have been conducted for the QRA.

11.0 REFERENCES

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ATTACHMENT 1

ALOHA MODELLING RUNS FOR ACCIDENT SCENARIOS

Assumptions:

1. Table 1, "Appendix C: Risk Assessment," provided the release height, release temperature, release duration, total release and release rate
2. Scenarios provided from "Appendix C: Risk Assessment."
3. Wet Season
    a. Used consistent date of August 1, 2007 at 1200.
    b. Used temperature of 28.3 °C
    c. Used 80% cloud coverage
    d. Used 80% humidity
    e. Used wind direction from 270°
    f. Used F stability class with wind speed of 1.5 m/sec
4. Dry Season
    a. Used consistent date of February 1, 2007 at 1200.
    b. Used temperature of 26.6 °C
    c. Used 30% cloud coverage
    d. Used 75% humidity
    e. Used wind direction from 270°
    f. Used F stability class with wind speed of 1.5 m/sec
5. Modelling hydrogen chloride

    Hydrogen chloride can react with water and/or water vapour. This can affect the downwind dispersions. ALOHA cannot accurately predict the air hazard is the substance comes into contact with water. Therefore, hydrogen chloride is modelled assuming that no reaction occurs.

6. Modelling sodium hypochlorite release as chlorine monoxide dense gas release

    The Aloha computer database does not contain sodium hypochlorite. The program does not model mixtures. There is uncertainty about the species existing in the vapour above a solution of sodium hypochlorite, and both hypochlorous acid and chlorine monoxide are believed to be present. Therefore, for the scenarios modelling sodium hypochlorite, the modelling assumes devolution of chlorine monoxide gas from the sodium hypochlorite solution. The chlorine monoxide is modelled as a dense gas release. No IDLH data were identified for chlorine monoxide or hypochlorous acid. Thus, hydrochloric acid, a compound that is supported by the ALOHA model, was used as a surrogate for the IDLH for both chlorine monoxide and hypochlorous acid.

References:

1. "Appendix C: Risk Assessment; Proposed CariSal Trinidad Limited Chlor-Alkali Facility and Associated Infrastructure, Point Lisas, Trinidad and Tobago, West Indies," Draft, ICF International and DaCosta Gwendoline, Ltd., November 1, 2007.
2. Carr, Ed to Lanza, Robert, email, *RE: Meteorological Data for Accidental Release Modelling,* ICF International, October 30, 2007.
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1.a.1 Chlorine Indoor Release Scenario (Wet Season): Chlorine IDLH threshold concentration

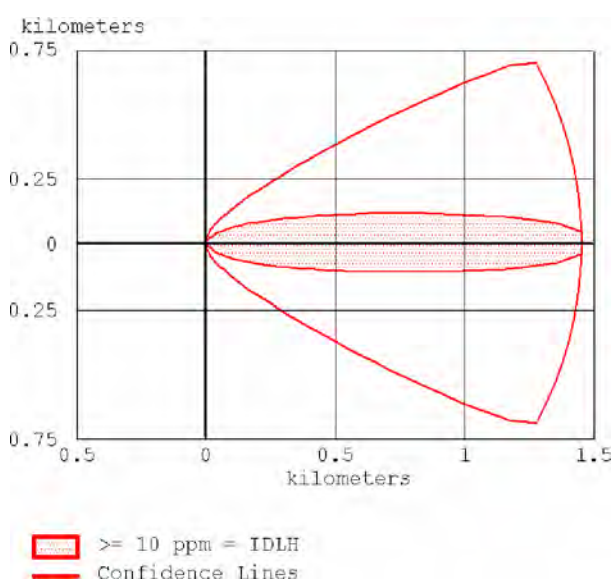
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 0.42 (unsheltered) single storied
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 1 meter
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.5 kilometres --- (10 ppm = IDLH)



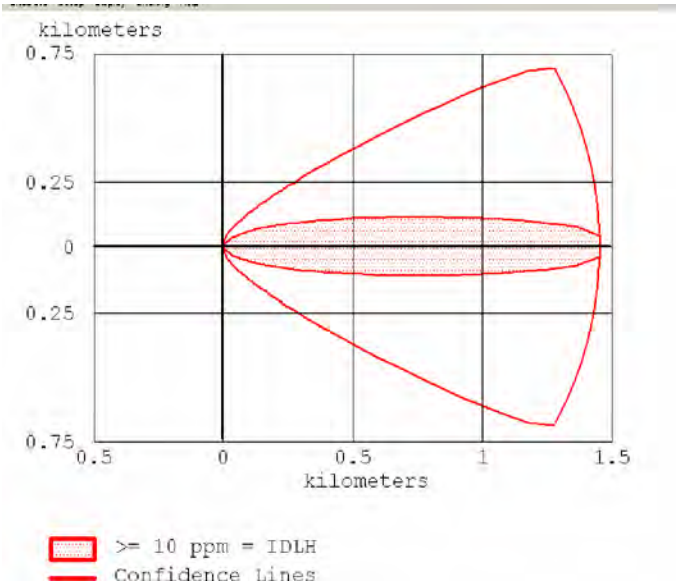
1.a.1 Chlorine Indoor Release Scenario (Dry Season): Chlorine IDLH threshold concentration

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 0.40 (unsheltered) single storied
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 1 meter
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.



1.a.1 Chlorine Indoor Release Scenario (Wet Season): 300 mg/m³, 200 mg/m³, and 100 mg/m³ threshold concentrations

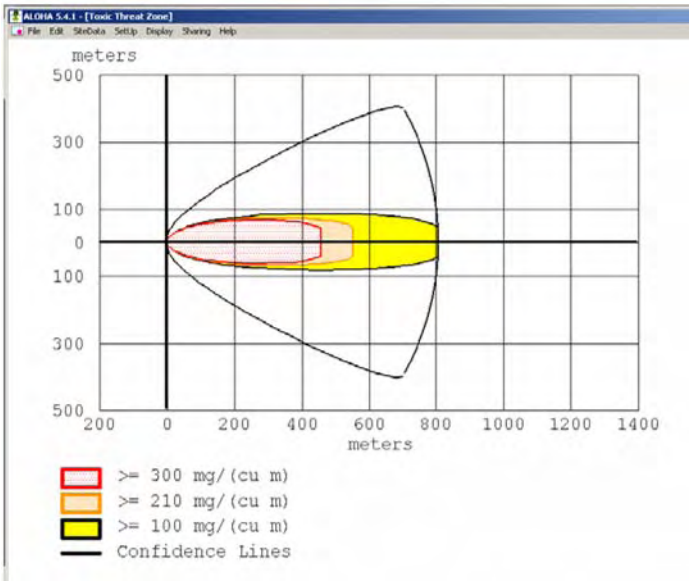
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 0.42 (unsheltered) single storied
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Ambient Boiling Point: -34.0° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 1 meter
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 457 meters --- (300 mg/m³)
Orange: 553 meters --- (210 mg/m³)
Yellow: 806 meters --- (100 mg/m³)



1.a.1 Chlorine Indoor Release Scenario (Dry Season): 300 mg/m³, 200 mg/m³, and 100 mg/m³ threshold concentrations

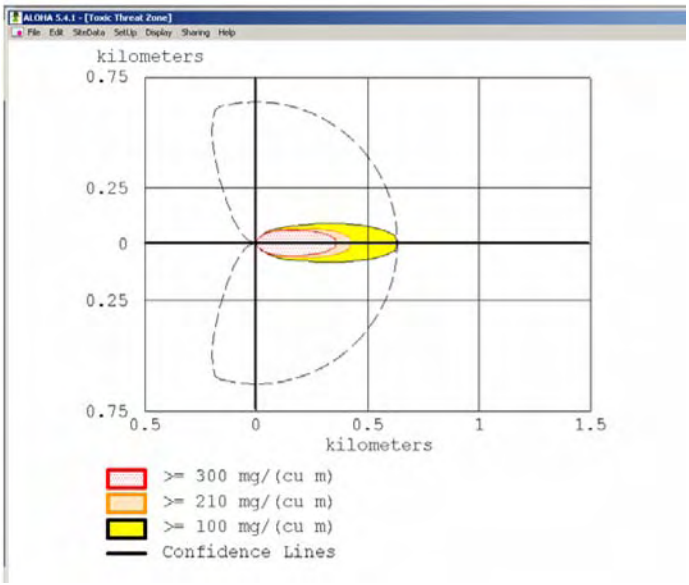
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 0.41 (unsheltered) single storied
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Ambient Boiling Point: -34.0° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C Stability Class: B
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 1 meter
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 360 meters --- (300 mg/m³)
Orange: 435 meters --- (210 mg/m³)
Yellow: 638 meters --- (100 mg/m³)



1.a.2 Chlorine Outdoor Release Scenario (Wet Season): Chlorine IDLH threshold concentration

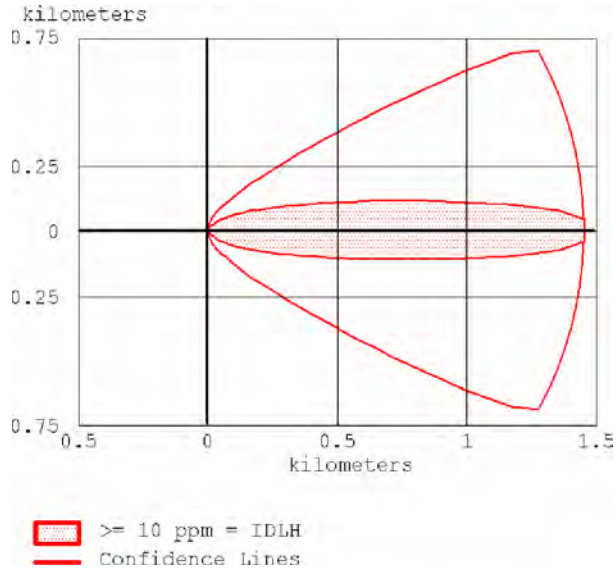
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.5 kilometres --- (10 ppm = IDLH)



1.a.2 Chlorine Outdoor Release Scenario (Dry Season): Chlorine IDLH threshold concentration

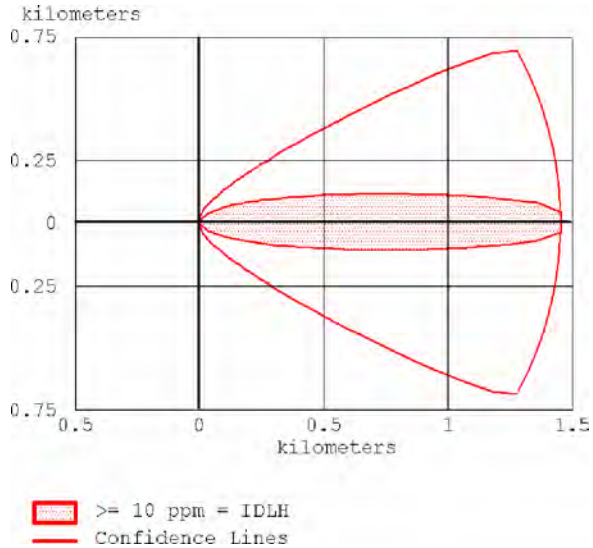
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.5 kilometres --- (10 ppm = IDLH)



1.a.2 Chlorine Outdoor Release Scenario (Wet Season): 300 mg/m³, 200 mg/m³, and 100 mg/m³ threshold concentrations

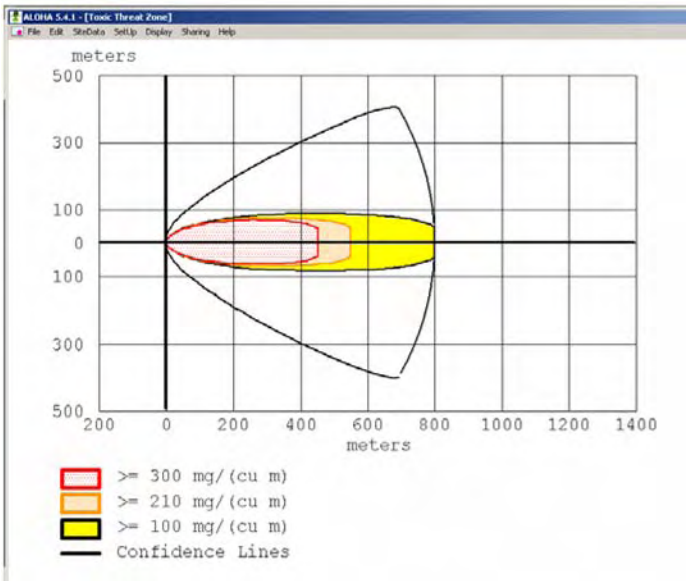
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Ambient Boiling Point: -34.0° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180' true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 40' C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 454 meters --- (300 mg/m³)
Orange: 550 meters --- (210 mg/m³)
Yellow: 799 meters --- (100 mg/m³)



1.a.2 Chlorine Outdoor Release Scenario (Dry Season): 300 mg/m³, 200 mg/m³, and 100 mg/m³ threshold concentrations

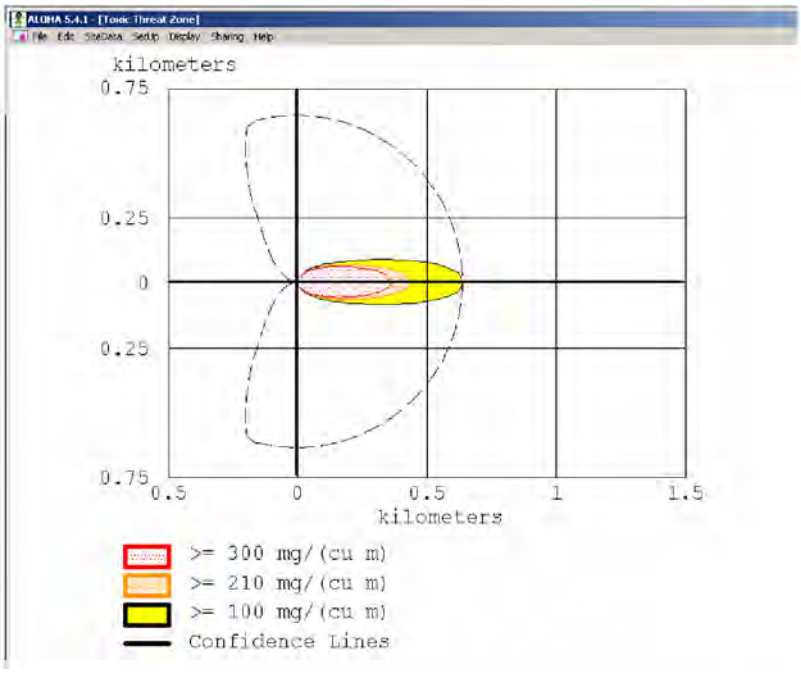
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Ambient Boiling Point: -34.0° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 40° C Stability Class: B
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 43.1 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 43.1 kilograms/min
Total Amount Released: 129 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 365 meters --- (300 mg/m³)
Orange: 440 meters --- (210 mg/m³)
Yellow: 643 meters --- (100 mg/m³)



1.a.3 Seismic Event (Wet Season)

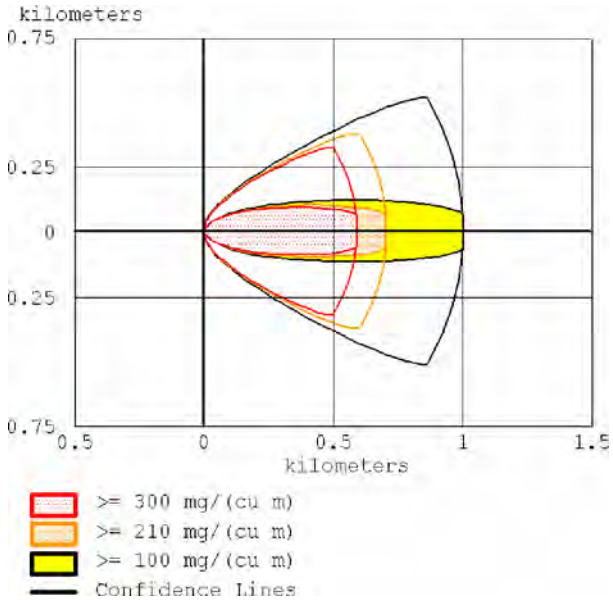
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: .08667 tons/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 78.6 kilograms/min
Total Amount Released: 236 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 593 meters --- (300 mg/m³)
Orange: 707 meters --- (210 mg/m³)
Yellow: 1.0 kilometre --- (100 mg/m³)



1.a.3 Seismic Event (Dry Season)

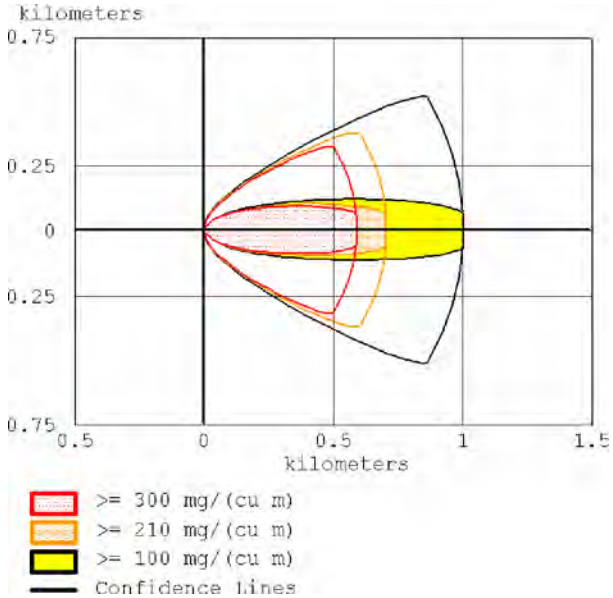
SITE DATA:
Location: TRINIDAD, TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
AEGL-1(60 min: 0.5 ppm) AEGL-2(60 min: 2 ppm) AEGL-3(60 min: 20 ppm)
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 26.6° C
Stability Class: F (user override
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: .08667 tons/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 78.6 kilograms/min
Total Amount Released: 236 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 593 meters --- (300 mg/m³
Orange: 707 meters --- (210 mg/m³)
Yellow: 1.0 kilometre --- (100 mg/m³)



1.a.3 Seismic Event (Wet Season): Chlorine IDLH threshold concentration

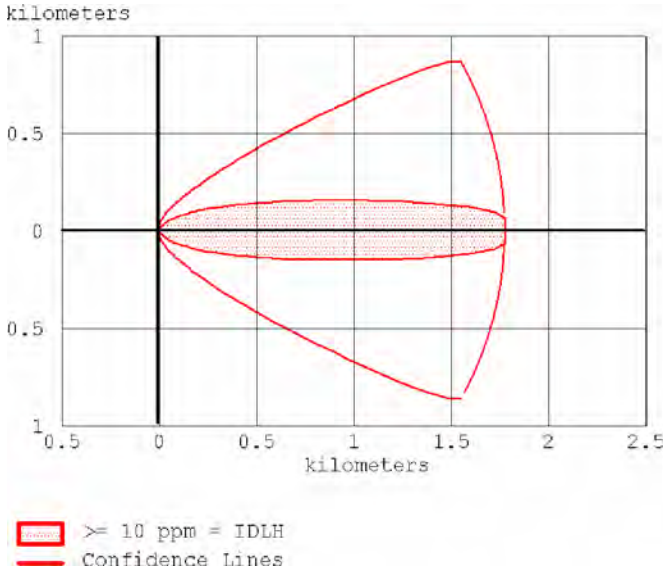
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 78.6 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 78.6 kilograms/min
Total Amount Released: 236 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.8 kilometres --- (10 ppm = IDLH)



1.a.3 Seismic Event (Dry Season): Chlorine IDLH threshold concentration

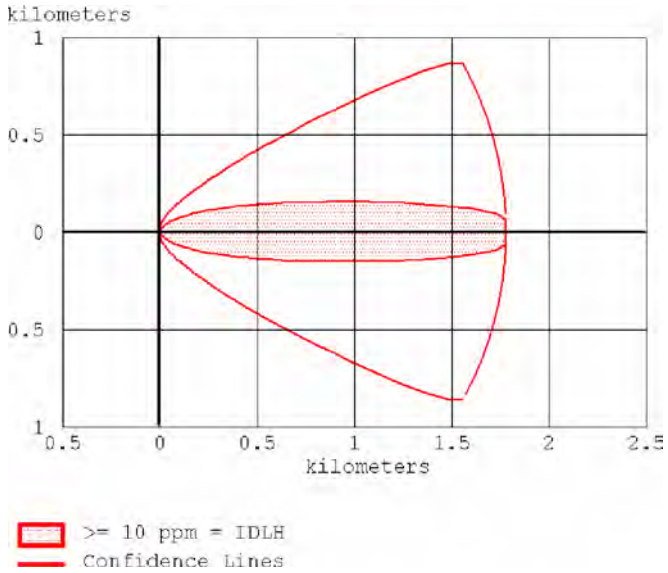
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 78.6 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 78.6 kilograms/min
Total Amount Released: 236 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.8 kilometres --- (10 ppm = IDLH)



1.b Intermixing of Hypochlorite with HCl – Chlorine Release (Wet Season): Chlorine IDLH threshold concentration

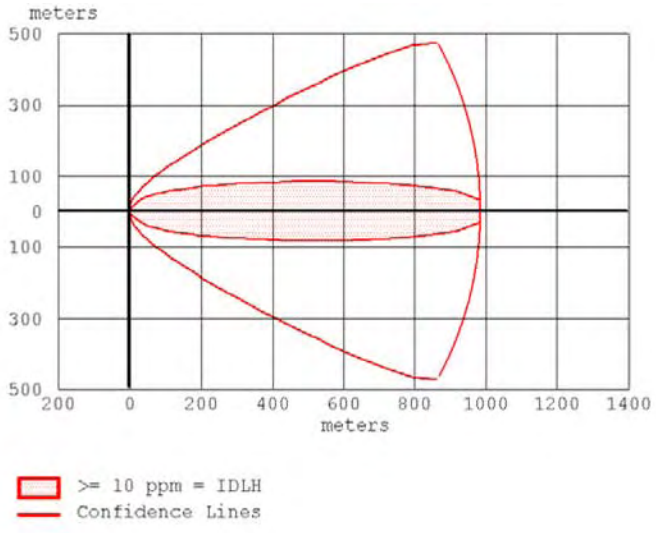
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified
Time: August 1, 2007 1200 hours ST (user specified

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Evaporating Puddle
Puddle Area: 4 square meters Puddle Mass: 54.3 kilograms
Ground Type: Concrete Ground Temperature: 28.3° C
Initial Puddle Temperature: -34° C
Release Duration: 3 minutes
Max Average Sustained Release Rate: 28.9 kilograms/min
(averaged over a minute or more
Total Amount Released: 54.3 kilograms

THREAT ZONE:
Model Run: Heavy Gas
Red : 987 meters --- (10 ppm = IDLH)



1.b Intermixing of Hypochlorite with HCl – Chlorine Release (Dry Season): Chlorine IDLH threshold concentration

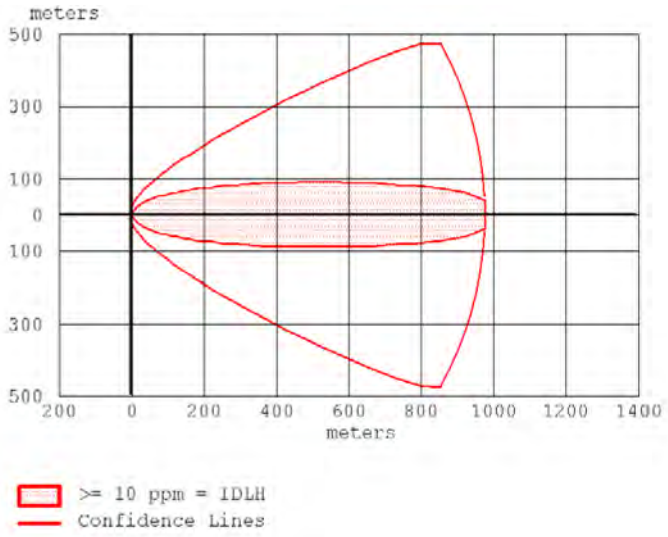
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
IDLH: 10 ppm
Carcinogenic risk - see CAMEO Ambient Boiling Point: -34.0° C Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Evaporating Puddle
Puddle Area: 5 square meters Puddle Mass: 54.3 kilograms
Ground Type: Concrete Ground Temperature: 26.6° C
Initial Puddle Temperature: -34° C
Release Duration: 3 minutes
Max Average Sustained Release Rate: 35.1 kilograms/min
(averaged over a minute or more)
Total Amount Released: 54.3 kilograms

THREAT ZONE:
Model Run: Heavy Gas
Red : 977 meters --- (10 ppm = IDLH)



1.b Intermixing of Hypochlorite with HCl – Chlorine Release (Wet Season): 300 mg/m³, 200 mg/m³, and 100 mg/m³ threshold concentrations

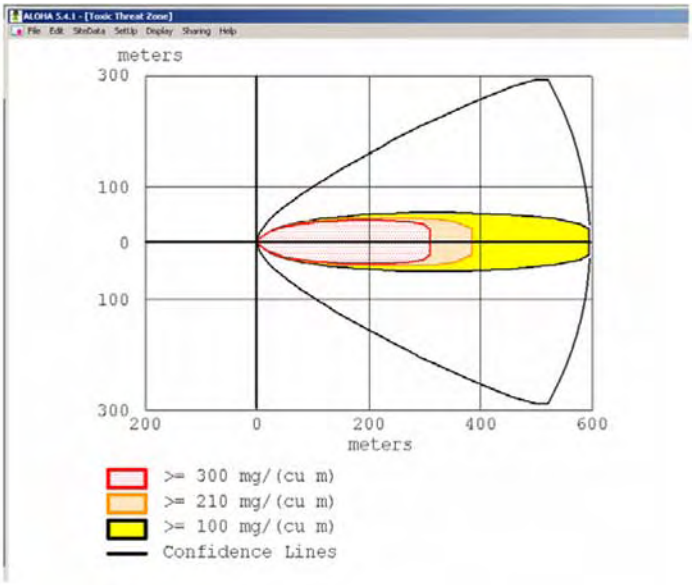
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Ambient Boiling Point: -34.0° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 18.1 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 18.1 kilograms/min
Total Amount Released: 54.3 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 311 meters --- (300 mg/m³)
Orange: 387 meters --- (210 mg/m³)
Yellow: 596 meters --- (100 mg/m³)



1.b Intermixing of Hypochlorite with HCl – Chlorine Release (Dry Season: 300 mg/m³, 200 mg/m³, and 100 mg/m³ threshold concentrations

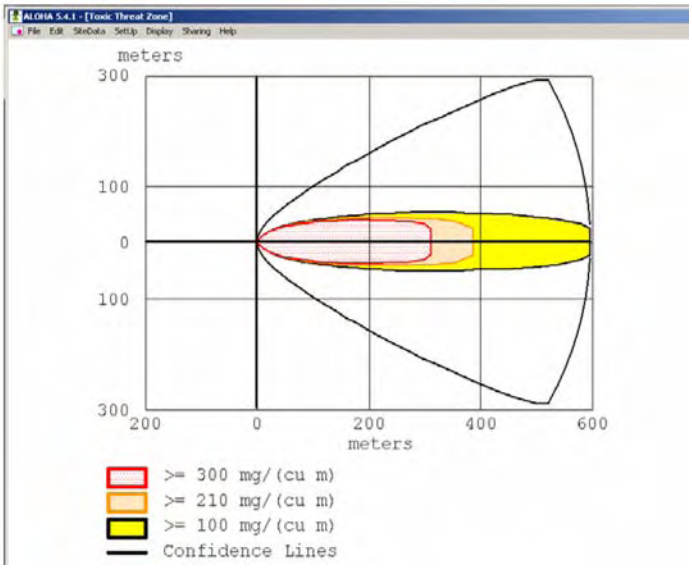
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
Ambient Boiling Point: -34.0° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 18.1 kilograms/min Source Height: 4 meters
Release Duration: 3 minutes
Release Rate: 18.1 kilograms/min
Total Amount Released: 54.3 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Heavy Gas
Red : 312 meters --- (300 mg/m³)
Orange: 388 meters --- (210 mg/m³)
Yellow: 597 meters --- (100 mg/m³)



2a Vessel Failure: On-site NaOH Storage Tank Spill (Wet Season)

According to EPA guidance on accidental release modelling, toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 millimetres of mercury (mm Hg).[6] The vapour pressure of 50% sodium hydroxide solution at ambient temperature (20 degrees C) is approximately 1.5 mm Hg and is approximately 6 mm Hg at a temperature of 40 degrees C.[7] Therefore liquid spills of NaOH solution have not been modelled in this risk assessment.

[6] RMP Series: Risk Management Program Guidance for Offsite Consequence Analysis, United States Environmental Protection Agency Office of Solid Waste and Emergency Response (5104) Chemical Emergency Preparedness and Prevention Office, EPA 550-B-99-009, April 1999, Section 3.2.4, Page 3-11.

[7] http://msds.fmc.com/msds/100000010035-msds_us-e.pdf; http://www.dow.com/causticsoda/phys/index.htm

2a Vessel Failure: On-site NaOH Storage Tank Spill (Dry Season)

According to EPA guidance on accidental release modelling, toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 mm Hg.[8] The vapour pressure of 50% sodium hydroxide solution at ambient temperature (20 degrees C is approximately 1.5 mm Hg and is approximately 6 mm Hg at a temperature of 40 degrees C.[9] Therefore liquid spills of NaOH solution have not been modelled in this risk assessment.

[8] RMP Series: Risk Management Program Guidance for Offsite Consequence Analysis, United States Environmental Protection Agency Office of Solid Waste and Emergency Response (5104) Chemical Emergency Preparedness and Prevention Office, EPA 550-B-99-009, April 1999, Section 3.2.4, Page 3-11.

[9] http://msds.fmc.com/msds/100000010035-msds_us-e.pdf; http://www.dow.com/causticsoda/phys/index.htm

2b Vessel Failure: On-site HCl Storage Tank Spill (Wet Season)

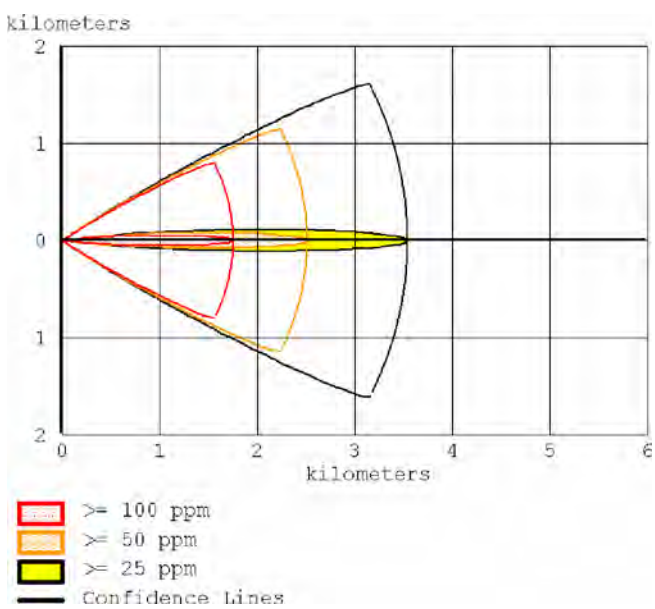
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROCHLORIC ACID Molecular Weight: 36.46 g/mol
Ambient Boiling Point: -85.1 ° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 53 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 53 kilograms/min
Total Amount Released: 530 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 1.8 kilometres --- (100 ppm)
Orange: 2.5 kilometres --- (50 ppm)
Yellow: 3.5 kilometres --- (25 ppm)



2b Vessel Failure: On-site HCl Storage Tank Spill (Dry Season)

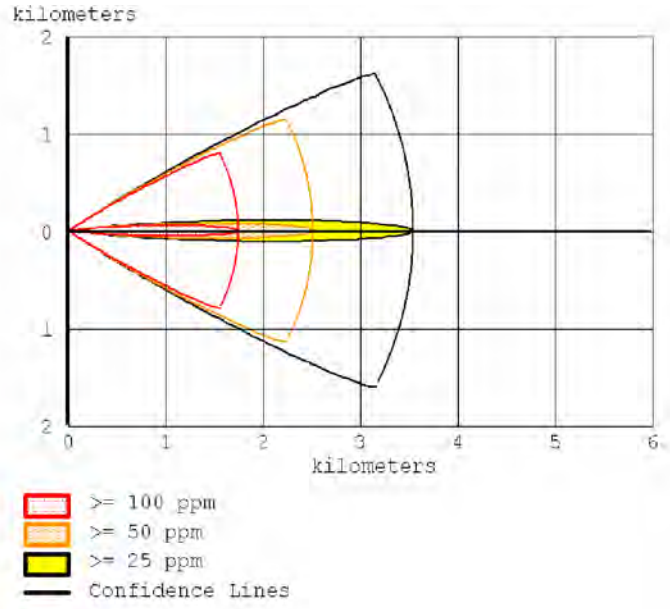
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROCHLORIC ACID Molecular Weight: 36.46 g/mol
Ambient Boiling Point: -85.1 ° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 53 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 53 kilograms/min
Total Amount Released: 530 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 1.8 kilometres --- (100 ppm)
Orange: 2.5 kilometres --- (50 ppm)
Yellow: 3.5 kilometres --- (25 ppm)



2c Vessel Failure – On-site Sodium Hypochlorite Storage Tank Spill (Wet Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE MONOXIDE Molecular Weight: 86.90 g/mol
Ambient Boiling Point: 2.2° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 13.2 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 13.2 kilograms/min
Total Amount Released: 132 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 491 meters --- (100 ppm)
Orange: 721 meters --- (50 ppm)
Yellow: 1.1 kilometres --- (25 ppm)

2c Vessel Failure – On-site Sodium Hypochlorite Storage Tank Spill (Dry Season)

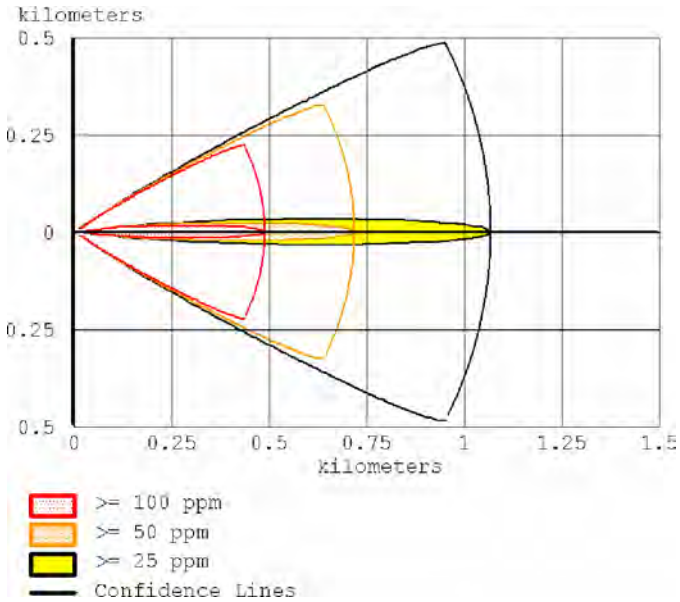
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE MONOXIDE Molecular Weight: 86.90 g/mol
Ambient Boiling Point: 2.2° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 13.2 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 13.2 kilograms/min
Total Amount Released: 132 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 490 meters --- (100 ppm)
Orange: 719 meters --- (50 ppm)
Yellow: 1.1 kilometres --- (25 ppm)



3.a.1 Hydrogen Process Pipe Breach Indoors (Wet Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 0.40 (unsheltered) single storied
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 0.001333 cubic meters/min
Source Height: 0
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: equal to ambient
Release Duration: 3 minutes
Release Rate: 0.109 grams/min
Total Amount Released: 0.33 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- 24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.
Yellow: less than 10 meters (10.9 yards --- 4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

3.a.1 Hydrogen Process Pipe Breach Indoors (Dry Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 0.40 (unsheltered) single storied
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 0.001333 cubic meters/min
Source Height: 1 meter
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: equal to ambient
Release Duration: 3 minutes
Release Rate: 0.109 grams/min
Total Amount Released: 0.33 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

3.a.2 Hydrogen Process Pipe Breach Outdoors (Wet Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)
CHEMICAL DATA:

Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8' C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180' true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 0.001333 cubic meters/min
Source Height: 4 meters
Source State: Gas
Source Temperature: 87' C
Source Pressure: 18.18 psia
Release Duration: 3 minutes
Release Rate: 0.112 grams/min
Total Amount Released: 0.34 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because the ground level concentrations never exceed the LOC.

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

3.a.2 Hydrogen Process Pipe Breach Outdoors (Dry Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 0.001333 cubic meters/min
Source Height: 4 meters
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: 18.18 psia
Release Duration: 3 minutes
Release Rate: 0.135 grams/min
Total Amount Released: 0.41 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because the ground level concentrations never exceed the LOC.

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

3.a.3 Hydrogen Process Pipe Breach (Outdoors), Seismic event (Wet Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8' C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180' true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: .002667 cubic meters/min
Source Height: 4 meters
Source State: Gas
Source Temperature: 87' C
Source Pressure: equal to ambient
Release Duration: 3 minutes
Release Rate: 0.182 grams/min
Total Amount Released: 0.55 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (40000 ppm = LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Orange: LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

THREAT ZONE:

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

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3.a.3 Hydrogen Process Pipe Breach (Outdoors), Seismic event (Dry Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8' C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180' true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: .002667 cubic meters/min
Source Height: 4 meters
Source State: Gas
Source Temperature: 87' C
Source Pressure: equal to ambient
Release Duration: 3 minutes
Release Rate: 0.182 grams/min
Total Amount Released: 0.55 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (40000 ppm = LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Orange: LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

THREAT ZONE:

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

3.b Hydrogen Stack Release (Wet Season)

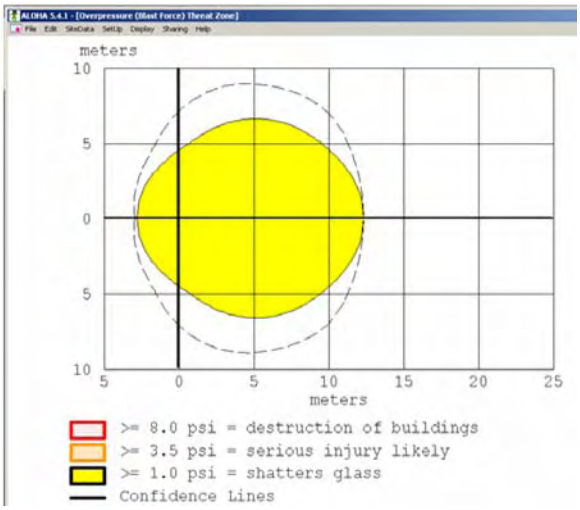
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 0.5 cubic meters/min Source Height: 10 meters
Source State: Gas
Source Temperature: 87° C
Source Pressure: equal to ambient
Release Duration: 30 minutes
Release Rate: 34.1 grams/min
Total Amount Released: 1.02 kilograms
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

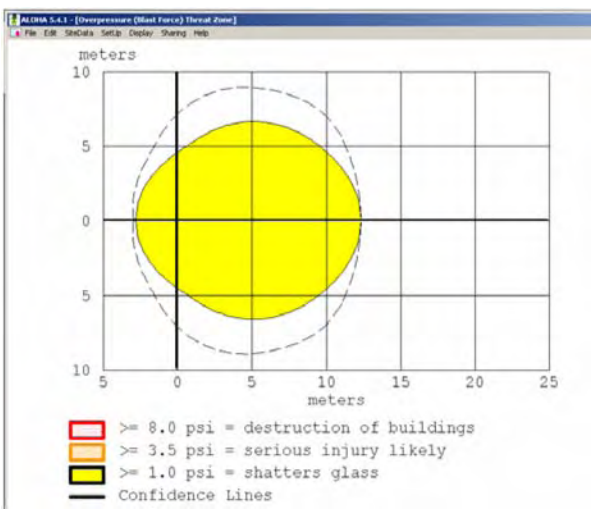
THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (40000 ppm = LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Orange: LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- 8.0 psi = destruction of buildings)
Orange: less than 10 meters (10.9 yards --- 3.5 psi = serious injury likely)
Yellow: 12 meters --- (1.0 psi = shatters glass)



THREAT ZONE:

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- 8.0 psi = destruction of buildings)
Orange: less than 10 meters (10.9 yards --- 3.5 psi = serious injury likely)
Yellow: 12 meters --- (1.0 psi = shatters glass)



3.b Hydrogen Stack Release (Dry Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

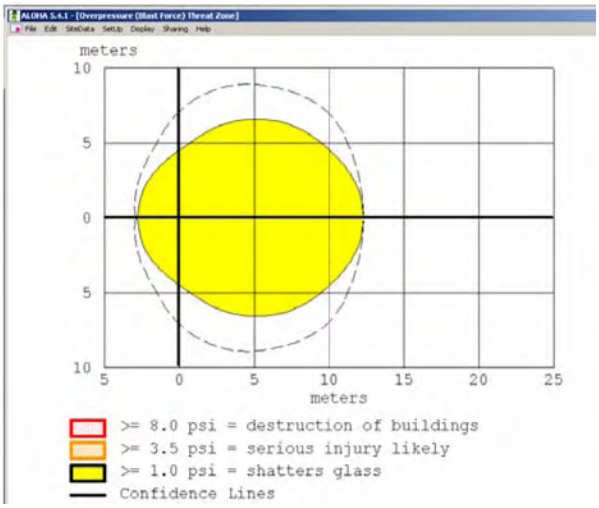
CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 0.5 cubic meters/min Source Height: 10 meters
Source State: Gas
Source Temperature: 87° C
Source Pressure: equal to ambient
Release Duration: 30 minutes
Release Rate: 34.1 grams/min
Total Amount Released: 1.02 kilograms
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

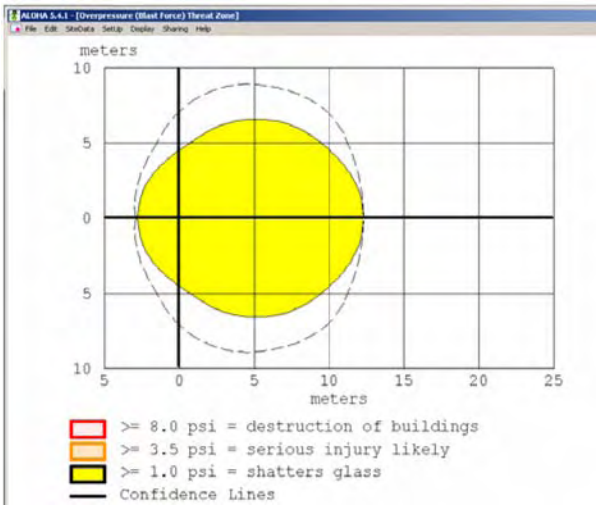
THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (40000 ppm = LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Orange: LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- 8.0 psi = destruction of buildings
Orange: less than 10 meters (10.9 yards --- 3.5 psi = serious injury likely)
Yellow: 12 meters --- (1.0 psi = shatters glass)



THREAT ZONE:

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- (8.0 psi = destruction of buildings)
Orange: less than 10 meters (10.9 yards --- (3.5 psi = serious injury likely)
Yellow: 12 meters --- (1.0 psi = shatters glass)



3.b. HCL Scrubber Outlet (Wet Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

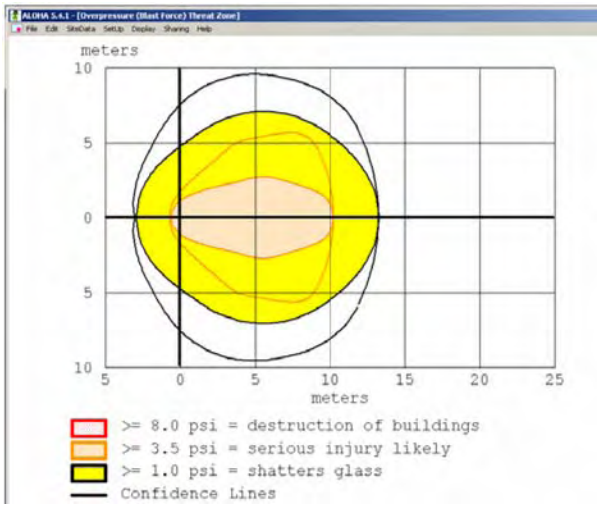
CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 0.5 cubic meters/min Source Height: 29 meters
Source State: Gas
Source Temperature: 40° C
Source Pressure: equal to ambient
Release Duration: 30 minutes
Release Rate: 39.2 grams/min
Total Amount Released: 1.18 kilograms
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

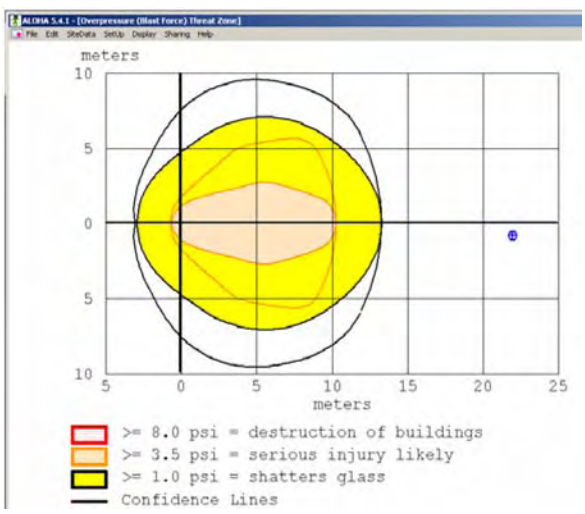
THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (40000 ppm = LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Orange: LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- (8.0 psi = destruction of buildings)
Orange: 10 meters --- (3.5 psi = serious injury likely)
Yellow: 13 meters --- (1.0 psi = shatters glass)



THREAT ZONE:

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- (8.0 psi = destruction of buildings)
Orange: 10 meters --- (3.5 psi = serious injury likely)
Yellow: 13 meters --- (1.0 psi = shatters glass)



3.b. HCL Scrubber Outlet (Dry Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

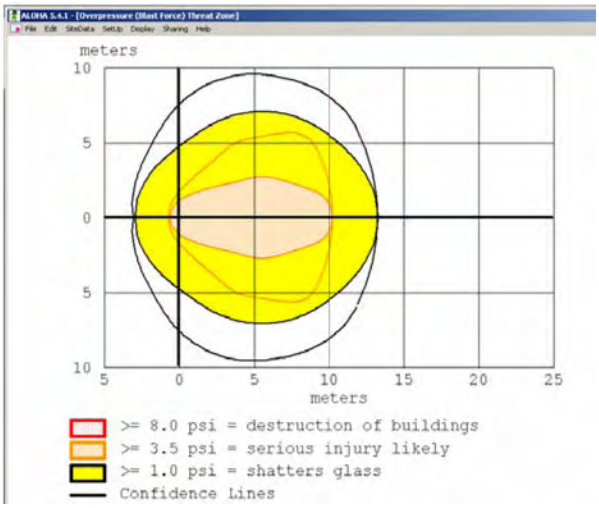
CHEMICAL DATA:
Chemical Name: HYDROGEN Molecular Weight: 2.02 g/mol
LEL: 40000 ppm UEL: 750000 ppm
Ambient Boiling Point: -252.8° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 0.5 cubic meters/min Source Height: 29 meters
Source State: Gas
Source Temperature: 40° C
Source Pressure: equal to ambient
Release Duration: 30 minutes
Release Rate: 39.2 grams/min
Total Amount Released: 1.18 kilograms
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

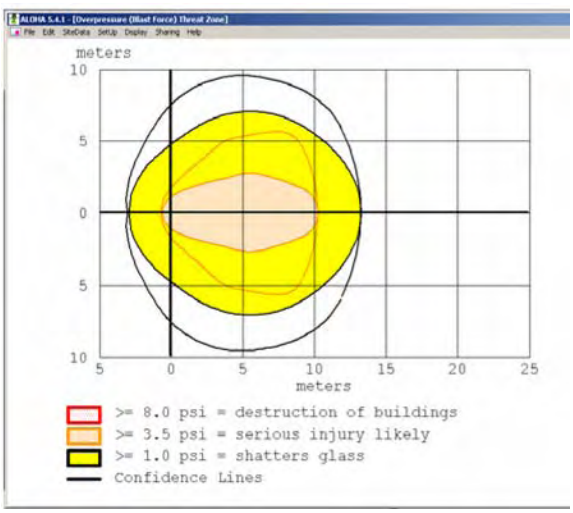
THREAT ZONE:
Threat Modelled: Flammable Area of Vapour Cloud
Model Run: Gaussian
Red : LOC is not exceeded --- (40000 ppm = LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Orange: LOC is not exceeded --- (24,000 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.
Yellow: LOC is not exceeded --- (4,000 ppm = 10% LEL)
Note: Threat zone was not drawn because
the ground level concentrations never exceed the LOC.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by spark or flame
Level of Congestion: congested
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- (8.0 psi = destruction of buildings)
Orange: 10 meters --- (3.5 psi = serious injury likely)
Yellow: 13 meters --- (1.0 psi = shatters glass)



THREAT ZONE:

Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
Red : less than 10 meters (10.9 yards --- (8.0 psi = destruction of buildings)
Orange: 10 meters --- (3.5 psi = serious injury likely)
Yellow: 13 meters --- (1.0 psi = shatters glass)



4a On-site Natural Gas Deflagration (Wet Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: METHANE Molecular Weight: 16.04 g/mol
LEL: 44000 ppm UEL: 165000 ppm
Ambient Boiling Point: -161.5° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 0.222 cubic meters Source Height: 1 meter
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: 15.7 psia
Release Duration: 1 minute
Release Rate: 2.57 grams/sec
Total Amount Released: 154 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

4a On-site Natural Gas Deflagration (Dry Season)

SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: METHANE Molecular Weight: 16.04 g/mol
TEEL-1: 3000 ppm TEEL-2: 5000 ppm TEEL-3: 25000 ppm
LEL: 44000 ppm UEL: 165000 ppm
Ambient Boiling Point: -161.5' C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180' true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 0.222 cubic meters Source Height: 1 meter
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: 15.7 psia
Release Duration: 1 minute
Release Rate: 2.58 grams/sec
Total Amount Released: 155 grams
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
No explosion: no part of the cloud is above the LEL at any time

4b Off-site Natural Gas Deflagration (Wet Season)

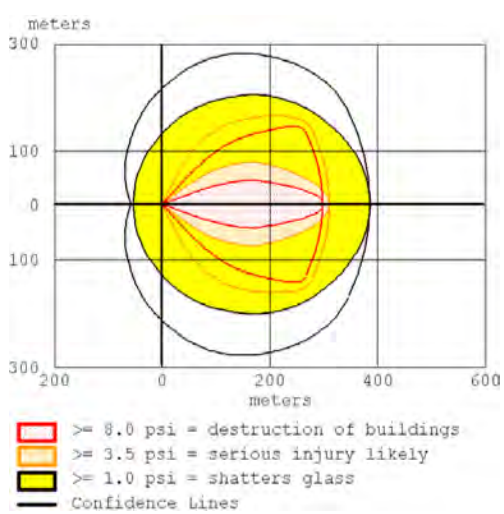
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: METHANE Molecular Weight: 16.04 g/mol
LEL: 44000 ppm UEL: 165000 ppm
Ambient Boiling Point: -161.5° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 16.6 cubic meters Source Height: 0
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: 365 psia
Release Duration: 1 minute
Release Rate: 4.65 kilograms/sec
Total Amount Released: 279 kilograms
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
Red : 299 meters --- (8.0 psi = destruction of buildings)
Orange: 311 meters --- (3.5 psi = serious injury likely)
Yellow: 387 meters --- (1.0 psi = shatters glass)



4b Off-site Natural Gas Deflagration (Dry Season)

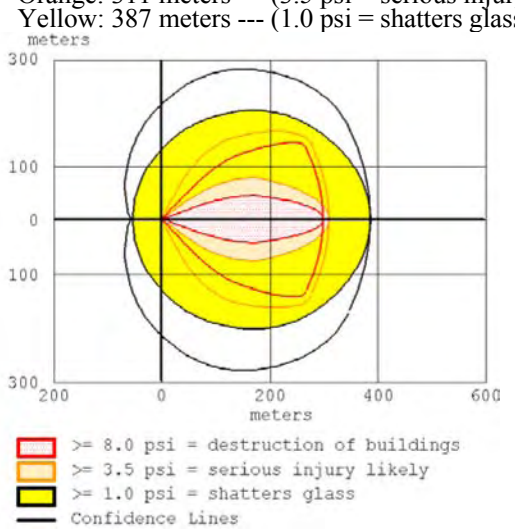
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: METHANE Molecular Weight: 16.04 g/mol
LEL: 44000 ppm UEL: 165000 ppm
Ambient Boiling Point: -161.5' C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180' true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 16.6 cubic meters Source Height: 0
Source State: Gas
Source Temperature: equal to ambient
Source Pressure: 365 psia
Release Duration: 1 minute
Release Rate: 4.69 kilograms/sec
Total Amount Released: 281 kilograms
Note: This chemical may flash boil and/or result in two phase flow.
Use both dispersion modules to investigate its potential behaviour.

THREAT ZONE:
Threat Modelled: Overpressure (blast force from vapour cloud explosion)
Type of Ignition: ignited by detonation
Model Run: Gaussian
Red : 299 meters --- (8.0 psi = destruction of buildings)
Orange: 311 meters --- (3.5 psi = serious injury likely)
Yellow: 387 meters --- (1.0 psi = shatters glass)



6.a Hydrochloric Acid (product) Tank Truck Accident (Wet Season)

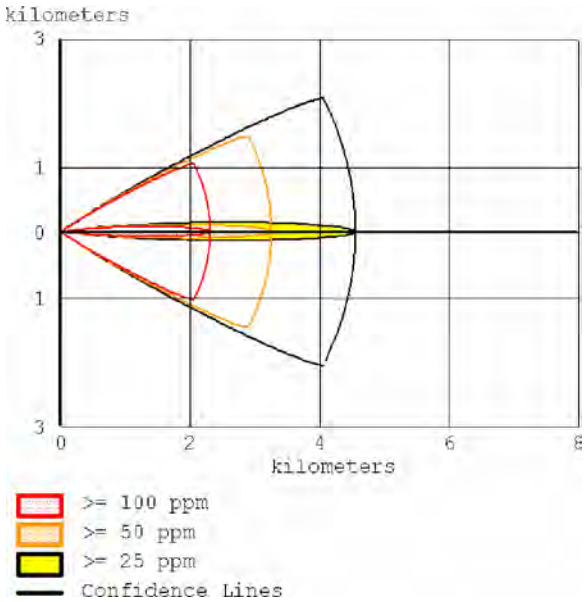
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROCHLORIC ACID Molecular Weight: 36.46 g/mol
Ambient Boiling Point: -85.1 ° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 89 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 89 kilograms/min
Total Amount Released: 890 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 2.3 kilometres --- (100 ppm)
Orange: 3.3 kilometres --- (50 ppm)
Yellow: 4.6 kilometres --- (25 ppm)



6.a Hydrochloric Acid (product) Tank Truck Accident (Dry Season)

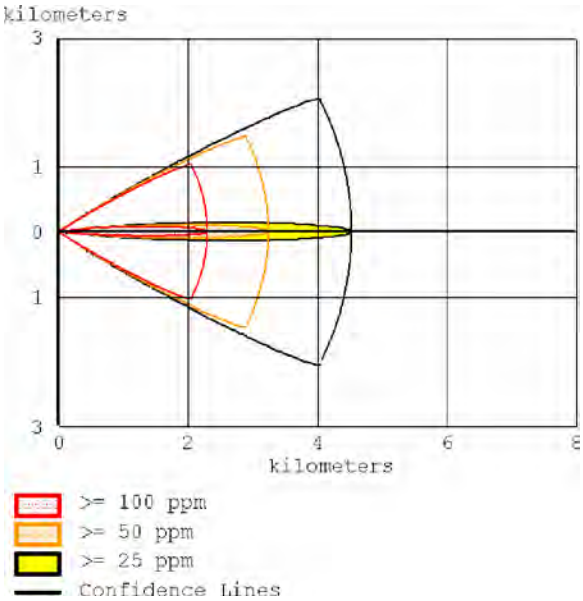
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: HYDROCHLORIC ACID Molecular Weight: 36.46 g/mol
Ambient Boiling Point: -85.1 ° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 89 kilograms/min Source Height: 1 foot
Release Duration: 10 minutes
Release Rate: 89 kilograms/min
Total Amount Released: 890 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 2.3 kilometres --- (100 ppm)
Orange: 3.2 kilometres --- (50 ppm)
Yellow: 4.5 kilometres --- (25 ppm)



6.b Hypochlorite (bleach product) Tank Truck Accident (Wet Season)

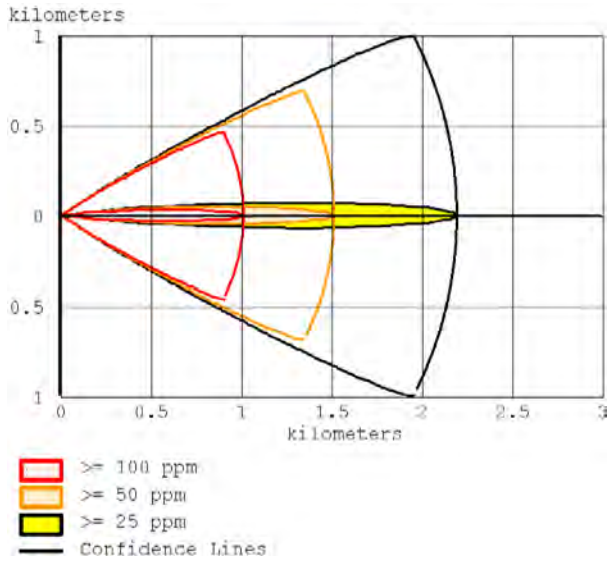
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: August 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE MONOXIDE Molecular Weight: 86.90 g/mol
Ambient Boiling Point: 2.2° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 190° true at 3 meters
Ground Roughness: open country Cloud Cover: 8 tenths
Air Temperature: 28.3° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 80%

SOURCE STRENGTH:
Direct Source: 48 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 48 kilograms/min
Total Amount Released: 480 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 1.0 kilometre --- (100 ppm)
Orange: 1.5 kilometres --- (50 ppm)
Yellow: 2.2 kilometres --- (25 ppm)



6.b Hypochlorite (bleach product) Tank Truck Accident (Dry Season)

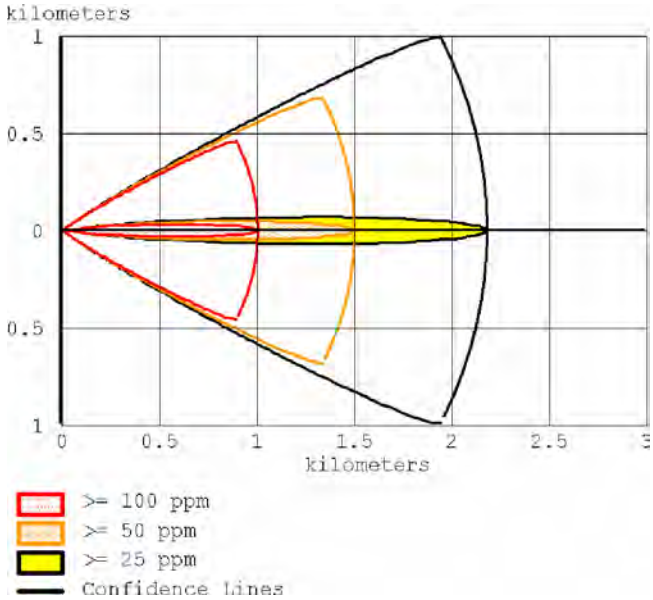
SITE DATA:
Location: TRINIDAD
Building Air Exchanges Per Hour: 60 (user specified)
Time: February 1, 2007 1200 hours ST (user specified)

CHEMICAL DATA:
Chemical Name: CHLORINE MONOXIDE Molecular Weight: 86.90 g/mol
Ambient Boiling Point: 2.2° C
Vapour Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%
Note: Not enough chemical data to use Heavy Gas option

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 1.5 meters/second from 180° true at 3 meters
Ground Roughness: open country Cloud Cover: 3 tenths
Air Temperature: 26.6° C
Stability Class: F (user override)
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Direct Source: 48 kilograms/min Source Height: 1 meter
Release Duration: 10 minutes
Release Rate: 48 kilograms/min
Total Amount Released: 480 kilograms
Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
Model Run: Gaussian
Red : 1.0 kilometre --- (100 ppm)
Orange: 1.5 kilometres --- (50 ppm)
Yellow: 2.2 kilometres --- (25 ppm)



ATTACHMENT 2
MATERIAL SAFETY DATA SHEETS

NOVA Chemicals®

Material Safety Data Sheet

Material Name: **Brine Solution** **MSDS ID: NOVA-0087**

Section 1 - Product and Company Identification

Synonyms: Salt water, Brine recycle stream, Sodium chloride solution
Chemical Name: Brine solution
Chemical Family: Mixture
Material Use: Operation of underground storage caverns and for salt manufacturing
Chemical Formula: Na+ (aq) Cl- (aq); sodium chloride in solution

NOVA Chemicals
P.O. Box 2518, Station M
Calgary, Alberta, Canada T2P 5C6

Product Information: 1-412-490-4063

EMERGENCY Telephone Numbers:
North America (Canada and US):
1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)
1-800-424-9300 (CHEMTREC-USA) (24 hours)
1-613-996-6666 (Canutec-Canada) (24 hours)
Mexico and South America: +44 208 762 8322 (NCEC) (24 hours)

Section 2 - Hazards Identification

HMIS Ratings: Health: 1 **Fire:** 0 **Physical Hazard:** 0
*Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard*
NFPA Ratings: Health: 0 **Fire:** 0 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Emergency Overview
CAUTION! Product is a clear to cloudy white liquid with no odor. This product may be irritating to the eyes, skin, and respiratory system.

Potential Health Effects: Eye
This product may cause eye irritation. Symptoms may include itching, reddening, excess tearing and swelling.

Potential Health Effects: Skin
This product may cause drying, irritation and possible dermatitis.

Potential Health Effects: Ingestion
Ingestion of very large quantities may cause nausea, vomiting, dehydration, diarrhea, edema, and possible death. Prolonged over consumption may result in high blood pressure and heart problems.

Potential Health Effects: Inhalation
This product may cause irritation to the respiratory system.

Section 3 - Composition/Information on Ingredients

CAS #	Component	Percent by Wt.
7732-18-5	Water	74-78
7647-14-5	Sodium chloride	22-26

Additional Information
This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
This material is a controlled product under Canadian WHMIS regulations.
This material is not regulated as a hazardous material / dangerous goods for transportation.

See Section 8 for applicable exposure limits. See Section 11 for applicable toxicity data.

Section 4 - First Aid Measures

First Aid: Eyes
Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention if symptoms develop or persist.

First Aid: Skin
Remove contaminated clothing and shoes. For skin contact, wash immediately with soap and water. Seek medical attention if symptoms develop or persist.

First Aid: Inhalation

Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

First Aid: Notes to Physician

Treat symptomatically. Treatment for overexposure should be directed at controlling the symptoms and clinical condition of the patient. Unless symptoms reappear, no further treatment is required. For more detailed medical emergency support information call 1-800-561-6682 or 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response).

Section 5 - Fire Fighting Measures

See Section 9: Physical Properties for flammability limits, flash point and auto-ignition information.

General Fire Hazards

Not a fire hazard. Does not burn.

Explosion Hazards

Not an explosion hazard.

Hazardous Combustion Products

None. Does not burn.

Extinguishing Media

Does not burn. Use extinguishing media suitable to surrounding fire conditions; e.g. dry chemical, foam, carbon dioxide, water fog or water spray.

Fire Fighting Equipment/Instructions

Firefighters should wear personal protective equipment suitable for the fire conditions and the materials burning.

Section 6 - Accidental Release Measures

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Small Spills

Stop or reduce discharge if safe to do so. Prevent entry into water intakes and waterways. Remove liquid material with approved pumps or vacuum equipment.

Large Spills

Stop or reduce leak. Isolate, contain, and attempt to recover. Prevent entry into water intakes and waterways. Remove liquid material with approved pumps or vacuum equipment. Spill area may be washed down with water, with wash waters collected for testing and proper disposal.

Special Procedures

Contact local police/emergency services and appropriate emergency telephone numbers provided in Section 1. Ensure that statutory and regulatory reporting requirements in the applicable jurisdiction are met. Wear appropriate protective equipment and clothing during clean-up. Individuals without appropriate protective equipment should be excluded from area of spill until cleanup has been completed.

Section 7 - Handling and Storage

Handling Procedures

Material is slowly corrosive to metal. Handle in properly designed and approved equipment systems. Periodically inspect pipelines and other equipment for integrity and corrosion. Do not ingest or inhale. If ingested, seek medical advice immediately. Avoid contact with skin and eyes. Keep away from incompatible materials. After handling, always wash hands thoroughly with soap and water.

Storage Procedures

Storage area should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Adequate security must be provided so that unauthorized personnel do not have access to the product. Storage ponds and tank areas should be periodically inspected and kept separate from fresh water supply or outlets.

See Section 8: for appropriate Personal Protective Equipment and see Section 10 for information on Incompatibilities.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

A: General Product Information

Keep formation of airborne dusts or mists to a minimum. Ensure that eyewash stations and safety showers are proximal to the workstation location.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH, EPA, Alberta, and Ontario have not developed exposure limits for any of this product's components. Other exposure limits may apply, check with proper authorities.

ENGINEERING CONTROLS

Provide adequate ventilation to maintain worker exposure below levels that are irritating to the eyes or skin. Administrative (procedure) controls and use of personal protective equipment may also be required.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Chemical goggles are recommended. If splashing is possible use chemical goggles and a full-face shield. Carefully rinse off contaminated goggles before removing.

Personal Protective Equipment: Skin/Hands/Feet

Use chemically resistant gloves when handling product. Wear chemical-resistant safety footwear with good traction to prevent slipping. Work clothing that sufficiently prevents skin contact should be worn, such as coveralls and/or long sleeves and pants. If splashing or contact with liquid material is possible, consider the need for an impervious overcoat.

Personal Protective Equipment: Respiratory

If engineering controls and ventilation is not sufficient to prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA approved respiratory protection should be used.

Personal Protective Equipment: General

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain, and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Section 9 - Physical & Chemical Properties

Physical State and Appearance:	Clear/Cloudy Liquid	**Color:**	Clear to white
Odor:	Odorless	**pH:**	6.5-8.5
Vapor Density @ 0°C (Air=1):	Not applicable	**Vapor Pressure:**	Not available
Boiling Point:	>100°C (>212°F)	**Melting Point:**	-10°C (14°F)
Solubility (H2O):	Miscible (water-based solution)	**Specific Gravity (Water=1):**	1.1-1.3
Auto Ignition:	Not applicable	**Flash Point:**	Not applicable
Lower Flammable Limit (LFL):	Not applicable	**Flash Point Method:**	Not applicable
Upper Flammable Limit (UFL):	Not applicable	**Flammability Classification:**	Non-flammable

Section 10 - Stability & Reactivity Information

Chemical Stability

This product is a stable material.

Chemical Stability: Conditions to Avoid

None identified.

Incompatibility

In presence of air, liquid contact or mists will slowly corrode most metals.

Hazardous Polymerization
Will not occur.

Corrosivity
Considered to be corrosive to most metals upon prolonged contact.

Hazardous Decomposition
None identified. Does not burn.

Section 11 - Toxicological Information

A: Acute Toxicity - General Product Information
This product has not been tested.

B: Acute Toxicity - LD50/LC50
Water (7732-18-5)
Oral LD50 Rat: >90 mL/kg
Sodium chloride (7647-14-5)
Inhalation LC50 Rat: >42 g/m3/1H; Oral LD50 Rat: 3 g/kg; Dermal LD50 Rabbit: >10 g/kg

C: Chronic Toxicity - General Product Information
This product has not been tested.

D: Chronic Toxicity - Carcinogenic Effects
None of this product's components are listed by ACGIH, EPA, IARC, OSHA, or NTP as a carcinogen.

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information
This product has not been tested. A concentrated brine solution (~26% sodium chloride) will dehydrate animal and vegetative species. Sodium chloride is practically non-toxic to aquatic organisms.

B: Component Analysis - Ecotoxicity - Aquatic/Terrestrial Toxicity
Sodium chloride (7647-14-5)
96 Hr LC50 Lepomis macrochirus: 9675 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 12946 mg/L [static]; 96 Hr LC50 Pimephales promelas: 7650 mg/L [static]; 48 Hr EC50 Daphnia magna: 1000 mg/L

Environmental Fate/Mobility
This product has not been tested. Brine does not partition to air. When spilled into a body of water, the brine will disperse in and mix with the water. A large brine spill into a body of water could result in stratification with the water floating on top of the brine. Eventually the two will mix. When spilled onto soil, brine will behave similar to spilled water. Sodium chloride may leach from soil into groundwater.

Persistence/Degradability
This product has not been tested. Brine (sodium chloride) is not biodegradable.

Bioaccumulation/Accumulation
This product has not been tested.

Section 13 - Disposal Considerations

U.S./Canadian Waste Number & Descriptions

A: General Product Information
This product is not expected to be a hazardous waste according to US regulations. This product may meet the definition of a hazardous waste according to Canadian regulations. The use, mixing or processing of this material may alter this product. Contact federal, provincial/state and local authorities in order to generate or ship a waste material associated with this product to ensure materials are handled appropriately and meet all criteria for disposal of hazardous waste.

See Section 7: Handling and Storage and Section 8: Exposure Controls/Personal Protection for additional handling information that may be applicable for safe handling and the protection of employees.

B: Component Waste Numbers
No EPA Waste Numbers are applicable for this product's components.

Section 14 - Transportation Information

US DOT Information

Shipping Name: NOT REGULATED as a Hazardous Material for Transportation.

Canadian TDG Information

Shipping Name: NOT REGULATED as a Dangerous Good for Transportation.

International Air Transport Association (IATA) and ICAO Information

Shipping Name: NOT REGULATED as a Dangerous Good for Transportation.

International Maritime Dangerous Goods (IMDG) Code

Shipping Name: NOT REGULATED as a Dangerous Good for Transportation.

Section 15 - Regulatory Information

A: International Regulations

Component Analysis - International Inventory Status

Component	CAS #	US - TSCA	CANADA - DSL	EU - EINECS
Water	7732-18-5	Yes	Yes	Yes
Sodium chloride	7647-14-5	Yes	Yes	Yes

B: USA Federal & State Regulations

Ongoing occupational hygiene, medical surveillance programs, or site emission or spill reporting may be required by Federal or State regulations. Check for applicable regulations.

USA OSHA Hazard Communication Class

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
HCS Classes:
HCS CLASS: Irritating substance.

USA Right-to-Know - Federal

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

USA Right-to-Know - State

None of this product's components are listed on the state lists from NJ or PA. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right-To-Know lists of other U.S. states. The reader is therefore cautioned to contact his or her NOVA Chemicals' representative or NOVA Chemicals' Product Integrity group for further U.S. State Right-To-Know information.

C: Canadian Regulations - Federal and Provincial

Canadian Environmental Protection Act (CEPA): All components of this product are on the Domestic Substances List (DSL), and are acceptable for use under the provisions of CEPA.

WHMIS Ingredient Disclosure List (IDL)

No components are listed under the Canadian Hazardous Products Act Ingredient Disclosure List (IDL).

WHMIS Classification

Workplace Hazardous Materials Information System (WHMIS): This product has been classified in accordance with Canadian Controlled Product Regulations (CPR) hazard criteria and this MSDS contains complete CPR-required information.
WHMIS CLASS D2B: Skin irritation

Other Regulations

Ongoing occupational hygiene, medical surveillance programs, or site emission or spill reporting may be required by Federal or Provincial regulations. Check for applicable regulations.

Section 16 - Other Information

Label Information

CAUTION! Product is a clear to cloudy white liquid with no odor. This product may be irritating to the eyes, skin, and respiratory system.
FIRST AID:
SKIN: Remove contaminated clothing and shoes. For skin contact, wash immediately with soap and water. Seek medical attention if symptoms develop or persist.

EYES: Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical if symptoms develop or persist.
INHALATION: Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist.
INGESTION: DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Have affected individual rinse out mouth. Seek immediate medical attention.

IN CASE OF LARGE SPILL: Stop or reduce leak. Isolate, contain, and attempt to recover. Prevent entry into water intakes and waterways. Remove liquid material with approved pumps or vacuum equipment. Spill area may be washed down with water, with wash waters collected for testing and proper disposal.

References

Available on request

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; BLEVE = Boiling Liquid Expanding Vapor Explosion; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Substances; EPA = Environmental Protection Agency; EU = European Union; FDA = Food and Drug Administration; IARC = International Agency for Research on Cancer; IDL = Ingredient Disclosure List; Kow = Octanol/water partition coefficient; LEL = Lower Explosive Limit; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; RCRA = Resource Conservation and Recovery Act; SARA = Superfund Amendments and Reauthorization Act; TDG = Transportation of Dangerous Goods; TSCA = Toxic Substances Control Act.

MSDS Prepared by: NOVA Chemicals

MSDS Information Phone Number: 1-412-490-4063

MSDS Information Email: msdsemail@novachem.com

Other Information

Notice to Reader:
ALTHOUGH THE INFORMATION CONTAINED IN THIS DOCUMENT IS PRESENTED IN GOOD FAITH, BASED ON AVAILABLE INFORMATION BELIEVED TO BE RELIABLE AT THE TIME OF PREPARATION OF THIS DOCUMENT, **NOVA CHEMICALS MAKES NO WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION OR THE PRODUCT/MATERIALS DESCRIBED HEREIN, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES AND CONDITIONS (INCLUDING ALL WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE). NO FREEDOM FROM INFRINGEMENT OF ANY PATENT OWNED BY NOVA CHEMICALS OR OTHERS IS TO BE INFERRED. THIS INFORMATION IS SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE CONTACT NOVA CHEMICALS FOR THE MOST CURRENT VERSION OF THIS MSDS. NOVA CHEMICALS DOES NOT ASSUME RESPONSIBILITY FOR MSDS OBTAINED FROM THIRD PARTY SOURCES.**

RESPONSIBILITY FOR USE, STORAGE, HANDLING AND DISPOSAL OF THE PRODUCT/MATERIALS DESCRIBED HEREIN, WHETHER ALONE OR IN COMBINATION WITH ANY OTHER SUBSTANCE, IS THAT OF THE PURCHASER AND/OR END USER.

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This is the end of MSDS # NOVA-0087.

TETRA Technologies, Inc.

MATERIAL SAFETY DATA SHEET

TETRA

CALCIUM CHLORIDE SOLID

1. PRODUCT AND COMPANY IDENTIFICATION

TETRA Technologies, Inc. 25025 I-45 North The Woodlands, TX 77380	CHEMTREC (24-Hr Emergency Response):	(800) 424-9300
	Poison Control:	(800) 222-1222
	Nonemergency Customer Service:	(281) 367-1983

Substance:	Calcium Chloride Solid
Synonyms:	Briners Grade, EXPRESS®, EXPRESS® RM, FCC Dry Food Grade Calcium Chloride, Ice Blaster®, TETRA 75™ C, TETRA 80™, TETRA 80™ C, TETRA 80™ HP, TETRA 80™ P, TETRA 94™, TETRA Flake, TETRA SG™, WaterShield™, Winter Thaw™
Chemical Family	Inorganic Salt
MSDS Creation Date:	07 Feb 94
MSDS Revision Date:	15 Nov 04

2. COMPOSITION, INFORMATION ON INGREDIENTS

CAS Number	Wt %	Component Name	RTECS Number
10043-52-4	74-100%	Calcium Chloride	EV9800000

Probable Contaminants: Calcium Carbonate, Calcium Hydroxide, Calcium Oxide, Alkali Metal Chlorides, Alkaline Earth Metal Chlorides

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4):	Health – 1 Fire – 0 Reactivity – 1
Emergency Overview:	Odorless, white pellets/flake. Causes eye irritation. Avoid breathing dust. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling. Reacts with water to liberate heat.
Potential Health Effects:	
Inhalation:	Dust may cause irritation to mucous membranes and respiratory system.
Skin Contact:	May cause irritation.
Eye Contact:	May irritate or burn eyes.
Ingestion:	Ingestion may cause nausea.
Carcinogen Status:	OSHA – No NTP – No IARC – No

4. FIRST AID MEASURES

Eye Contact:	Flush eyes thoroughly with large amounts of water. If irritation or adverse symptoms develop, seek medical attention.
Skin Contact:	Remove contaminated clothing and shoes. Wash affected area with soap or mild detergent.
Inhalation:	Remove from exposure area to fresh air.
Ingestion:	Get medical attention.
Notes to Physician:	Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flash Point:	Not applicable
Extinguishing Media:	Dry chemical, carbon dioxide, water spray or regular foam. For larger fires, use water spray, fog or regular foam (1996 North American Emergency Response Guidebook, RSPA P 5800.7).
Fire Fighting:	Move container(s) from fire area if you can without risk. Apply cooling water sides of containers that are exposed to flames until well after fire is out. Extinguish fire using agent suitable for type of surrounding fire and/or chemicals. Do not use water directly on material. Avoid breathing corrosive vapors; keep upwind. Dike area to prevent runoff and contamination of wate sources.
Fire and Explosion Hazard:	Negligible fire hazard when exposed to heat or flame
Products of Combustion:	Not applicable

6. ACCIDENTAL RELEASE MEASURES

Evacuation and Safety:	Wear appropriate protective gear for the situation. See personal protection information in Section 8.
Containment of Spill:	For dry spills place material in covered, clean, dry container for disposal.
Cleanup and Disposal:	For dry spills place material in covered, clean, dry container for disposal.

7. HANDLING AND STORAGE

Handling:	Avoid skin and eye contact and breathing dusts. Wash thoroughly after handling. Launder contaminated clothing before re-use.
Storage:	Observe all federal, state, and local regulations when storing this product. Store in a covered, clean and dry container away from incompatible material

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	Provide local exhaust ventilation system. Where there is possibility of exposure, eye wash fountain and safety shower should be provided within th immediate work area for emergency use.
Exposure Limits:	No occupational exposure limits established by OSHA/ACGIH/NIOSH.
Eyes:	Wear safety glasses with splash shields or safety goggles/shield.
Body:	Wear appropriate protective (impervious) clothing. Leather work boots and/o leather products will dehydrate with resultant shrinkage and possible destruction.
Respiratory:	A respirator is not indicated under normal operating conditions. Use of a NIOSH approved respirator should be based upon the presence of nuisance dust. When warranted, use a face mask particulate respirator with a NIOSH N95 rating such as Moldex 2800N95, MSA 816581 or 3M 8576PN5 or equivalent.
Hands and Feet:	Wear appropriate non-leather protective gloves and boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Description:	White pellets/flakes
Odor:	Odorless
Boiling Point:	Not applicable
Melting Point:	369°F (187°C) - 1424°F (773°C)
Molecular Weight:	111.0 – 150.0
Specific Gravity:	2.15 @ 77°F (25°C)
Water Solubility:	40% @ 68°F (20°C) with evolution of heat
Solvent Solubility:	Soluble in alcohol, acetic acid and acetone
Vapor Pressure:	Not available
Viscosity:	Not applicable

10. STABILITY AND REACTIVITY

Stability and Reactivity:	Reacts exothermically with water.
Incompatibilities:	Strong oxidizing agents.
Hazardous Decomposition:	None under normal conditions.
Polymerization:	Does not occur under normal temperatures and pressures.
Conditions to Avoid:	None.

11. TOXICOLOGICAL INFORMATION

Toxicity Data (anhydrous calcium chloride):	
TD_{LO}:	112g/kg, oral, 20 weeks, rat
LD_{LO}:	274 mg/kg, subcutaneous, dog
LD_{50}:	1000 mg/kg, oral, rat
LD_{50}:	264 mg/kg, intraperitoneal, rat
Mutagenic Data and Tumorigenic Data:	See Registry of Toxic Effects of Chemical Substances (RTECS) file.
Carcinogen Status:	None
Local Effects:	Eye, mucous membrane and skin irritant.
Health Effects:	Moderately toxic by ingestion, slightly toxic by dermal absorption.

12. ECOLOGICAL INFORMATION

Environmental Summary:	No data available.
Degradability:	Product will not biodegrade or accumulate.

13. DISPOSAL INFORMATION

Observe all federal, state and local regulations when disposing of this substance.

14. DEPARTMENT OF TRANSPORTATION (DOT) TRANSPORT INFORMATION

Shipping Name:	Not regulated
ID Number:	Not applicable
Hazard Class or Division:	Not applicable
Packing Group:	Not applicable
Labeling Requirements:	Not applicable
Packing Authorizations:	
Exceptions:	Not applicable
Non-bulk Packing:	Not applicable
Bulk Packing:	
Quantity Limitations:	
Passenger Aircraft or Railcar:	Not applicable
Cargo Aircraft Only:	Not applicable
Vessel Stowage Requirements:	Not applicable
Emergency Guide Number:	Not applicable

15. REGULATORY INFORMATION

Workplace Classification:	
SARA Title III:	Section 311: Acute Hazard, Reactivity Hazard
TSCA Status:	Yes
EINECS Status:	Yes
CERCLA:	No
OSHA Process Safety:	No
California Proposition 65:	No ingredients found on the Proposition 65 list
WHMIS Classification:	Not determined

16. OTHER INFORMATION

Individuals handling this product should be informed of the recommended safety precautions and should have access to this information.

This information relates to the specific product designated and may not be valid for such product used in combination with any other materials or in any other processes. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability, or completeness. It is the users' responsibility to satisfy themselves as to the suitability and completeness of such information for their own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

TETRA Technologies, Inc. reserves the right to refuse shipment of this product to any consumer who fails to demonstrate the ability to consistently handle and use it safely and in compliance with all applicable laws, rules and regulations. Such demonstration may require on-site inspection of any or all storage, processing, packaging and other handling systems that come in contact with it.

Customers are responsible for compliance with local, state and federal regulations that may be pertinent in the storage, application and disposal of this product.

TETRA Technologies, Inc.

MATERIAL SAFETY DATA SHEET

TETRA

CALCIUM CHLORIDE SOLUTION

1. PRODUCT AND COMPANY IDENTIFICATION

TETRA Technologies, Inc. 25025 I-45 North The Woodlands, TX 77380	CHEMTREC (24-Hr Emergency Response):	(800) 424-9300
	Poison Control:	(800) 222-1222
	Nonemergency Customer Service:	(281) 367-1983

Substance:	Calcium Chloride Solution
Synonyms:	Liquid Calcium Chloride, Road Master™, Superset™, Food Grade Liquid Calcium Chloride
Chemical Family	Inorganic Salt
MSDS Creation Date:	01 Mar 94
MSDS Revision Date:	14 Oct 04

2. COMPOSITION, INFORMATION ON INGREDIENTS

CAS Number	Wt %	Component Name	RTECS Number
10043-52-4	20 – 45%	Calcium Chloride	EV9800000
	55 – 80%	Water	

Probable Contaminants: Calcium Carbonate, Calcium Hydroxide, Calcium Oxide, Alkali Metal Chlorides, Alkaline Earth Metal Chlorides

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4):	Health – 1 Fire – 0 Reactivity – 0
Emergency Overview:	Odorless, clear to amber liquid. May cause skin, respiratory tract, and eye irritation.
Potential Health Effects:	
Inhalation:	Mist inhalation may cause minor irritation.
Skin Contact:	May cause minor irritation.
Eye Contact:	May irritate or burn eyes.
Ingestion:	May irritate gastrointestinal tract and cause nausea and vomiting.
Carcinogen Status:	OSHA – No NTP – No IARC – No

4. FIRST AID MEASURES

Eye Contact:	Flush eyes thoroughly with water. If irritation or adverse symptoms develop, seek medical attention.
Skin Contact:	Remove contaminated clothing and shoes. Wash affected area with soap or mild detergent.
Inhalation:	Remove from exposure. If breathing is difficult or irritation develops, seek medical attention.
Ingestion:	Get medical attention.
Notes to Physician:	Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES	
Flash Point:	Not applicable
Extinguishing Media:	Use extinguishing media appropriate for surrounding fire.
Fire Fighting:	Negligible fire hazard, not applicable.
Fire and Explosion Hazard:	Negligible
Products of Combustion:	Non-combustible
6. ACCIDENTAL RELEASE MEASURES	
Evacuation and Safety:	Wear appropriate protective gear for the situation. See personal protection information in Section 8.
Containment of Spill:	For small spills, take up with sand or other absorbent material and place in containers for disposal. For larger spills, dike far ahead of spill for later disposal.
Cleanup and Disposal:	For small spills, take up with sand or other absorbent material and place in containers for disposal. For larger spills, dike far ahead of spill for later disposal.
7. HANDLING AND STORAGE	
Handling:	Avoid skin and eye contact and breathing vapors or mists. Wash thoroughly after handling. Launder contaminated clothing before re-use.
Storage:	Observe all federal, state, and local regulations when storing this product. Store in a tightly closed container away from incompatible materials. Do not store in metals which this solution corrodes.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION	
Engineering Controls:	Provide local exhaust ventilation system. Where there is possibility of exposure, eye wash fountain and safety shower should be provided within the immediate work area for emergency use.
Exposure Limits:	ACGIH – (TLV-TWA) guidline for nuisance particulate (liquified mist) 10mg/m3
Eyes:	Wear safety glasses with splash shields or safety goggles/shield.
Body:	Wear appropriate normal work clothing. Leather work boots and/or leather products will dehydrate with resultant shrinkage and possible destruction.
Respiratory:	Respirator not generally required. For misty conditions, wear NIOSH approved mist respirator.
Hands and Feet:	Wear appropriate non-leather protective gloves and boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Description:	Clear to amber liquid.
Odor:	Odorless
Boiling Point:	118°C (244°F) for 38% solution
Melting Point:	Not available
Molecular Weight:	110.99 (for pure $CaCl_2$)
Specific Gravity (H_2O=1):	1.376 @ 25°C (77°F) for 38% solution
pH:	3.8 – 9.0
Water Solubility:	Miscible with water in all proportions
Solvent Solubility:	Miscible in alcohol, acetic acid and acetone
Vapor Pressure:	Not available
Viscosity:	Not available

10. STABILITY AND REACTIVITY

Stability and Reactivity:	Stable under normal temperatures and pressures.
Incompatibilities:	Strong oxidizing agents.
Hazardous Decomposition:	None under normal conditions.
Polymerization:	Does not occur under normal temperatures and pressures.
Conditions to Avoid:	None.

11. TOXICOLOGICAL INFORMATION

Toxicity Data (anhydrous calcium chloride):	
TD_{LO}:	112g/kg, oral, 20 weeks, rat
LD_{LO}:	274 mg/kg, subcutaneous, dog
LD_{50}:	1000 mg/kg, oral, rat
LD_{50}:	264 mg/kg, intraperitoneal, rat
Mutagenic Data and Tumorigenic Data:	See Registry of Toxic Effects of Chemical Substances (RTECS) file.
Carcinogen Status:	None
Local Effects:	Eye, mucous membrane and skin irritant.
Health Effects:	Moderately toxic by ingestion, slightly toxic by dermal absorption.

12. ECOLOGICAL INFORMATION

Environmental Summary:	No data available.
Degradability:	Product will not biodegrade or accumulate.

13. DISPOSAL INFORMATION

Observe all federal, state and local regulations when disposing of this substance.

14. DEPARTMENT OF TRANSPORTATION (DOT) TRANSPORT INFORMATION

Shipping Name:	Not regulated
ID Number:	Not applicable
Hazard Class or Division:	Not applicable
Packing Group:	Not applicable
Labeling Requirements:	Not applicable
Packing Authorizations:	
Exceptions:	Not applicable
Non-bulk Packing:	Not applicable
Bulk Packing:	
Quantity Limitations:	
Passenger Aircraft or Railcar:	Not applicable
Cargo Aircraft Only:	Not applicable
Vessel Stowage Requirements:	Not applicable
Emergency Guide Number:	Not applicable

15. REGULATORY INFORMATION

Workplace Classification:	
SARA Title III:	Section 311: Acute Hazard
TSCA Status:	Yes
EINECS Status:	Yes
CERCLA:	No
OSHA Process Safety:	No
California Proposition 65:	No ingredients found on the Proposition 65 list
WHMIS Classification:	Not determined

16. OTHER INFORMATION

Individuals handling this product should be informed of the recommended safety precautions and should have access to this information.

This information relates to the specific product designated and may not be valid for such product used in combination with any other materials or in any other processes. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability, or completeness. It is the users' responsibility to satisfy themselves as to the suitability and completeness of such information for their own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

TETRA Technologies, Inc. reserves the right to refuse shipment of this product to any consumer who fails to demonstrate the ability to consistently handle and use it safely and in compliance with all applicable laws, rules and regulations. Such demonstration may require on-site inspection of any or all storage, processing, packaging and other handling systems that come in contact with it.

Customers are responsible for compliance with local, state and federal regulations that may be pertinent in the storage, application and disposal of this product.

Cutler-Magner Company

Material Safety Data Sheet

PRODUCT IDENTIFICATION	CHEMICAL ABSTRACT NO.	DATE REVISED
CALCIUM OXIDE - Quicklime	CAS No. 1305-78-8	01/03/2006

Section I

MANUFACTURER

Cutler-Magner Company
Foot of Hill Avenue
Superior, WI 54880

24 Hour Emergency Contact Number: (715) 392-5146
Ask for Supervisor On Call

Telephone Number for Information: (800) 232-1302

HMIS II SAFETY RATING

Health - **3**
Flammability - **0**
Physical Hazard - **2**
Personal Protective Equip - **E**

Other Common Names: Pebble Lime, Unslaked Lime
Trade Names: Rockport

Section II – Hazardous Ingredients / Identity Information

Specific Chemical Identity; Common Names	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (Optional)
Calcium Oxide; Lime; Quicklime	5 mg/m^3	2 mg/m^3		
Crystalline Silica (Quartz)	0.1 mg/m^3	0.05 mg/m^3	Respirable	0.1 to 0.3 %

Calcium oxide is not listed on the NTP, IARC, or OSHA lists of carcinogens. Crystalline silica, a component of this product, is listed by IARC and NTP but not by OSHA. In 1997, IARC determined that "crystalline silica inhaled in the form or quartz or crystobalite from occupational sources is carcinogenic to humans (Group 1). OSHA requires that products containing 0.1% of a known carcinogen must be labeled. NTP states that "silica, crystalline (respirable)" may reasonably be anticipated to be a carcinogen (1991). Cutler-Magner Company recommends using personal protection equipment when handling this product.

Section III – Physical / Chemical Characteristics

Boiling Point (Calcium Oxide)	2850 °C	Specific Gravity (H_2O=1)	3.2-3.4
Vapor Pressure (mm Hg)	NA	Melting Point	2570 °C
Vapor Density (Air = 1)	NA	Evaporation Rate	NA
Solubility in Water	Reacts to form calcium hydroxide		
Appearance and Color	White to gray lumps, pebbles, granules, powder; faint earthy odor		

Section IV – Fire and Explosion Hazard Data

Flash Point	NA	Flammable Limits – NA
Extinguishing Method	NA	
Special Fire Fighting Procedures	Reaction with water may produce enough heat to ignite combustible material.	
Unusual Fire and Explosion Hazards	Material is an explosion hazard when wet and confined.	

Section V – Reactivity Data

Stability	Unstable		Conditions to Avoid – NA
	Stable	X	
Incompatibility (Materials to Avoid)		Water, Acid, Interhalogen, Phosphorus (V) Oxide	
Hazardous Decomposition or Byproducts		None	
Hazardous Polymerization	May Occur		Conditions to Avoid – NA
	Will Not Occur	X	

Section VI – Health Hazard Data

Route(s) of Entry	Inhalation? - YES	Absorption Through Skin? – YES	Ingestion (swallowing)? - YES
Health Hazards	Acute	Causes irritation and inflammation to mucous membrane and respiratory passages.	
	Chronic	Long-term exposure can cause irritation, ulceration and perforation of nasal septum.	
Toxicological Information	No LD50 / LC50 have been identified for this product. Quicklime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain trace amounts of crystalline silica, which has been classified by IARC as (Group 1) carcinogenic to humans when inhaled in the form of quartz or crystobalite.		
Signs and Symptoms of Exposure		Irritation of skin, eyes, and respiratory tract.	
Medical Conditions Generally Aggravated by Exposure		Respiratory disease, skin condition.	
Emergency and First Aid Procedures		Remove to fresh air. Wash dust with soap and water. Flush out eyes with generous amounts of water. Drink plenty of water if swallowed. See Physician.	

Section VII – Precautions for Safe Handling

Steps to Be Taken in Case Material is Released or Spilled	Normal clean-up procedures. Care should be taken to avoid causing dust to become airborne. Vacuum cleaning systems are recommended.
Waste Disposal Method	Dispose of product in accordance with Federal, State and Local regulations.
Precautions to Be Taken in Handling	Store away from water and acids.
Other Precautions	Waste should not be discarded with combustible material where the possibility exists of getting the mixture wet – FIRE HAZARD!

Section VIII – Control Measures

Respiratory Protection - Dust filter mask is recommended as minimal protection		
Ventilation	Local Exhaust – To maintain TLV and PEL Mechanical – To maintain TLV' and PEL	Special – None Other – None
Protective Gloves – Cloth or leather gloves will protect skin		
Eye Protection – Fitted goggles will reduce eye injury		
Other Protective Clothing – Long sleeve shirts and pants		
Work / Hygienic Practices – Maintain dust exposure limits below TLV and PEL. If not possible – use respiratory protection		

Section IX – Ecological Information

Ecotoxicity: Because of the high pH of this product, in high concentrations it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

Environmental Fate: This material shows no bioaccumulation effect or food chain toxicity.

Section X – Regulatory Information

EPA

RCRA Hazardous Waste Classification (40 CFR 261): Not Listed
RCRA Hazardous Waste Number (40 CFR 261.33): Not Listed
ERCLA Hazardous Substance (40 CFR 302.4): Unlisted specific per RCRA, Sec. 3001; CWA, Sec.311 (b)(4); CWA, Sec. 307(a), CAA, Sec. 112
CERCLA Reportable Quantity (RQ): Not Listed
SARA 311/312 Codes: Not Listed
SARA Toxic Chemical (40 CFR 372.65): Not Listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not Listed; Threshold Planning Quantity (TPQ): Not Listed
All chemical ingredients are listed on the USEPA TSCA Inventory List

OSHA / MSHA

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): 5 mg/M^3 TWA-8
MSHA: Not Listed
OSHA Specifically Regulated Substance (29 CFR 1910): Not Listed

Canada

WHIMS Classification: "E" Corrosive Materials (Listed due to corrosive effect of aluminum)
WHIMS Classification: "D2A" Materials Causing Other Toxic Effects
CANADA DSL: Listed

State Regulations

Consult state and local authorities for guidance

Other

HMIS: Health Risk 3, Flammability 0, Reactivity 1, Personal Protection E
NFPA: Health Hazard 3, Fire Hazard 0, Reactivity 1
DOT: For aircraft transport only, Calcium Oxide is classified as Hazard Class 8
- Corrosive, UN 1910, Packing Group 3

The above information is believed to be correct as of the date hereof. However, no warranty of merchantability, fitness for any use, or any other warranty is expressed or is to be implied regarding the accuracy of these data, the results to be obtained from the use of the material, or the hazards connected with such use. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the data hereof may suggest modification of the information, we do not assume responsibility for the results of its use. This information is furnished on the condition that the person(s) receiving it shall make their own determination as to the suitability of the material for their particular purpose and on the condition that they assume the risk of use thereof.

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: CHLORINE

TRADE NAMES/SYNONYMS:
MTG MSDS 22; CHLORINE MOLECULAR; DIATOMIC CHLORINE; DICHLORINE; MOLECULAR CHLORINE; UN 1017; Cl2; MAT04600; RTECS FO2100000

CHEMICAL FAMILY: halogens, gas

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 16 2002

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CHLORINE
CAS NUMBER: 7782-50-5
PERCENTAGE: 100.0

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: yellow or green
PHYSICAL FORM: gas
ODOR: distinct odor, irritating odor
MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract burns, skin burns, eye burns
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat. May ignite combustibles.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: burns, chest pain, difficulty breathing, headache, dizziness, hyperactivity, emotional disturbances, bluish skin color, lung damage, death
LONG TERM EXPOSURE: burns, skin disorders, lack of sense of smell, lung damage
SKIN CONTACT:
SHORT TERM EXPOSURE: burns
LONG TERM EXPOSURE: burns
EYE CONTACT:

SHORT TERM EXPOSURE: burns
LONG TERM EXPOSURE: burns
INGESTION:
SHORT TERM EXPOSURE: ingestion of harmful amounts is unlikely
LONG TERM EXPOSURE: ingestion of harmful amounts is unlikely

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. Give large amounts of water or milk. Allow vomiting to occur. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. Avoid gastric lavage or emesis.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

EXTINGUISHING MEDIA: water

Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents. Large fires: Flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. For small fires, contain and let burn. Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuation radius: 800 meters (1/2 mile).

SECTION 6 ACCIDENTAL RELEASE MEASURES

AIR RELEASE:
Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE:
Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).

WATER RELEASE:
Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Absorb with activated carbon. Collect spilled material using mechanical equipment.

OCCUPATIONAL RELEASE:
Stop leak if possible without personal risk. Avoid contact with combustible materials. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Keep separated from incompatible substances. Store outside or in a detached building. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
CHLORINE:
1 ppm (3 mg/m3) OSHA ceiling
0.5 ppm (1.5 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
1 ppm (3 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
0.5 ppm ACGIH TWA
1 ppm ACGIH STEL
0.5 ppm (1.45 mg/m3) NIOSH recommended ceiling 15 minute(s)

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

5 ppm
Any chemical cartridge respirator with cartridge(s) providing protection against this substance.
Any supplied-air respirator.
10 ppm
Any supplied-air respirator operated in a continuous-flow mode.
Any powered, air-purifying respirator with cartridge(s) providing protection against this substance.
Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against this substance.
Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Escape -
Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: yellow or green
ODOR: distinct odor, irritating odor
MOLECULAR WEIGHT: 70.906
MOLECULAR FORMULA: Cl2
BOILING POINT: -31 F (-35 C)
FREEZING POINT: -150 F (-101 C)
VAPOR PRESSURE: 5168 mmHg @ 21 C
VAPOR DENSITY (air=1): 2.49
SPECIFIC GRAVITY: Not applicable
DENSITY: 3.214 g/L @ 0 C
WATER SOLUBILITY: 1.46% @ 0 C
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: 0.01 ppm
EVAPORATION RATE: Not applicable
VISCOSITY: 0.01327 cP @ 20 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: alkali

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid contact with combustible materials. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

INCOMPATIBILITIES: combustible materials, bases, metals, halogens, metal salts, reducing agents, amines, metal carbide, metal oxides, oxidizing materials, halo carbons, acids

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: chlorine

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

CHLORINE:
TOXICITY DATA:
293 ppm/1 hour(s) inhalation-rat LC50
CARCINOGEN STATUS: ACGIH: A4 -Not Classifiable as a Human Carcinogen
LOCAL EFFECTS:
Corrosive: inhalation, skin, eye
ACUTE TOXICITY LEVEL:
Toxic: inhalation
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart problems
TUMORIGENIC DATA: Available.
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 390 ug/L 96 hour(s) LC50 (Mortality) Orangethroat darter (Etheostoma spectabile)

INVERTEBRATE TOXICITY: 637.5 ug/L 1 hour(s) LC50 (Mortality) Pacific oyster (Crassostrea gigas)

ALGAL TOXICITY: 50-1000 ug/L 23 hour(s) (Population) Algae,phytoplankton,algal mat (Algae)

PHYTOTOXICITY: 20 ug/L 96 day(s) (Growth) Water-milfoil (Myriophyllum spicatum)

SECTION 13 DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Chlorine
ID NUMBER: UN1017
HAZARD CLASS OR DIVISION: 2.3
LABELING REQUIREMENTS: 2.3; 8
ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone B

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Chlorine
ID NUMBER: UN1017
CLASSIFICATION: 2.3, 8

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
CHLORINE: 10 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
CHLORINE: 100 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
CHLORINE: 10 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
CHLORINE

OSHA PROCESS SAFETY (29CFR1910.119):
CHLORINE: 1500 LBS TQ

STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: ACD1E

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

SECTION 16 OTHER INFORMATION

MSDS SUMMARY OF CHANGES
SECTION 15 REGULATORY INFORMATION

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Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Carbon dioxide Liquid Carbon dioxide	**Trade Name:**	Carbon dioxide Liquid Carbon dioxide
Product Use:	Many		
Chemical Name:	Carbon dioxide	**Synonym:**	Carbon anhydride, Carbonic acid gas.
Chemical Formula:	CO_2	**Chemical Family:**	Acid anhydrides (Acid.)
Telephone:	**Emergencies:** * 1-800-363-0042	**Supplier /Manufacture:**	Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
		Phone:	905-803-1600
		Fax:	905-803-1682

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Carbon dioxide	100	124-38-9	Not applicable.	Not available.	5000 ppm

3. Hazards Identification

Emergency Overview

CAUTION! High-pressure liquid and gas. Can cause rapid suffocation. Can increase respiration and heart rate. May cause nervous system damage. May cause frostbite. May cause dizziness and drowsiness. Self-contained breathing apparatus and protective clothing may be required by rescue workers.

ROUTES OF EXPOSURE: Inhalation. Skin contact. Eye contact.

THRESHOLD LIMIT VALUE: TLV-TWA Data from 2004 Guide to Occupational Exposure Values (ACGIH). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconciousness. Lack of oxygen can kill.

SKIN CONTACT: No harm expected from vapour. Liquid may cause frostbite.

SKIN ABSORPTION: No harm expected. Liquid may cause frostbite.

SWALLOWING:

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This product is a gas at normal temperature and pressure. Liquid may cause frostbite.

EYE CONTACT:

Vapour may cause a stinging sensation; liquid may cause frostbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:
No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE:
Damage to retial ganglion cells and central nervous system may occur.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
Repeated or prolonged exposure is not known to aggravate medical condition.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:
A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different time during gestation. There is no evidence that carbon dioxide is tetratogenic in humans.

CARCINOGENICITY:
Not listed as carcinogen by OSHA, NTP or IARC.

4. First Aid Measures

INHALATION:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

SKIN CONTACT:
For exposure to liquid, immediately warm frostbite area with warm water not to exceed 41 C. In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.

SWALLOWING:
This product is a gas at normal temperature and pressure.

EYE CONTACT:
For contact with the liquid, immediately flush eyes throughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN:
There is no specific antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition.

5. Fire Fighting Measures

FLAMMABLE :	No.	**IF YES, UNDER WHAT CONDITIONS?**	Not applicable.
FLASH POINT (test method)	Not applicable.	**AUTOIGNITION TEMPERATURE**	Not applicable.
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable.	**UPPER:**	Not applicable.

EXTINGUISHING MEDIA:
This material cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:
CAUTION! High-pressure gas. Asphxiant. Effects are due to lack of oxygen. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARD:

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Gas cannot catch fire. Container may rutpure due to heat of fire. No part of a container should be subjected to a temperature higher than 52 C. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature.

HAZARDOUS COMBUSTION PRODUCTS:

Not applicable.

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

CAUTION! **High-pressure gas.** Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING:

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

Extremely cold liquid and gas. Do not get liquid or vapours in eyes, on skin, or clothing. Safety showers and eyewash fountains should be immediately available. Use only in a closed system. Use piping and equipment adequately designed to withstand pressures to be encountered. ***Store and use with adequate ventilation at all times.*** Close valve after each use; keep closed even when empty. ***Prevent reverse flow.*** Reverse flow into cylinder may cause rupture. ***When returning cylinder to supplier,*** be sure valve is closed. ***Never work on a pressurized system.*** If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

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8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST: Preferred.

MECHANICAL (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

SPECIAL: Not applicable.

OTHER: Not applicable.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: Use air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with the provincial regulations or guidelines. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators". Respirators should be approved by NIOSH and MSHA.

SKIN PROTECTION: Insulated neoprene gloves.

EYE PROTECTION: Wear safety glasses when handling cylinders.

Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

9. Physical and Chemical Properties

PHYSICAL STATE:	Compressed Liquefied Gas.	**FREEZING POINT:**	Not applicable.	**pH:**	Not applicable.
BOILING POINT	Sublimation: -78.5 C	**VAPOUR PRESSURE**	5775.2 kPa (@ 20°C)	**MOLECULAR WEIGHT:**	44.01 g/mole
SPECIFIC GRAVITY: LIQUID (Water = 1)	Not applicable.	**SOLUBILITY IN WATER,**	Slight.		
SPECIFIC GRAVITY: VAPOUR (air = 1)	1.522	**EVAPORATION RATE** (Butyl Acetate=1):	>1 compared to (Butyl Acetate = 1)	**COEFFICIENT OF WATER/OIL DISTRIBUTION:**	Not applicable.
VAPOUR DENSITY:	0.00198 g/ml @ 0 C	**% VOLATILES BY VOLUME:**	100% (v/v).	**ODOUR THRESHOLD:**	Odourless.

APPEARANCE & ODOUR: Colourless. Odourless gas. It is felt by some to have a slight, pungent odour and biting taste.

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10. Stability and Reactivity

STABILITY:	The product is stable.
CONDITIONS OF CHEMICAL INSTABILITY:	Not applicable.
INCOMPATIBILITY (materials to avoid):	Alkali metats, alkaline earth metals, metal acetylides, chromium, titanium above 550 C, uranium above 750 C.
HAZARDOUS DECOMPOSITION PRODUCTS:	In the presence of an electrical discharge, carbon dioxide is decomposed to form carbon monoxide and oxygen.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	None known.

11. Toxicological Information

See section 3.

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

EFFECTS:	**CO_2 CONCENTRATION:**
Breathing rate increases slightly.	1%
Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	2%
Breathing increases to twice normal rate and become labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate.	3%
Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt.	4 - 5%
Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.	5 - 10%
Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	50 - 100%

12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

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14. Transport Information

TDG/IMO SHIPPING NAME: (Gas): Carbon dioxide; (Liquid): Carbon Dioxide, Refrigerated Liquid

HAZARD CLASS:	IDENTIFICATION #:	PRODUCT RQ:
CLASS 2.2: Non-flammable, non-corrosive and non-poisonous gas.	UN1013 (Gas) UN2187 (Liquid)	100 L

SHIPPING LABEL(s): Non-flammable, non-poisonous gas

PLACARD (when required): Non-flammable, non-poisonous gas

SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of vehicle can present serious safety hazards.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

WHMIS (Canada) CLASS A: Compressed gas.

International Regulations

EINECS Not available.

DSCL (EEC) This product is not classified according to the EU regulations.

International Lists No products were found.

16. Other Information

MIXTURES:

When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

HAZARD RATING SYSTEM:

HMIS RATINGS:

HEALTH 0
FLAMMABILITY 0
PHYSICAL HAZARD 0

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED: CGA-320
PIN-INDEXED YOKE: CGA-940

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ULTRA-HIGH-INTEGRITY CONNECTION: CGA-716

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

AV-1	Safe Handling and Storage of Compressed Gas
G-6	Carbon Dioxide
G-6.1	Standard for Low Pressure Carbon Dioxide Systems at Customer Sites
G-6.2	Commodity Specification for Carbon Dioxide
P-1	Safe Handling of Compressed Gases in Containers
P-14	Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmospheres
SB-2	Oxygen-Deficient Atmospheres
V-1	Compressed Gas Cylinder Valve Inlet and Outlet Connections
V-7	Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures
---	Handbook of Compressed Gases, Fourth Edition

PREPARATION INFORMATION:

DATE: 10/15/2004
DEPARTMENT: Safety and Environmental Services
TELEPHONE: 905-803-1600

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety nformation, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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PRAXAIR

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Mississauga, ON L5B 1M2

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MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Bayer Emergency Phone:	(412) 923-1800
Bayer Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name:	CAUSTIC SODA SOLUTION (50%)
Material Number:	3490347
Chemical Family:	Sodium hydroxide solution

2. Hazards Identification

Emergency Overview

DANGER! Color: Clear, Opaque **Form:** liquid **Odor:** Odorless.
Water runoff from fire fighting may be corrosive. Irritating gases/fumes may be given off during burning or thermal decomposition. Contact with metals liberates hydrogen gas. Reacts violently with water. Causes respiratory tract burns. Causes skin burns. May be harmful if absorbed through skin. Causes eye burns. Causes digestive tract burns. Harmful if swallowed.

Potential Health Effects

Primary Routes of Entry:	Skin Contact, Eye Contact, Ingestion, Inhalation
Medical Conditions Aggravated by Exposure:	Skin disorders, Respiratory disorders, Eye disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation
For Component: Sodium hydroxide
Corrosive with symptoms of coughing, burning, ulceration, and pain.

Skin
Acute Skin
For Component: Sodium hydroxide
Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage.

Eye

Acute Eye
For Component: Sodium hydroxide
Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

Ingestion
Acute Ingestion
For Component: Sodium hydroxide
Harmful if swallowed. Corrosive to the digestive tract with symptoms of burning and ulceration.

General Effects of Exposure
Chronic Effects of Exposure
For Product: CAUSTIC SODA SOLUTION (50%)
Repeated or prolonged overexposure may cause effects as noted under acute health effects.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous Components

Weight %	Components	CAS-No.
50%	Sodium hydroxide	1310-73-2

4. First Aid Measures

Eye Contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call a physician immediately.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Immediately remove contaminated clothing and shoes. Call a physician immediately. Wash clothing and shoes before reuse.

Inhalation
If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration using a pocket mask type resuscitator. Call a physician immediately.

Ingestion
Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Never give anything by mouth to an unconscious person.

5. Fire-Fighting Measures

Suitable Extinguishing Media: carbon dioxide (CO_2), foam, dry chemical

Special Fire Fighting Procedures
Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

Unusual Fire/Explosion Hazards

Water runoff from fire fighting may be corrosive. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Contact with metals liberates flammable gas.

6. Accidental release measures

Spill and Leak Procedures
Cleanup personnel must use appropriate personal protective equipment. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems. Decontaminant/Neutralizer: Dilute hydrochloric acid solution. Wash spill area with water. Collect wash water for approved disposal.

7. Handling and Storage

Storage Period
Not Established

Handling/Storage Precautions
Do not breathe vapours or spray mist. Do not get on skin or clothing. Do not get in eyes. Do not taste or swallow. Use only with adequate ventilation/personal protection. Wash thoroughly after handling. Keep container closed when not in use.

Further Info on Storage Conditions
Material can be stored safely at ambient temperatures. Do not expose to direct sunlight. Protect from freezing. This product is corrosive to metal(s). Avoid contact with moisture/water. Product can react with water.

8. Exposure Controls / Personal Protection

Sodium hydroxide (1310-73-2)
US. ACGIH Threshold Limit Values
Ceiling Limit Value: 2 mg/m3
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
PEL: 2 mg/m3

Industrial Hygiene/Ventilation Measures
General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate airborne concentration standards/guidelines.

Respiratory Protection
In case of insufficient ventilation wear suitable respiratory equipment.

Hand Protection
Permeation resistant gloves.

Eye Protection
Chemical resistant goggles must be worn., Chemical safety goggles in combination with a full face shield if a splash hazard exists.

Skin and body protection

Permeation resistant clothing and foot protection.

Additional Protective Measures
Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Emergency showers and eye wash stations should be available.

9. Physical and chemical properties

Form:	liquid
Color:	Clear, Opaque
Odor:	Odorless
pH:	14
Freezing Point:	12 °C (53.6 °F)
Boiling Point/Range:	140 °C (284 °F)
Flash Point:	Not applicable (water based product)
Vapor Pressure:	13 mmHg @ 15.56 °C (60 °F)
Specific Gravity:	1.53 @ 15.56 °C (60 °F)
Solubility in Water:	Soluble

10. Stability and Reactivity

Hazardous Reactions
Hazardous polymerization does not occur.

Stability
Stable

Materials to avoid
Combustible material, Acids, Halogenated compounds, Halogens, metals, Oxidizing agents, Peroxides, Organic nitro compounds

Conditions to avoid
Avoid contact with moisture / water. Do not expose to direct sunlight. Protect from freezing.

Hazardous decomposition products
By Fire and Thermal Decomposition: sodium oxides, other potentially toxic fumes
Other Decomposition Products: Hydrogen;

11. Toxicological Information

Toxicity Data for Sodium hydroxide
Acute Oral Toxicity
LD50: 140 - 340 mg/kg (Rat)

Acute dermal toxicity
LD50: 1,350 mg/kg (rabbit)

Skin Irritation
rabbit, Corrosive

Eye Irritation

rabbit, Corrosive

Mutagenicity
Genetic Toxicity in Vitro:
Ames: negative (Salmonella typhimurium)
Positive and negative results were seen in various in vitro studies.
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (mouse, Male/Female, intraperitoneal)

12. Ecological Information

Ecological Data for Sodium hydroxide
Acute and Prolonged Toxicity to Fish
LC50: 45.4 mg/L (50 %, pH 8) (Rainbow (Donaldson)Trout (Oncorhynchus mykiss), 96 hrs)

Acute Toxicity to Aquatic Invertebrates
LC100: 156 mg/L (pH 9.1 - 9.5) (Water flea (Daphnia magna))

Toxicity to Aquatic Plants
The freshwater algae are destroyed at a pH of >8.5.

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Empty Container Precautions
Recondition or dispose of empty container in accordance with governmental regulations. Do not reuse empty container without proper cleaning. Label precautions also apply to this container when empty.

14. Transportation information

Land transport (DOT)

Proper Shipping Name:	Sodium hydroxide solution
Hazard Class or Division:	8
UN/NA Number:	UN1824
Packaging Group:	II
Hazard Label(s):	Corrosive

RSPA/DOT Regulated Components:
Sodium hydroxide

Reportable Quantity: 2,000 lb

Sea transport (IMDG)

Proper Shipping Name:	SODIUM HYDROXIDE SOLUTION
Hazard Class or Division:	8
UN-No:	UN1824
Packaging Group:	II

Hazard Label(s): Corrosive

Air transport (ICAO/IATA)

Proper Shipping Name:	Sodium hydroxide solution
Hazard Class or Division:	8
UN-No:	UN1824
Packaging Group:	II
Hazard Label(s):	Corrosive

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components	
Sodium hydroxide	Reportable quantity: 1,000 lbs

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Reactivity Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components
None

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
When discarded in its purchased form, this product meets the criteria of corrosivity, and should be managed as a hazardous waste (EPA Hazardous Waste Number D002). (40 CFR 261.20-24)

State Right-To-Know Information
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight %	Components	CAS-No.
50%	Sodium hydroxide	1310-73-2
50%	Water	7732-18-5

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight %	Components	CAS-No.

50%	Sodium hydroxide	1310-73-2

California Prop. 65:
To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other Information

NFPA 704M Rating

Health	3
Flammability	0
Reactivity	2
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	3*
Flammability	0
Physical Hazard	2

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person:	Product Safety Department
Telephone:	(412) 777-2835
MSDS Number:	R307100
Version Date:	06/26/2007
Report Version:	1.12

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of Bayer MaterialScience LLC. The information in this MSDS relates only to the specific material designated herein. Bayer MaterialScience LLC assumes no legal responsibility for use of or reliance upon the information in this MSDS.

Material Safety Data Sheet
Gaseous Hydrogen

Section 1 : PRODUCT AND COMPANY IDENTIFICATION
Section 2 : COMPOSITION/ INGREDIENT INFORMATION
Section 3 : HAZARD IDENTIFICATION
Section 4 : FIRST AID MEASURES
Section 5 : FIRE FIGHTING MEASURES
Section 6 : ACCIDENTAL RELEASE MEASURES
Section 7 : HANDLING AND STORAGE
Section 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION
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Section 10 : STABILITY AND REACTIVITY
Section 11 : TOXICOLOGICAL INFORMATION
Section 13 : DISPOSAL CONSIDERATIONS
Section 14 : TRANSPORT INFORMATION
Section 15 : REGULATORY INFORMATION
Section 16 : OTHER INFORMATION

Section 1 : PRODUCT AND COMPANY IDENTIFICATION

Product name: Hydrogen (Gaseous),

Supplier/ Manufacturer: Universal Industrial Gases, Inc.
2200 Northwood Avenue, Suite 3
Easton, PA 18045-2239 USA
(610) 559-7967.

GUIDE 115

Emergency phone: (610) 559-7967.

Section 2 : COMPOSITION/ INGREDIENT INFORMATION

C.A.S.	CONCENTRATION %	Ingredient Name	OSHA PEL	ACGIH TLV	OSHA STEL
1333-74-0	Typically > 99.99	HYDROGEN	NONE	Simple asphyxiant	NONE

Section 3 : HAZARD IDENTIFICATION

Emergency Overview: Hydrogen gas is colorless, odorless and flammable. It forms flammable and explosive mixtures with air over a wide range of concentrations.

The chief physical hazard associated with releases of the gas is asphyxiation by displacement of air and hence, oxygen. Hydrogen presents a serious fire hazard when accidentally released. Emergency personnel must practice extreme caution when approaching hydrogen releases **hydrogen burns with an almost invisible blue flame** which can cause very localized heating and explosion or rupture of pressure vessels.

It is non-toxic. The primary health hazard is asphyxiation by displacement of oxygen.

Route of entry: Inhalation, skin and eye contact.

Effects of acute exposure

Eye contact: No adverse effects expected.

Skin contact: No adverse effects expected. .

Inhalation: Asphyxiant.
May cause dizziness, ringing in ears
Can cause nausea, vomiting.
May result in unconsciousness.
May cause excitation, excess salivation, rapid breathing.
May cause headaches and drowsiness.
May cause stinging of the nose and throat.

Ingestion: Not a likely route of exposure.

Effects of chronic exposure: None known - none expected..

Section 4 : FIRST AID MEASURES

Skin contact: None required.

Eye contact: None required.

Inhalation: **RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus should be worn. IN ADDITION, RESCUERS MUST BE MADE AWARE OF HIGH POTENTIAL FOR FIRE AND EXPLOSION.**

Remove victim(s) to fresh air, as quickly as possible. If not

	breathing qualified personnel should administer artificial respiration. Get medical attention. IKeep person warm and at rest.
Ingestion:	No first aid should be needed. Not considered a potential route of exposure. Product is a gas..

Section 5 : FIRE FIGHTING MEASURES

Flammability:	Flammable over wide range of concentrations in air.
Conditions of flammability:	Contact with open flames or electrostatic discharge. .
Extinguishing media:	Carbon dioxide, regular dry chemical, fine water mist. .
Special procedures:	Self-contained breathing apparatus required. Firefighters should wear the usual protective gear. Cool fire exposed containers with water spray from greatest possible distance. Remove containers from fire area if without risk. Personnel should be evacuated, if necessary, to upwind area. Unless and until flow of gas can be cut off, let the fire burn. Continue to cool containers until well after leak is stopped and fire is extinguished. Recognize that hydrogen gas is very light and rises rapidly in air, if gas is not burning, it may collect in the upper levels of structures, creating an explosion hazard.
Auto-ignition temperature:	1058 °F (570 °C).
Flash point (°C), method:	Not applicable.
Lower flammability limit (% vol):	4.0%
Upper flammability limit (% vol):	75%
Explosion Data	
Sensitivity to mechanical impact:	Avoid impact against container.
Explosive power:	Closed containers may rupture or explode due to pressure build-up when exposed to extreme heat. Cylinders are equipped with temperature and pressure relief devices but may still rupture under fire conditions.

Section 6 : ACCIDENTAL RELEASE MEASURES

Leak/Spill: Evacuate all non-essential personnel.
Stop leak without risk.
Wear gloves and goggles
Use a self-contained breathing apparatus.
Ventilate area. Hydrogen rises and disburses rapidly. I

Section 7 : HANDLING AND STORAGE

Handling procedures and equipment: Protect system components against physical damage.
Use adequate ventilation.
Avoid inhalation.
Never work on a pressurized system.
If there is a leak, close the upstream valve, blow down the system by venting to a safe place, then repair the leak.

Storage requirements: Use storage containers, piping, valves and fittings designed for storage and distribution of Gaseous Hydrogen. Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Post "No Smoking or Open Flames" signs in use and storage areas. Electrical equipment in storage areas must meet codes for Class 1 hazardous areas and be explosion proof.

Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place (where provided) until cylinder is placed into service and after it is taken out of service.

Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment. Piped systems must be grounded. Use soapy water for leak checks, use no open flames around hydrogen systems.

After use, close main cylinder valve. Replace valve protection cap (where provided). Mark empty cylinders "EMPTY".

Section 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Precautionary Measures

Gloves/Type: Wear appropriate gloves.

Respiratory/Type: None required in normal use, only in confined spaces. .

Eye/Type: As per OSHA29 CFR 1910.133 and local regulations.

Footwear/Type: Safety boots per local regulations.

Clothing/Type: Wear adequate protective clothes.

Other/Type: As per OSHA29 CFR 1910.133 and local regulations

Ventilation requirements: Mechanical ventilation is satisfactory. Ensure oxygen concentration remains above 19.5% and Carbon Dioxide concentration does not exceed 5000 ppm,
Local exhaust at points of emission preferred.

Exposure limit of material Simple asphyxiant.

Section 9 : PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Gas

Appearance & odor: Colorless, odorless gas.

Odor threshold (PPM): Odorless.

Vapor pressure : Gas@ 70°F (21°C)

Vapor sp. gravity (air=1): 0.069 @ 70°F (21°C)

Boiling point : -252.8°C (760 mmHg)
-423.0°F

Freezing point : -259°C
-434.6°F

Solubility in water (%): Slight.

Section 10 : STABILITY AND REACTIVITY

Chemical stability: Product is stable.

Conditions of reactivity: Heat

Hazardous polymerization: Will not occur.

Incompatible substances: Oxidizing materials (oxygen, chlorine, bromine, chlorine bromide, nitrogen trifluoride)
Metal oxides, metal salts, halo carbons.

Hazardous decomposition products: None.

Section 11 : TOXICOLOGICAL INFORMATION

LD50 of product, species & route: Simple asphysiant.

LC50 of product, species & route: Simple asphysiant..

Section 13 : DISPOSAL CONSIDERATIONS

Waste disposal: Gas will dissipate in air. Cylinders should be returned in the original shipping container, properly labeled, with residual product, valve outlet plugs or caps secured and valve protection cap in place.

Section 14 : TRANSPORT INFORMATION

DOT/ TDG classification:

For cylinder shipments:
Hydrogen, compressed
UN1049
Class 2.1(Flammable Gas).

115

North American Emergency Response Guidebook Number:

Section 15 : REGULATORY INFORMATION

WHMIS classification:

A, B1

DSL status: Appears on DSL.

Section 16 : OTHER INFORMATION

Definitions and other useful data:

CAS #: The Chemical Abstract Service Number which uniquely identifies each constituent.

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - The same value as a TLV, except it is enforceable by OSHA.

IDLH - Immediately Dangerous to Life and Health - A concentration from which one can escape within 30-minutes without suffering permanent injury.

NATIONAL FIRE PROTECTION ASSOCIATION:
Health Hazard Rating Scale (Blue):
0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials);
1 (materials that on exposure under fire conditions could cause irritation or minor residual injury);
2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury);
3 (materials that can on short exposure could cause serious temporary or residual injury);
4 (materials that under very short exposure could cause death or major residual injury).
Flammability Hazard Rating Scale (Red):
0 (minimal hazard);
1 (materials that require substantial pre-heating before burning);
2 (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]);
3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]);
4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F].
Reactivity Hazard Rating Scale(Yellow):

0 (normally stable);
1 (material that can become unstable at elevated temperatures or which can react slightly with water);
2 (materials that are unstable but do not detonate or which can react violently with water);
3 (materials that can detonate when initiated or which can react explosively with water);
4 (materials that can detonate at normal temperatures or pressures).

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms:
LD50 -Lethal Dose (solids & liquids) which kills 50% of the exposed animals;
LC50 - Lethal Concentration (gases) which kills 50% of the exposed animals;
ppm concentration expressed in parts of material per million parts of air or water;
mg/m3 concentration expressed in weight of substance per volume of air;
mg/kg quantity of material, by weight.

REGULATORY INFORMATION:

EPA is the U.S. Environmental Protection Agency.

WHMIS is the Canadian Workplace Hazardous Materials Information System.

DOT and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively, which assign DOT and **TDG** (Transportation of Dangerous Goods) identification numbers, hazard classifications, and proper shipping name and shipping label information.This material is hazardous as defined by 49 CFR 172.101 of the US Department of Transportation and Dangerous Goods as defined by Transport Canada Transportation of Dangerous Goods Regularions.

USE OF THIS INFORMATION:

Universal Industrial Gases, Inc. offers this information to customers, employees, contractors, and the general public to promote the safe use of this product through awareness of product hazards and safety information. Customers and others who use or transport or sell this product to others should: 1) Disseminate this information internally to all workplace areas, employees, agents and contractors likely to encounter this product; 2) Provide supplemental hazards awareness, safety information, operation and maintenance procedures to the workplace areas and employees, agents and contractors likely to encounter this product; 3) Furnish this information to all their customers who purchase this product; and 4) Ask each purchaser or user of the product to notify its employees and customers of the product hazards and safety information.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

Universal Industrial Gases, Inc. has taken reasonable care in preparing this document, however, since the use of this information and the conditions of use of the product are not within the control of Universal Industrial Gases, Inc., it is the user's obligation to determine the conditions of safe use of this product. The information in this document is offered with no warranties or representations as to accuracy or completeness and it is the responsibility of each individual to determine the suitability of the information for their particular purpose(s).

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Material Data Safety Sheet (MSDS): HYDROCHLORIC ACID

1. Product Identification	7. Handling and Storage
2. Composition	8. Exposure Controls/Personal Protection
3. Hazards Identification	9. Physical and Chemical Properties
4. First Aid Measures	10. Stability and Reactivity
5. Fire Fighting Measures	11. Toxicological Information
6. Accidental Release Measures	12. Ecological Information
	13. Disposal Considerations
	16. Other Information

Note: This information sheet has been re-formatted for better clarity by the Department of Earth Sciences.
Some of the data such as information on shipping and weapons treaties were intentionally left out. If you want to look at the complete MSDS, you can either check one of the hardcopy versions in the Department, contact the manufacturer, or check one of the various Web-based databases such as those compiled by BU's Office of Environmental Health & Safety (www.bu.edu/ehs/msds/index.htm).
Return to

1. Product Identification

MSDS Name: **Hydrochloric Acid**, Reagent ACS

Chlorohydric acid, hydrogen chloride, muriatic acid, spirits of salt.
Company Identification: Acros Organics N.V.
One Reagent Lane
Fairlawn, NJ 07410
For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

2. Composition/Information on Ingredients

CAS#	Chemical Name	%	EINECS#
7647-01-0	Hydrochloric acid, reagent ACS	37%	231-595-7
7732-18-5	Water	Balance	231-791-2

Hazard Symbols: C
Risk Phrases: 34 37

3. Hazards Identification

Emergency Overview

EMERGENCY OVERVIEW
Appearance: Clear, colorless to faintly yellow.
Danger! Corrosive. Sensitizer. Causes eye and skin burns. May cause severe respiratory and digestive tract irritation with possible
burns.
Target Organs: None.

Potential Health Effects

Eye:
May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns. May cause painful sensitization to light. May cause conjunctivitis.

Skin:
May be absorbed through the skin in harmful amounts. Contact with liquid is corrosive and causes severe burns and ulceration. May cause photosensitization in certain individuals.

Ingestion:
May cause circulatory system failure. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.

Inhalation:
Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances.

Chronic:
Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. May cause conjunctivitis and photosensitization.

---

4. First Aid Measures

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.
Skin:
Get medical aid. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.
Ingestion:
Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.
Inhalation:
Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician:
Treat symptomatically and supportively.

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5. Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool.
Extinguishing Media:
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: Not published.
Explosion Limits, Lower: Not available.
Upper: Not available.

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6. Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Large spills may be neutralized with dilute alkaline solutions of soda ash, or lime. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite.

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7. Handling and Storage

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get on skin or in eyes. Do not ingest or inhale.

Storage:
Keep away from heat and flame. Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances.

---

8. Exposure Controls/Personal Protection

Engineering Controls:
Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name ACGIH NIOSH OSHA - Final PELs
Hydrochloric acid, reagent ACS C 5 ppm; C 7.5 mg/m3 50 ppm IDLH C 5 ppm; C 7 mg/m3

OSHA Vacated PELs:
Hydrochloric acid, reagent ACS:
No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face
protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:
Wear appropriate protective gloves to prevent skin exposure.
Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

9. Physical and Chemical Properties (Hydrochloric Acid)

Appearance:	Clear, colorless to faintly yellow liquid
Odor:	Strong, pungent
Solubility:	823g/L water at 32F
Density:	1.16-1.19
pH:	1.1 (0.1N sol)
% Volatiles by volume @ 21 C (70F):	Not available
Boiling Point:	230 deg F
Melting Point:	-101 deg F
Vapor Density (Air=1):	1.257
Vapor Pressure:	160 mm Hg
Evaporation Rate (Butyl acetate =1):	2.0

Molecular Formula: HCl
Molecular Weight: 36.46

10. Stability and Reactivity

Chemical Stability:

Stable under normal temperatures and pressures.

Conditions to Avoid:

Incompatible materials, light.

Incompatibilities with Other Materials:

Acetate, acetic anhydride, alcohols + hydrogen cyanide, 2-aminoethanol, ammonium hydroxide, calcium carbide, calcium phosphide, cesium acetylene carbide, cesium carbide, chlorosulfonic acid, 1, 1 -difluoroethylene, ethylene diamine, ethyleneimine, fluorine, lithium silicide, magnesium boride, mercuric sulfate, oleum, perchloric acid, potassium

permanganate, b-propiolactone, propylene oxide, rubidum acetylene carbide, rubidum carbide, silver perchlorate + carbon tetrachloride, sodium, sodium hydroxide, sulfuric acid, uranium phosphide, vinyl acetate. Substance polymerizes on contact with aldehydes or epoxides.

Hazardous Decomposition Products:

Hydrogen chloride, chlorine, carbon monoxide, carbon dioxide,
hydrogen gas.

Hazardous Polymerization: May occur.

11. Toxicological Information

RTECS#:

CAS# 7647-01-0: MW4025000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 7647-01-0: Inhalation, mouse: LC50 =1108 ppm/1H; Inhalation, rat: LC50 =3124 ppm/1H; Oral, rabbit: LD50 = 900 mg/kg.

CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg.

Carcinogenicity:

Hydrochloric acid, reagent ACS -

IARC: Group 3 carcinogen

Epidemiology:

No information available.

Teratogenicity:

Embryo or Fetus: Stunted fetus, ihl-rat TCLo=450 mg/m3/1H Specific

Developmental Abnormalities: homeostasis, ihl-rat TCLo=450 mg/m3/1H.

Reproductive Effects:

No information available.

Neurotoxicity:

No information available.

Mutagenicity:

No information available.

Other Studies:

None.

12. Ecological Information

Ecotoxicity:

Trout LC100=10 mg/L/24H Shrimp LC50=100-330 ppm Starfish LC50=100-330mg/L/48H Shore crab LC50=240 mg/L/48H Chronic plant toxicity= 100 ppm

Environmental Fate:

Substance will neutralize soil carbonate-based components.

Physical/Chemical:

No information available.

Other:
None.

13. Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

RCRA D-Series Maximum Concentration of Contaminants: None listed.

RCRA D-Series Chronic Toxicity Reference Levels: None listed.

RCRA F-Series: None listed.
RCRA P-Series: None listed.
RCRA U-Series: None listed

16. Other Information

MSDS Creation Date: 11/09/1995 Revision #4 Date: 4/28/1998

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits

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Martin Marietta Materials

MATERIAL SAFETY DATA SHEET

2710 Wycliff Road
Raleigh, North Carolina 27607
919-781-4550

Effective Date: 1-04
Replaces: 12-1-97

I – PRODUCT AND COMPANY IDENTIFICATION

CHEMICAL NAME	CHEMICAL FORMULA	MOLECULAR WEIGHT
Limestone	Mixture	Not Applicable

TRADE NAME
Crushed Stone

SYNONYMS
Aggregate, Aglime, Barn Lime, Coverstone, Fluing Agent, Flexible Base, Manufactured Sand, Mineral Filler, Screenings

DOT IDENTIFICATION NO.
None

II – COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO	% by weight (approx)	MSHA/OSHA PEL	ACGIH TLV-TWA
Silicon Dioxide*, SiO_2	14808-60-7	0-10	(R) 10 mg/m^3 /(% SiO_2+2)§	(R) 0.05 mg/m^3
Aluminum Oxide, Al_2O_3	1344-28-1	<1	(T) 15 mg/m^3, (R) 5 mg/m^3	#10 mg/m^3
Ferric Oxide, Fe_2O_3	1309-37-1	<1	10 mg/m^3	5 mg/m^3
Magnesium Oxide, MgO	1309-48-4	0-8	15 mg/m^3	10 mg/m^3
Calcium Oxide, CaO	1305-78-8	0-43	5 mg/m^3	2 mg/m^3
Sodium Oxide, Na_2O	1313-59-3	<1	-	2 mg/m^3 as NaOH
Potassium Oxide, K_2O	12136-45-7	<1	-	-
Calcium Carbonate, $CaCO_3$	471-34-1	40-100	(T) 15 mg/m^3, (R) 5 mg/m^3	#10 mg/m^3

*: The composition of SiO_2 may be up to 100% crystalline silica. (R): Respirable (T): Total §: Crystalline silica is normally measured as respirable dust. The OSHA standard also presents a formula for calculation of the PEL based on total dust: 30 mg/m^3/ (% SiO_2+2). #: Particulate matter containing no asbestos and <1% crystalline silica.

III – HAZARDS IDENTIFICATION

Angular gray, white and tan particles ranging in size from powder to boulders. No odor.
Silica containing respirable dust particles may be generated by handling limestone.
Inhalation of excessive particulate matter may cause respiratory problems. Crystalline silica, a component of this product, has been designated as a Group I carcinogen by IARC.

Health Effects: The information below represents an overview of health effects caused by overexposure to one or more components in limestone. The individual effects are described in Section XI.

Primary route(s) of exposure: ■ Inhalation ☐ Skin ☐ Ingestion

EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion. Conjunctivitis may occur.
SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion. Some components of material are also known to cause mild corrosive effects to skin and mucous membranes.

ICF INTERNATIONAL
DA COSTA GWENDOLINE ENVIRONMENTAL

SKIN ABSORPTION:	Not expected to be a significant exposure route.
INGESTION:	Small amounts (a tablespoonful) swallowed during normal handling operations are not likely to cause injury. Ingestion of large amounts may cause gastrointestinal irritation and blockage.
INHALATION:	Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion or corrosive action. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits. Repeated excessive exposure may cause pneumoconiosis, such as silicosis and other respiratory effects.

Notes on Silicosis:

Use of limestone for construction purposes is not believed to cause additional acute toxic effects. Repeated overexposures to respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as 6 months has caused acute silicosis.

Chronic exposure to respirable quartz-containing dust in excess of appropriate exposure limits has caused silicosis, a progressive pneumoconiosis (lung disease). Restrictive and/or obstructive lung function changes may result from chronic exposure. Chronic tobacco smoking may further increase the risk of developing chronic lung problems.

Symptoms of acute silicosis include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain. Acute silicosis is a rapidly progressive, incurable lung disease and is typically fatal.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions. Smoking and obstructive / restrictive lung diseases may also exacerbate the effects of excessive exposure to this product.

IV – FIRST AID MEASURES

EYES:	Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or develops later.
SKIN:	Wash with soap and water. Contact a physician if irritation persists or develops later.
INGESTION:	If person is conscious, give a large quantity of water to induce vomiting; however, never attempt to make an unconscious person drink or vomit. Get medical attention.
INHALATION:	Remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or develops later.

V – FIRE FIGHTING MEASURES

FLASHPOINT	FLAMMABLE LIMITS IN AIR
Not flammable	Not flammable

EXTINGUISHING AGENT

None required

UNUSUAL FIRE AND EXPLOSION HAZARD

Contact with powerful oxidizing agents may cause fire and/or explosions (see Section X of this MSDS).

VI – ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Persons involved in cleaning should first follow the precautions defined in Section VII of the MSDS. Spilled materials, where dust can be generated, may overexpose cleanup personnel to respirable quartz-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry sweep spilled material.

This product is not subject to the reporting requirements of Title III of SARA, 1986, and 40 CFR 372.

VII – HANDLING AND STORAGE

This product is not intended or designed for, and should not be used as an abrasive blasting medium or for foundry applications.
Follow protective controls set forth in Section VIII of this MSDS when handling this product.
Respirable quartz-containing dust may be generated during processing, handling and storage. Do not breathe dust.
Avoid contact with skin and eyes.
Do not store near food or beverages or smoking materials.
Do not stand on piles of materials; it may be unstable.

VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS
Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits. If a person breathes large amounts of this material, move the exposed person to fresh air at once; other measures are usually unnecessary.

Other control measures: Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.

EYE/FACE PROTECTION
Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. If product contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

SKIN PROTECTION
No personal protection recommended.

RESPIRATORY PROTECTION
Respirator Recommendations:

For respirable quartz levels that exceed or are likely to exceed the TLV, a NIOSH-approved 100 series particulate filter respirator must be worn. If respirable quartz levels exceed or are likely to exceed an 8hr-TWA of 0.5 mg/m^3, a NIOSH-approved air purifying, full-face respirator with a 100 series particulate filter must be worn. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements. For additional information contact NIOSH at 1-800-356-4674.

Emergency or planned entry into unknown concentrations or IDLH conditions: Any self-contained breathing apparatus that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions: Any air-purifying, full-face piece respirator with a high-efficiency particulate filter or any appropriate escape-type, self-contained breathing apparatus.

GENERAL HYGIENE CONSIDERATIONS
There are no known hazards associated with this material when used as recommended. Following the guidelines in this MSDS are recognized as good industrial hygiene practices. Avoid breathing dust. Avoid skin and eye contact. Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

IX – PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE AND ODOR Angular gray, white and tan particles ranging in size from powder to boulders. No odor.	SPECIFIC GRAVITY. 2.6 - 2.75
BOILING POINT Not applicable	VAPOR DENSITY IN AIR (AIR = 1) Not Applicable
VAPOR PRESSURE Not applicable	% VOLATILE, BY VOLUME 0%
EVAPORATION RATE 0	SOLUBILITY IN WATER Negligible

X – STABILITY AND REACTIVITY	
STABILITY Stable	CONDITIONS TO AVOID Contact with incompatible materials (see below).
INCOMPATIBILITY (Materials to avoid) Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Silica dissolves in hydrofluoric acid producing a corrosive gas- silicon tetra fluoride.	
HAZARDOUS DECOMPOSITION PRODUCTS Silica containing respirable dust particles may be generated by handling limestone	

XI – TOXICOLOGICAL INFORMATION

This product is a mixture of components. The composition percentages are listed in Section II. Toxicological information for each component is listed below:

Silicon Dioxide: It is comprised of amorphous and crystalline forms of silica. In some batches, crystalline silica may represent up to 100% of silicon dioxide.

Respirable crystalline silica (quartz):
ACGIH TLV= 0.05 mg/m^3
MSHA and OSHA PEL:
Crystalline quartz (respirable): PEL-TWA 10 mg/m^3/ (%SiO_2 + 2).
Crystobalite: Use ½ the value calculated from the count or mass formulae for quartz.
Tridymite: Use ½ the value calculated from the formulae for quartz.

Other Particulates: TLV = 10 mg/m^3 (inhalable/total particulate, not otherwise classified), TLV = 3 mg/m^3 (respirable particulate, not otherwise classified), OSHA PEL = 15 mg/m^3 (total particulate, not otherwise regulated), OSHA PEL = 5 mg/m^3 (respirable particulate, not otherwise regulated)

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate TLVs/PELs. Lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions.

Occupational exposure to free silica is known to produce silicosis, a chronic, disabling lung disease characterized by the formation of silica-containing nodules of scar tissue in the lungs. Simple silicosis, in which the nodules are less than 1 cm in diameter is generally asymptomatic but can be slowly progressive, even in the absence of continued exposure.

Silicosis leads to conditions such as lung fibrosis and reduced pulmonary function. The form and severity in which silicosis manifests itself depends in part on the type and extent of exposure to silica dusts: chronic, accelerated and acute forms are all recognized. In later stages the critical condition may become disabling and potentially fatal. Restrictive and/or obstructive changes in lung function may occur due to exposure. A risk associated with silicosis is development of pulmonary tuberculosis (silico-tuberculosis). Respiratory insufficiencies due to massive fibrosis and reduced pulmonary function, possibly with accompanying heart failure, are other potential causes of death due to silicosis.

Symptoms of Silicosis: Not all individuals with silicosis will exhibit symptoms (signs) of the disease. However, silicosis is progressive, and symptoms can appear at any time, even years after exposures have ceased. Symptoms of silicosis may include (but are not limited to): Shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Respirable dust containing newly broken particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken pieces of silica.

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a casual relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate increased risk of developing lung cancer, a risk that increases with the duration of exposure. Many of these studies of silicosis do not account for lung cancer confounders, especially smoking. In October 1996, an IARC Working group re-assessing crystalline silica, a component of this product, designated crystalline silica as carcinogenic (Group 1). The NTP indicates that crystalline silica is reasonably anticipated to be a carcinogen (Group 2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica. Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as a chemical known to the state to cause cancer or reproductive toxicity.

Aluminum Oxide:
Exposure route: Eyes, skin, inhalation.

Target organs: Eyes, skin, respiratory system.

Acute effect: Animal studies with α-alumina were reported in 1941. This study found that alumina particles well below 40 μm in diameter produced a "nuisance particulate" reaction in animals. Very fine Al_2O_3 powder was not fibrogenic in rats, guinea pigs, or hamsters when inhaled for 6 to 12 months and sacrificed at periods up to 12 months following the last exposure.

Chronic effect/carcinogenicity: Aluminum oxide is not classifiable as a human carcinogen. Epidemiologic surveys have indicated an excess of nonmalignant respiratory disease in workers exposed to aluminum oxide during abrasives production.

Ferric Oxide:
Exposure route: Inhalation.

Target organs: Respiratory system.

Acute effect: Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis. Experimental work in animals exposed by intratracheal injection or by inhalation to iron oxide mixed with less than 5% silica has shown no evidence of fibrosis produced in lung tissue.

Chronic effect/carcinogenicity: It is not generally accepted that inhalation or dermal exposure to iron oxide dust or fume poses a carcinogenic risk to human beings. Not classifiable as to human carcinogen potential.

Magnesium Oxide:
Exposure route: Inhalation, eye/skin contact.

Target organs: Eyes, respiratory system.

Acute effect: Magnesium oxide dust caused slight irritation of the eyes and nose, conjunctivitis, inflammation of the mucous membrane, and coughing up discolored sputum after industrial exposures amongst workers exposed to an unspecified concentration of MgO. Acute toxicity causes nausea, malaise, general depression and paralysis of respiratory, cardiovascular and central nervous system.

Experiments with cats exposed to freshly formed MgO (magnesium ranging from 21 to 156 mg) fumes plus 10% carbon dioxide showed uniform but slight hypothermia. These animals rapidly returned to normal and showed no subsequent ill effect upon cessation of MgO inhalation.

Chronic effect/carcinogenicity: NIOSH indicated that there may be a carcinogenic risk from exposure to MgO dust.

Calcium Oxide:
Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: Direct contact of CaO with tissues, can result in burns and severe irritation because of its high reactivity and alkalinity. Major complaints of workers exposed to lime consist of irritation of the skin and eyes, although inflammation of the respiratory passages, ulceration and perforation of the nasal septum, and even pneumonia has been attributed to inhalation of the dust.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Sodium Oxide:
Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: Corrosive – causes burns, irritation of skin, eyes, respiratory tract, extremely destructive of mucous membranes.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen.

Potassium Oxide:
Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: If inhaled, causes sore throat, cough, burning sensation and shortness of breath. Contact with skin produces pain and blisters. Severe deep burns, redness and pain occur with eye contact. Ingestion of K_2O results in burning sensations, abdominal pain, shock or collapse.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen

Calcium Carbonate:
Exposure route: Inhalation, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: Irritation of the eyes, skin and respiratory system and cough. It has been reported that there may be a silicosis risk when using impure limestone containing 3% to 20% quartz. However, it is claimed that pure calcium carbonate does not cause pneumoconiosis. Adverse health effects have generally not been reported in literature among workers using $CaCO_3$.

Chronic effect/carcinogenicity: Not classifiable as human carcinogen

XII – ECOLOGICAL INFORMATION
No data available

XIII – DISPOSAL CONSIDERATIONS
WASTE DISPOSAL METHOD Collect and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

XIV – TRANSPORT INFORMATION
DOT HAZARD CLASSIFICATION None
PLACARD REQUIRED None
LABEL REQUIRED Label as required by the OSHA Hazard Communication standard {29 CFR 1910.1200(f)}, and applicable state and local regulations.

XV – REGULATORY INFORMATION
Crystalline silica, a component of this product, is on the NTP and IARC carcinogen lists, but not on the OSHA carcinogen list. In October 1996, an IARC Working group re-assessing crystalline silica, a component of this product, designated crystalline silica as a human carcinogen (Group 1 carcinogen). Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as chemical known to the state to cause cancer or reproductive toxicity.

XVI – OTHER INFORMATION
ACGIH: American Conference of Governmental Industrial Hygienists CFR: US Code of Federal Regulations DOT: US Department of Transportation IARC: International Agency for Research on Cancer IDLH: Immediately Dangerous to Life and Health NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services NTP: National Toxicology Program OSHA: Occupational Safety and Health Administration, US Department of Labor PEL: Permissible Exposure Limit SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986 TLV: Threshold Limit Value TWA: Time-weighted Average

FOR FURTHER INFORMATION	CONTACT:	Martin Marietta Aggregates Manager-Safety 2710 Wycliff Road Raleigh, NC 27607 919/781-4550 HOURS; 8 AM – 5 PM (EST)
DATE OF PREPARATION 01/04		

NOTICE: Martin Marietta Materials believes that the information contained on this Material Safety Data Sheet is accurate. The suggested precautions and recommendations are based on recognized good work practices and experience as of the date of publication. They are not necessarily all-inclusive or fully adequate in every circumstance as not all use circumstances can be anticipated. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulation, rules or insurance requirement. However, product must not be used in a manner which could result in harm.

NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE IS MADE

MSDS 3600-002

Magnesium Carbonate, n-Hydrate

1. Product Identification

Synonyms: Magnesium (II) Carbonate, Hydrate; Magnesium carbonate (1:1) hydrate
CAS No.: 546-93-0 (USP: 23389-33-5).
Molecular Weight: Not applicable to mixtures.
Chemical Formula: MgCO3.nH2O
Product Codes: 2432, 2436, 2437

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Magnesium Carbonate	546-93-0	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.

Ingestion:
Magnesium carbonate is a food additive and non-toxic unless ingested in very large quantities. May cause diarrhea.
Skin Contact:
No adverse effects expected. May cause mild irritation and redness.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
If large amounts were swallowed, give water to drink and get medical advice.
Skin Contact:
Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use extinguishing media appropriate for surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
15 mg/m3 total dust, 5 mg/m3 respirable fraction for nuisance dusts.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
White Powder.

Odor:
Odorless.

Solubility:
Negligible (< 0.1%)

Specific Gravity:
2.95

pH:
No information found.

% Volatiles by volume @ 21C (70F):
0
Boiling Point:
No information found.
Melting Point:
No information found.
Vapor Density (Air=1):
Not applicable.
Vapor Pressure (mm Hg):
Not applicable.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Magnesium carbonate reacts with acids to liberate carbon dioxide.
Hazardous Decomposition Products:
Forms magnesium oxide and carbon dioxide when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Formaldehyde.
Conditions to Avoid:
Incompatibles.

---

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Magnesium Carbonate (546-93-0)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Not regulated.

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15. Regulatory Information

```
--------\Chemical Inventory Status - Part 1\--------------------------------
Ingredient                                        TSCA  EC   Japan  Australia
---------------------------------------------- ----  ---  -----  ---------
Magnesium Carbonate (546-93-0)                     Yes  Yes   Yes      Yes

------\Chemical Inventory Status - Part 2\----------------------------------
                                                        --Canada--
Ingredient                                         Korea  DSL   NDSL  Phil.
-----------------------------------------------  -----  ---   ----  -----
Magnesium Carbonate (546-93-0)                      Yes   Yes   No     Yes

\Federal, State & International Regulations - Part 1\----------------
                                          -SARA 302-    ------SARA 313----
Ingredient                              RQ    TPQ     List  Chemical Catg.
---------------------------------------- ---  -----   ----  --------------
Magnesium Carbonate (546-93-0)           No    No      No         No

\Federal, State & International Regulations - Part 2\----------------
                                                      -RCRA-    -TSCA-
Ingredient                                CERCLA      261.33     8(d)
-----------------------------------------  ------     ------    ------
Magnesium Carbonate (546-93-0)            No          No         No

 Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0
Label Hazard Warning:
CAUTION! MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes.
Avoid breathing dust.
Use with adequate ventilation.
Wash thoroughly after handling.
Keep container closed.
Label First Aid:
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes while lifting lower and upper eyelids. Call a physician if irritation persists.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8.
Disclaimer:
****
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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **M0160** * * * * * *Effective Date: 01/19/06* * * * * *Supercedes: 08/10/04*

MAGNESIUM HYDROXIDE

1. Product Identification

Synonyms: Magnesium hydrate; Milk of Magnesia
CAS No.: 1309-42-8
Molecular Weight: 58.32
Chemical Formula: Mg(OH)2
Product Codes: 5984

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Magnesium Hydroxide	1309-42-8	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract. Symptoms may include coughing, sore throat, labored breathing, and chest pain.

Ingestion:
May cause irritation to digestive tract. Excessive amounts of magnesium can cause CNS depression and respiratory paralysis which can be fatal.
Skin Contact:
May cause irritation with redness and pain.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
Persons with impaired kidney function may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.
Eye Contact:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Safety glasses. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
White powder.
Odor:
Odorless.
Solubility:
Practically insoluble in water.
Specific Gravity:
2.36
pH:
9.5-10.5 Aqueous slurry.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
Not applicable.
Melting Point:
ca. 350C (ca. 662F) Decomposes.

Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
No hazardous decomposition products.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Acids, maleic anhydride, phosphorous and potassium.
Conditions to Avoid:
Incompatibles.

11. Toxicological Information

Oral rat LD50: 8500 mg/kg.

\Cancer Lists\

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Magnesium Hydroxide (1309-42-8)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

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15. Regulatory Information

```
\Chemical Inventory Status - Part 1\--------------------------------
 Ingredient                                    TSCA  EC   Japan  Australia
 ---------------------------------------------  ----  ---  -----  --------
 Magnesium Hydroxide (1309-42-8)                Yes  Yes   Yes      Yes

 \Chemical Inventory Status - Part 2\--------------------------------
                                                        --Canada--
 Ingredient                                    Korea  DSL   NDSL  Phil.
 ---------------------------------------------  -----  ---   ----  -----
 Magnesium Hydroxide (1309-42-8)                 Yes   Yes   No     Yes

 \Federal, State & International Regulations - Part 1\----------------
                                          -SARA 302-     ------SARA 313------
 Ingredient                              RQ    TPQ      List  Chemical Catg.
 ---------------------------------------  ---   -----   ----  --------------
 Magnesium Hydroxide (1309-42-8)           No    No      No         No

 \Federal, State & International Regulations - Part 2\----------------
                                                      -RCRA-    -TSCA-
 Ingredient                              CERCLA      261.33     8(d)
 ---------------------------------------  ------      ------    ------
 Magnesium Hydroxide (1309-42-8)          No          No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0
Label Hazard Warning:
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.

Label First Aid:
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 3.
Disclaimer:
****
Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

COCKBURN CEMENT

MATERIAL SAFETY DATA SHEET

Milk of Lime

STATEMENT OF HAZARDOUS NATURE

This product is classified as hazardous according to criteria of Worksafe Australia

Cockburn Cement Limited
Russell Road
Munster
P.O. Box 38
Hamilton Hill
WESTERN AUSTRALIA 6163
Phone: (08) 9411 1000

IDENTIFICATION

Product name:	Milk of Lime
Other names:	Hydrated Lime Slurry, Lime Putty
UN number:	none allocated
Dangerous goods class and subsidiary risk:	none allocated
Hazchem code:	none allocated
Poisons schedule number:	none allocated
Use:	Milk of Lime is used in applications such as: - a neutralising agent in water and sewage treatment. - keeping cyanide solutions alkaline for gold processing. - a binder in mortars and renders.

Physical Description/Properties

Appearance:	White 'milk like' slurry.
Boiling point / melting point:	Not applicable
Vapour pressure:	not applicable

Date of Issue: 6 September 2001
Page: 1 of 4 pages

ICF INTERNATIONAL
DA COSTA GWENDOLINE ENVIRONMENTAL

Specific gravity:	Not applicable
Flashpoint:	not applicable
Flammability limits:	not applicable
Solubility in water:	not applicable

OTHER PROPERTIES

pH:	approximately 12
Other:	Non combustible, not explosive, no odour.

Composition

Chemical Name:	CAS number:	Proportion:
Calcium hydroxide ($Ca[OH]_2$)	1305-62-0	20 - 40 %
Magnesium hydroxide ($Mg[OH]_2$)		1 – 3%
Silicon dioxide (SiO_2)	14808-60-7	0.5 - 2.0%
Aluminium oxide (Al_2O_3)		<0.1 – 0.2%
Iron Oxide (Fe_2O_3)		<0.1 – 0.1%

HEALTH HAZARD INFORMATION

HEALTH EFFECTS

Acute: (effects may occur immediately or shortly after a single exposure)

Swallowed:	Has a caustic reaction and will burn mouth and throat. Irritation of stomach may cause pain and nausea.
Eyes:	Irritating, may result in burns to the eye and eyelids. Permanent damage is possible with prolonged exposure.
Skin:	Irritating, rash and burns or dematitis may occur.
Inhaled:	If dried, powder can burn the mucous membranes of the nose, mouth and throat. Chest discomfort and bronchitis may occur.

FIRST AID

Swallowed:	Do not induce vomiting. Wash mouth and lips with copious amounts of water and give limited amounts of water or milk to drink. Seek urgent medical attention.
Eyes:	Wash from around eyes. Flush with copious water for 10 minutes. Seek medical attention.
Skin:	Quickly but gently wipe material off the skin. Immediately remove all contaminated clothing, including footwear. Wash effected areas thoroughly with plenty of soap and water. If any effects persist, seek medical attention.
Inhaled:	If dried and airborne dust present. leave dusty area, seek medical attention if symptoms do not resolve quickly.
First Aid Facilities:	Eye wash station.
Advice to Doctor:	Contact POISONS INFORMATION CENTRE on (08) 9381 1177 or country 1800 119 244.

PRECAUTIONS FOR USE

Exposure standards Worksafe Australia Exposure Standard:

(dry) Calcium Hydroxide: 5 mg/m^3.

Manufacturers' recommendations

Keep exposure as low as practicable.

If inspirable dust levels from dried product are kept below 5 mg/m^3, health problems such as skin, eye and respiratory irritation will be minimised.

Engineering controls

Avoid generating dust. All work with milk of lime should be carried out in such a way as to minimise exposure and repeated skin contact. Where dust could be generated from drying whilst handling milk of lime, use local mechanical ventilation or extraction in areas where dust could escape into the work environment. \

Personal protection

Skin: Wear loose comfortable protective clothing and impervious boots.
Apply barrier cream to hands or wear gloves (AS 2161).
Wash thoroughly after handling.
Wash work clothes regularly.

Eyes: Tight fitting dust goggles are advised to be worn.

Respiratory: If dust is generated due to drying, wear a class P1 or P2 particulate respirator (AS/NZS 1715 & 1716). Use only respirators that bear the Australian Standards mark and are fitted correctly. Note that persons with facial hair will have difficulty in obtaining a satisfactory face seal. For alternatives see *AS/NZS 1715: Selection and use of respiratory protective devices.*

Flammability: Milk of Lime is not flammable.

SAFE HANDLING INFORMATION

Storage and transport

Milk of Lime should be stored in a suitable tank with mechanical agitation. Store away from strong oxidants or acids. Transportation is usually in bulk road tankers.

Spills and disposal

Spills material may be washed into a drain with sufficient water, preferably recycled.

Fire/explosion hazard

Non-combustible.

Other Information

Milk of Lime is non-combustible. Violent reaction with maleic anhydride, nitroethane, nitromethane, nitroparaffin, nitropropane and phosphorous.

CONTACT POINT

For further information on this product, contact:

Marketing and Technical Services
Cockburn Cement Limited
P.O. Box 38
Hamilton Hill
WESTERN AUSTRALIA 6163
Phone: (08) 9411 1000

Advice Note

The information in this document is believed to be accurate. Please check the currency of this MSDS by contacting **(08) 9411 1000.**

The provision of this information should not be construed as a recommendation to use this product in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Users should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace and in conjunction with other substances or products.

Date of Issue: **01/04/05**

ScienceLab.com
Chemicals & Laboratory Equipment

Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Sodium bisulfite MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium bisulfite

Catalog Codes: SLS3526, SLS1309

CAS#: 7631-90-5

RTECS: VZ2000000

TSCA: TSCA 8(b) inventory: Sodium bisulfite

CI#: Not available.

Synonym: Sulfurous acid, monosodium salt; Sulfurous acid, monosodium salt; Sodium sulhydrate; Sodium hydrogen sulfite; Sodium acid sulfite; Monosodium sulfite; Hydrogen sulfite sodium

Chemical Name: Sodium Bisulfite

Chemical Formula: NaHSO3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium bisulfite	7631-90-5	100

Toxicological Data on Ingredients: Sodium bisulfite: ORAL (LD50): Acute: 2000 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of inhalation (lung irritant).
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to lungs, skin.
Repeated or prolonged exposure to the substance can produce target organs damage.

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Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 5 (mg/m3) from OSHA (PEL) [United States] Inhalation
TWA: 5 (mg/m3) from ACGIH (TLV) [United States] Inhalation
TWA: 5 (mg/m3) [United States] Inhalation
TWA: 5 (mg/m3) [United Kingdom (UK)] Inhalation
TWA: 5 (mg/m3) [Canada] InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Sulfurous. (Slight.)

Taste: Disagreeable.

Molecular Weight: 104.07 g/mole

Color: White. Off-white.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Decomposes.

Critical Temperature: Not available.

Specific Gravity: 1.48 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in hot water.
Soluble in cold water.
Soluble in 3.5 parts cold water.
Soluble in 2 parts boiling water.
Soluble in 70 parts alcohol
Insoluble in liquid chloride, ammonia.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Slowly oxidized to sulfate on exposure to air.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 2000 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.
May cause damage to the following organs: lungs, skin.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May affect genetic material (mutagenic).
May cause cancer based on animal test data. No human data found.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:

Skin: Causes skin irritation.
Eyes: Causes eye irritation.
Inhalation: Can cause respiratory tract irritation with cough, wheezing, and shortness of breath. It can produce anaphylaxis or other hypersensivity reactions in some sensitized individuals.
Ingestion: May be harmful if swallowed. It may cause nausea, vomiting, diarrhea, abdominal pain, gastric hemorrhage. Extremely large amounts may affect behavior/central nervous system and may produce central nervous system stimulation, irritation, seizures and may also cause, cyanosis, respiratory depression, apnea, circulatory disturbances, hypotension and cardiovascular collapse. May cause asthmatic reaction in sensitized individuals.
Chronic Potential Health Effects:
Inhalation: Prolonged or repeated inhalation may cause bronchitis to develop with cough, phlegm, and/or shortness of breath. It can cause an asthma-like allergy or other hypersensivity reactions such as anaphylaxis, angioedema, bronchoconstriction, flushing, diaphoresis, urtiacaria, tachycardia, and hypotension in sensitized individuals. Futures exposures may cause shortness of breath, wheezing, cough, and/or chest tightness.
Skin: Prolonged or repeated skin contact can cause dermatitis.
Ingestion: Prolonged or repeated ingestion may affect the liver, and blood

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Sodium bisulfite
Illinois toxic substances disclosure to employee act: Sodium bisulfite
Illinois chemical safety act: Sodium bisulfite
New York release reporting list: Sodium bisulfite
Pennsylvania RTK: Sodium bisulfite
Minnesota: Sodium bisulfite
Massachusetts RTK: Sodium bisulfite
Massachusetts spill list: Sodium bisulfite
New Jersey: Sodium bisulfite

New Jersey spill list: Sodium bisulfite
Louisiana spill reporting: Sodium bisulfite
California Director's List of Hazardous Substances: Sodium bisulfite
TSCA 8(b) inventory: Sodium bisulfite
TSCA 8(a) PAIR: Sodium bisulfite
TSCA 8(d) H and S data reporting: Sodium bisulfite: Effective date: 1/26/94; Sunset date: 6/30/98
CERCLA: Hazardous substances.: Sodium bisulfite: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R22- Harmful if swallowed.
R31- Contact with acids liberates toxic gas.
S25- Avoid contact with eyes.
S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 12:32 PM

Last Updated: 10/11/2005 12:32 PM

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General Chemical

Material Safety Data Sheet

SODA ASH

A. GENERAL INFORMATION

TRADE NAME (COMMON NAME): SODA ASH	**CAS NUMBER:** 497-19-8
CHEMICAL NAME AND/OR SYNONYM: Sodium Carbonate	
FORMULA: Na_2CO_3	**MOLECULAR WEIGHT:** 105.99
MANUFACTURER/ADDRESS: GENERAL CHEMICAL CORPORATION, 90 East Halsey Road, P.O. Box 389, Parsippany, NJ 07054	

CONTACT:	**PHONE NUMBER:**	**LAST ISSUE DATE:**	**CURRENT ISSUE DATE:**
Manager of Product Safety	(973) 515-1840	August, 1996	May, 2001

B. FIRST AID MEASURES

EMERGENCY PHONE NUMBER: (800) 631-8050

EYES:	Flush with plenty of water for at least 15 minutes and get medical attention.
SKIN:	Wash with plenty of water.
INHALATION:	Remove to fresh air.
INGESTION:	Drink large quantities of water to dilute the material. Do not induce vomiting.
	Get medical attention for irritation, ingestion or discomfort from inhalation.

C. HAZARDS INFORMATION

INHALATION:
Inhalation of product dust may irritate nose, throat, and lungs.

INGESTION:
Although low in toxicity, ingestion can be harmful – consult a physician.
May irritate mouth, esophagus, stomach, etc., LD_{50}(rat): 2.8 gm/kg. See reference (a).

SKIN:
May cause skin irritation from prolonged contact.

EYES:
Can irritate or burn eyes.

PERMISSIBLE CONCENTRATION: AIR (SEE SECTION J)		**BIOLOGICAL**
No TLV established.	Not established	None.

UNUSUAL CHRONIC TOXICITY:

None known.

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C. HAZARDS (Cont.)

FLASH POINT: °C Not flammable OPEN CUP ☐ CLOSED CUP ☐	AUTO IGNITION TEMPERATURE °C NA	FLAMMABLE LIMITS IN AIR (% BY VOL.) LOWER - NA UPPER - NA

UNUSUAL FIRE AND EXPLOSION HAZARDS

None.

D. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED:
NA

FIRE EXTINGUISHING AGENTS TO AVOID:
NA

SPECIAL FIREFIGHTING PRECAUTIONS:
NA

VENTILATION:
Local exhaust if dusty condition prevails.

NORMAL HANDLING:
Avoid eye contact or prolonged skin contact. Avoid breathing dusts. When dissolving, add to water cautiously and with stirring; solutions can get hot.

STORAGE:
Store in a cool, dry area away from acids. Prolonged storage may cause product to cake from atmospheric moisture.

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE QUIPMENT – SECTION E)

Shovel up dry chemical into an empty container with a cover. Flush residue with plenty of water. (See Section I for disposal methods).

SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS: **SIGNAL WORD -** WARNING!

Avoid simultaneous exposure to soda ash and lime dust. In the presence of moisture the two materials combine to form caustic soda (NaOH), which may cause burns.

E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION:

Where required, use a respirator approved by NIOSH for product dusts.

EYES AND FACE:
Wear hard hat (or other head covering) and chemical safety goggles.
Do not wear contact lenses.

HANDS, ARMS, AND BODY:
Wear long-sleeve shirt and trousers, and impervious gloves for routine product use.
Cotton gloves are sufficient for dry product; wear impervious gloves when handling solutions.

OTHER CLOTHING AND EQUIPMENT:

Eyewash is recommended.

F. PHYSICAL DATA

MATERIAL IS AT NORMAL CONDITIONS:		APPEARANCE AND COLOR:
LIQUID ☐ SOLID ☒ GAS ☐ ☐ _____		White powder, Odorless.
BOILING POINT: °C MELTING POINT: 854 °C	SPECIFIC GRAVITY: (H_2O = 1) 2.533	VAPOR DENSITY: (AIR =1) NA
SOLUBILITY IN WATER: (% BY WEIGHT) 17% solution at 20C	pH: 1% solution; pH = 11.3	VAPOR PRESSURE: (mm Hg @ 20°C) ☐ (PSIG) ☐ NA
EVAPORATION RATE: (Butyl acetate=1) ☐ (Ether = 1.0) ☐ NA	% VOLATILES BY VOLUME: (AT 20°C) NA	

G. REACTIVITY DATA

STABILITY:	CONDITIONS TO AVOID:
UNSTABLE ☐ STABLE ☒	None.

INCOMPATIBILITY (MATERIALS TO AVOID):
Contact with acids will release carbon dioxide gas.
When mixed with lime dust and water, corrosive caustic soda may be produced.

HAZARDOUS DECOMPOSITION PRODUCTS:

See above

HAZARDOUS POLYMERIZATION:	CONDITIONS TO AVOID:
MAY OCCUR ☐ WILL NOT OCCUR ☒	None.

H. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

MATERIAL OR COMPONENT/C.A.S. #	WT.%	HAZARD DATA (See Sect. J)
NA		

I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY:	OCTANOL/WATER PARTITION COEFFICIENT
ND	ND

EPA HAZARDOUS SUBSTANCE? (CLEAN WATER ACT SECT. 311) YES ☐ NO ☒ IF SO, REPORTABLE QUANTITY:	40 CFR 116-117

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS):

If permitted by applicable disposal regulations, bury in a sold waste landfill or dissolve and neutralize as follows: Dissolve in water using caution as solution can get hot. Neutralize with acid and flush to sewer with plenty of water. Good ventilation is required during neutralization due to release of CO_2 gas. Neutralized waste may have to be disposed of by an approved contractor.

RCRA STATUS OF UNUSED MATERIAL IF DISCARDERD:	HAZARDOUS WASTE NUMBER: (IF APPLICABLE)	40 CFR 261
Not a hazardous waste.	--	

J. REFERENCES

PERMISSIBLE CONCENTRATIONS REFERENCES:

None.

REGULATORY STANDARDS	DOT CLASSIFICATION: Not regulated.	49 CFR 173

None additional cited.

GENERAL: (a) General Chemical Corporation data, unpublished.

K. ADDITIONAL INFORMATION

This product is not for use as a food or drug additive.

GC-1000

THIS MATERIAL SAFETY DATA SHEET IS OFFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION.

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Material Safety Data Sheet

TSI Incorporated
500 Cardigan Road
Shoreview, MN 55126-3996

24 hour Emergency telephone
CHEMTREC: 1-800-424-9300

Outside US and Canada
Chemtrec: 703-527-3887

Note: CHEMTREC number to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-874-2811) for assistance.

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

TSI Products: 2918043, 2918035

Chemical Product Name	Sodium Chloride (Salt)
Chemical Family	Alkali Metal/Halide
Chemical Name	Sodium Chloride
INCI Name	SODIUM CHLORIDE
INN Name	sodium chloride
Formula	NaCl
Molecular Weight	58.44
Commercial Name	Pretzel M Salt, Pretzel I Salt, Alberger® Coarse Topping Salt, Alberger Flake Salt, Alberger Special Flake Salt, Alberger Fine Flake Salt, U.S.P. Grade Sodium Chloride, CMF®Evaporated Salt, Food Grade Salt Bricks, Hi-Grade Plus Evaporated Salt, Hi-Grade Evaporated Salt, Fine Blending Evaporated Salt - Untreated, Natural Fine Blending Sea Salt, California Sea Salt® Extra Coarse Topping, California Sea Salt® Topping, Seafood Plain Tablets, Plain Salt Tablets

2. COMPOSITION/INFORMATION ON INGREDIENTS

Description
White crystalline solid

Ingredient Name **CAS Number**	**Exposure Limits**	**Concentration (%)**
Sodium Chloride 7647-14-5		100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

None – GRAS Substance (Generally Recognized As Safe)

Potential Health Effects

Route(s) Of Entry: Ingestion, skin/eye contact, inhalation.

Human Effects and Symptoms of Overexposure:

Acute Inhalation: Irritation of the respiratory tract.

Chronic Inhalation: No applicable information found for chronic system effects.

Acute Skin Contact: Large amounts can cause irritation, and, if applied to damaged skin, absorption can occur with effects similar to those via ingestion.

Chronic Skin Contact: No applicable information found for chronic system effects.

Acute Eye Contact: Irritation with burning and tearing (salt concentrations greater than the normal saline present).

Chronic Eye Contact: No applicable information found for chronic systemic effects.

Acute Ingestion: Intake of large amounts has generally occurred for deliberate reasons: suicide, absorption, and to induce vomiting. The following effects were observed; nausea and vomiting, diarrhea, cramps, restlessness, irritability, dehydration, water retention, nose bleed, gastrointestinal tract damage, fever, sweating, sunken eyes, high blood pressure, muscle weakness, dry mouth and nose, shock, cerebral edema (fluid on brain), pulmonary edema (fluid in lungs), blood cell shrinkage, and brain damage (due to dehydration of brain cells). Death is generally due to cardiovascular collapse or CNS damage. Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

Chronic Ingestion: No applicable information found for chronic systemic effects.

Carcinogenicity
NTP: Not listed as carcinogen or mutagen.
IARC: Not listed as carcinogen or mutagen.
OSHA: Not listed as carcinogen or mutagen.

Medical Conditions Aggravated by Exposure: In some cases of confirmed hypertension, ingestion may result in elevated blood pressure.

4. FIRST AID MEASURES

First Aid for Eyes: For eye contact, flush with water immediately, lifting eyelids occasionally.

First Aid for Skin: Remove clothing from affected area. Wash skin thoroughly. Rinse carefully.

First Aid for Inhalation: If person breathes large quantities, remove to fresh air at once. If breathing stops, apply artificial respiration immediately.

First Aid for Ingestion: Less than a few grams would not be harmful. For larger quantities drink large amounts of water or milk.

5. FIRE AND MEASURES

Flash Point: N/A

Extinguishing Media: N/A. This product is nonflammable.

Special Fire Fighting Procedures: N/A

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Contain spills to prevent contamination of water supply or sanitary sewer system. Vacuum or sweep into containers for proper disposal.

7. HANDLING AND STORAGE

Storage Temperature (min./max.): Avoid humid or wet conditions as product will cake and become hard.
Special Sensitivity: Avoid contact with strong acids.
Handling and Storage Precautions: Becomes hygroscopic at 75% relative humidity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection Requirements: Eyeglasses or goggles should be worn in dusty areas.

Skin Protection Requirements: Protective clothing may be worn in dusty areas, but is generally not required.
Respiratory/Ventilation Requirements: NIOSH/MSHA approved respirator for particulates.
Exposure Limits: Not listed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: White crystalline solid with slight halogen odor.

Color: White to opaque.

Odor: Halogen odor when heated.

Boiling Point (760mm Hg)(°C): 1465

Melting Point/Freezing Point (°C): 801

pH: 6.7 – 10.0

Solubility in Water (g/cc)(%): 26.4

Specific Gravity (H_2O = 1): 2.16

Bulk Density (lbs./ft³): 35-83

% Volatile by Weight: N/A

Vapor Pressure (mm Hg/747°C): 2.4

Vapor Density (Air=1): N/A

10. REACTIVITY

Stability: Stable
Incompatibilities: Avoid contact with strong acids. Becomes corrosive to metals when wet.
Decomposition Products: May evolve chlorine gas when in contact with strong acids.

11. TOXICOLOGICAL INFORMATION

Description: Not listed.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not listed.

Environmental Degradation: Not listed.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Follow applicable Federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

D.O.T. Shipping Name: Not listed.
Technical Shipping Name: Not listed.

D.O.T. Hazard Class: Not listed.
U.N./N.A. Number: Not listed.
Product Rq (lbs.): N/A

D.O.T. Label: Not listed.
D.O.T. Placard: N/A
Freight Class Bulk: N/A
Freight Class Package: N/A
Product Label: N/A

15. REGULATORY INFORMATION

OSHA Status: Not listed.

TSCA Status: Listed as non-hazardous.

CERCLA Reportable Quantity SARA Title III

Section 302 Extremely Hazardous Substances: Not listed.

Section 311/312 Hazard Categories: Not listed.

Section 313 Toxic Chemicals: Not listed.

RCRA Status: Not listed.

EINECS Number: 231-598-3

ENCS Number: 1-236

ECL Serial Number: KE-31387

SWISS Number: G-2580

HMIS Rating: 1 0 0 A

State Regulatory Information

Company Name/Cas Number Concentration State Code

N/A

16. OTHER INFORMATION

Reason for Issue: Regulatory compliance.

Disclaimer:
TSI, INC provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. TSI, INC MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATIONS REFERS. ACCORDINGLY, TSI, INC WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM THE USE OF OR RELIANCE UPON THIS INFORMATION.

Cargill Salt

Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Chemical Product Name	Sodium Chloride (Salt)
Chemical Family	Alkali Metal/Halide
Chemical Name	Sodium Chloride
Formula	NaCl
Molecular Weight	58.44
Commercial Name	Diamond Crystal® Halite Winter Melt® Deicing Crystals

Manufacturer
Cargill Incorporated
Salt Division
P. O. Box 5621
Minneapolis, MN 55440

Emergency Telephone Numbers
CHEMTREC (800) 424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

Description
White crystalline solid.

Ingredient Name **CAS Number**	**Exposure Limits**	**Concentration (%)**
Sodium Chloride 7647-14-5		100%

3. HAZARDS INDENTIFICATION

EMERGENCY OVERVIEW

None - GRAS Substance (Generally Recognized As Safe)

Potential Health Effects

Route(s) Of Entry: Ingestion, skin/eye contact, inhalation.

Human Effects and Symptoms of Overexposure:

Acute Inhalation: Irritation of the respiratory tract.

Chronic Inhalation: No applicable information found for chronic systemic effects

Acute Skin Contact: Large amounts can cause irritation and if applied to damaged skin, absorption can occur with effects similar to those via ingestion.

Chronic Skin Contact: No applicable information found for chronic systemic effects.

Acute Eye Contact: Irritation with burning and tearing (salt concentrations greater than the normal saline present).

Chronic Eye Contact: No applicable information found for chronic systemic effects.

Acute Ingestion: Intake of large amounts has generally occurred for deliberate reasons: suicide, absorption, and to induce vomiting. The following effects were observed; nausea and vomiting, diarrhea, cramps, restlessness, irritability, dehydration, water retention, nose bleed, gastrointestinal tract damage, fever, sweating, sunken eyes, high blood pressure, muscle weakness, dry mouth and nose, shock, cerebral (fluid on brain) or pulmonary edema (fluid in lungs), blood cell shrinkage, and brain damage (due to dehydration of brain cells). Death is generally due to cardiovascular collapse or CNS damage. Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

Chronic Ingestion: No applicable information found for chronic systemic effects.

Carcinogenicity
NTP: Not listed as a carcinogen or mutagen.
IARC: Not listed as a carcinogen or mutagen.
OSHA: Not listed as a carcinogen or mutagen.

Medical Conditions Aggravated by Exposure: In some cases of confirmed hypertension, ingestion may result in elevated blood pressure.

4. FIRST AID MEASURES

First Aid For Eyes: For eye contact, flush with water immediately, lifting eyelids occasionally.

First Aid For Skin: Remove clothing from affected area. Wash skin thoroughly. Rinse carefully.

First Aid For Inhalation: If person breathes large quantities, remove to fresh air at once. If breathing stops, apply artificial respiration immediately.

First Aid For Ingestion: Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

5. FIRE AND MEASURES

Flash Point: N/A

Extinguishing Media: N/A. This product is nonflammable.

Special Fire Fighting Procedures: N/A.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Contain spills to prevent contamination of water supply or sanitary sewer system. Vacuum or sweep into containers for proper disposal.

7. HANDLING AND STORAGE

Storage Temperature (min./max.): Avoid humid or wet conditions as product will cake and become hard.

Special Sensitivity: Avoid contact with strong acids.

Handling and Storage Precautions: Becomes hygroscopic at 70% Relative Humidity

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection Requirements: Eyeglasses or goggles should be worn in dusty areas.

Skin Protection Requirements: Protective clothing may be worn in dusty areas, but is generally not required.

Respiratory/Ventilation Requirements: NIOSH/MSHA approved respirator for particulates.

Exposure Limits: Not listed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: White crystalline solid with slight halogen odor.

Color: White crystalline solid

Odor: Halogen odor

Boiling Point (760mm Hg) (^{0}C): 760 mm Hg. 1465 degrees C.

Melt Point/Freeze Point (^{0}C): 801 degrees C.

PH: 6.7 - 7.3

Solubility In Water (g/cc, %): 26.4%

Specific Gravity (H_20=1): 2.16 (H_2O)

Bulk Density: 53-83 Lbs/Ft^3

% Volatile By Weight: N/A

Vapor Pressure (mm Hg/747^{0}C): = 2.4

Vapor Density (Air=1): (Air=1) N/A

10. REACTIVITY

Stability: Stable

Incompatibilities: Avoid contact with strong acids. Becomes corrosive to metals when wet.

Decomposition Products: May evolve chlorine gas when in contact with strong acids.

11. TOXICOLOGICAL INFORMATION

Description: Not Listed

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not Listed.

Environmental Degradation: Not Listed.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Follow applicable Federal, state and local regulations.

14. TRANSPORTATION INFORMATION

D.O.T. Shipping Name: Not Listed

Technical Shipping Name: Not Listed

D.O.T Hazard Class: Not Listed

U.N./N.A. Number: Not Listed

Product Rq (lbs.): N/A

D.O.T. Label: Not Listed

D.O.T. Placard: N/A

Freight Class Bulk: N/A

Freight Class Package: N/A

Product Label: N/A

15. REGULATORY INFORMATION

OSHA Status: Not Listed

TSCA Status: Listed as non hazardous.

Cercla reportable Quantity
SARA Title III
Section 302 Extremely
Hazardous Substances: Not Listed

Section 311/312
Hazard categories: Not Listed

Section 313
Toxic Chemicals: Not Listed

RCRA Status: Not Listed

State Regulatory Information

Component Name /CAS Number	Concentration	State-Code
N/A		

16. OTHER INFORMATION

Reason For Issue: Regulatory Compliance
Prepared By: Steve Karl
Approved By: Dave Merriweather
Title: Director-Quality Administration
Approval Date: February 2005
Supersedes Date: September 2002
MSDS Number: ND2

Disclaimer: All statements, technical information and recommendations contained herein are, the best of our knowledge, reliable and accurate; however no warranty, either expressed or implied is made with respect thereto, nor will any liability be assumed for damages resultant from the use of the material described.

It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations. It is also the responsibility of the user to maintain a safe workplace. The user should consider the health hazards and safety information provided herein as a guide and should take the necessary steps to instruct employees and to develop work practice procedures to ensure a safe work environment.

This information is not intended as a license to operate under, or a recommendation to practice or infringe upon any patent of this Company or others covering any process, composition of matter or use.

12.5% SODIUM HYPOCHLORITE SOLUTION

Material Safety Data Sheet

Emergency 24 Hour Telephone: CHEMTREC 800.424.9300

Corporate Headquarters: Hasa Inc.
23119 Drayton Street
Saugus, California 91350
Telephone • 661.259.5848
Fax • 661.259.1538

IDENTIFICATION OF PRODUCT	
Product Name:	HASA 12.5% Sodium Hypochlorite Solution
Common Chemical Names:	Hypochlorite solution sodium salt, sodium hypochlorite
Chemical Names of Ingredients [>1.0% by weight]:	Sodium hypochlorite
Chemical Family:	Inorganic halogen compound
CAS Registry Number:	7681-52-9
Empirical Formula:	NaOCl
Molecular Weight:	74.45

PHYSICAL AND CHEMICAL PROPERTIES			
Vapor Pressure:	12.1 mm Hg at 20ºC [12.5% solution]	**Flash Point:**	Not Applicable.
Weight/Gallon:	10.0 lbs. (4.54 kg.)	**pH:**	11.2 – 11.4
Density [liquid]:	1.20 at 20ºC (68ºF)	**Odor:**	Slight Bleach
Bulk Density:	Not Applicable.	**Boiling Point:**	Decomposes
Melting Point:	Not Applicable.	**Freezing Point:**	-20° Fahrenheit
Physical State:	Liquid Solution	**Color:**	Straw Yellow
Solubility in Water:	Complete	**Stability:**	Stable

PHYSICAL HAZARDS	
Potential for Fire:	None. Nonflammable and combustible liquid.
Potential for Explosion:	None. Nonflammable and combustible liquid.
Reactivity:	Violent reactions with amines, ammonium aldehyde, ammonium carbonate, aziridine, methanol, phenylacetonitrile, ammonium nitrate, ammonium oxylate, ammonium phosphate, cellulose, ethylene imine. Do not mix acids, aqua ammonia, or other organic or inorganic chemicals with this product.

HEALTH HAZARDS	
Signs and Symptoms of Exposure:	Eyes and skin irritation. Chemical burns to broken skin.
Medical Conditions Aggravated by Exposure:	No data available.
Oral [ingestion] LD_{50}:	No data available.
Dermal [skin absorption] LD_{50}:	No data available.
Inhalation [breathing] LC_{50}:	No data available.
Eye Irritation:	Irritating. May cause eye damage.
Skin Irritation:	Mild irritation. Not considered to be a skin sensitizer.
OSHA PEL:	None established.
ACGIH TLV/TWA:	None established.

POTENTIAL ROUTE [S] OF ENTRY	
Inhalation [Breathing]:	Unlikely to occur. Vapor may cause irritation to upper respiratory tract.
Dermal [Skin]:	Contact with broken skin may cause burning, blistering, and tissue destruction if not washed off immediately.
Eyes:	Corrosive to eyes.
Ingestion:	Not anticipated. May cause severe chemical burns to esophagus and to stomach lining.

CARCINOGENIC [CANCER POTENTIAL] INFORMATION	
National Toxicological Program [NTP] ***Sixth Annual Report on Carcinogens:***	Not listed.
International Agency for Research on Cancer [IARC] Monographs**, V. 1-53, Supps. 1-8:**	Not listed.
Listed by Federal OSHA as Carcinogens:	Not listed.

Safe Drinking Water and Toxic Enforcement Act of 1986 **[Proposition 65, California only]:**

Small quantities – less than 100 ppm (parts per million) – of impurities, including bromates, may be found in all chlorinating products, including this product. Bromates are derived from bromides, which are present in sodium chloride (table salt) from which chlorine is manufactured. Additional small quantities of bromates may be generated during the disinfection process. Bromates are known by the State of California to cause cancer when administered by the oral (drinking or ingesting) route. Read and follow label directions and use care when handling or using this product. The US Environmental Protection Agency has established a maximum contaminant level (MCL) for bromates in drinking water at 10 ppb (parts per billion). Application of this product in accordance with label directions at use dilution will not exceed this level.

This warning is provided pursuant to Proposition 65, the Safe Drinking Water and Toxic Enforcement act of 1986, Chapter 6.6 of the California Health and Safety Code, which requires the Governor of California to publish a list of chemicals "known to the state to cause cancer or reproductive toxicity." This list is compiled in accordance with the procedures established under the proposition, and can be obtained on the internet from California's Office of Environmental Health Hazard Assessment at http://www.oehha.ca.gov. There are over 700 chemical substances on this list.

GENERAL PRECAUTIONS FOR SAFE USE AND HANDLING
Open containers carefully. Sodium hypochlorite solutions are packaged with vented closures. Do not use containers which are leaking or show evidence of having leaked. Mix only with water. Do not mix with other chemicals. Use clean, dry utensils when mixing. Do not discharge this product or mixtures of this product into lakes, streams, ponds, bays, estuaries, or the ocean. Sodium hypochlorite is toxic to aquatic organisms at very low levels.

PERSONAL PROTECTION AND HYGIENE
Wear goggles or face shield and rubber gloves when handling. Remove and wash contaminated clothing before reuse. Wash hands after handling.

CLEAN-UP OF SPILLS
Store this product in a cool, dry area, away from sunlight and heat to avoid deterioration. In case of spill, flood area where spill has occurred with large quantities of water. With permission from local authorities, diluted product may be flushed to a sanitary sewer. Product may also be absorbed with sand or diatomaceous earth. Absorbed products must be disposed of in accordance with applicable Federal, State, and/or local regulations. Contact HASA, Inc. for guidance.

FIRST AID	
Eye Contact:	Flush with water. Remove contact lenses [if applicable]. Hold eyelids open. Continue flushing with water for 15 minutes. Get prompt medical attention.
Skin Contact:	Wash affected area with water for 15 minutes. Get medical attention.
Ingestion [swallowing]:	Drink large quantities of milk or gelatin solutions. If these are not available drink large quantities of water. DO NOT induce vomiting. DO NOT give vinegar or other acids. Get prompt medical attention.

FEDERAL/STATE LISTS/REGISTRATION/S/REPORTING REQUIREMENTS	
CERCLA Hazardous Substance [Section 1010 [4], P.L. 96-510]:	RQ=100 lbs [80 gallons for 12.5% solution]
Extremely Hazardous Substance [40 CFR 355, Appendix A]:	Not listed.
Pesticide Product 7 U.S.C. 136 et seq.:	Registered as a pesticide product by Federal EPA.
Toxic Substance under TSCA:	Not reported.
Pesticide Product [various State Laws]:	Registered as pesticide product in states where marked.

MATERIAL CLASSIFICATION	
OSHA Hazard Communication Standard, Department of Labor, Occupational Safety and Health Division, 29 CFR 1910.1200:	Irritant

Hazardous Materials Transportation Regulations, Department of Transportation (Federal) 49 CFR 172.101	
Proper Shipping Description [1 gallon or less]:	Consumer Commodity, ORM-D
Proper Shipping Description [greater than 1 gallon]:	Hypochlorite Solutions, 8, UN1791, P.G. III

National Fire Protection Association NFPA 704 [1990]:	2-0-0
BOCA National Fire Prevention Code/National Building Code [1999 editions]:	Irritant
Standard Fire Prevention Code/Standard Building Code [1997 editions]:	Irritant
Uniform Fire Code/Uniform Building Code [1997 editions]:	Irritant
Uniform Fire Code Standards 79-3, Uniform Fire Code, V. II [1997 edition]:	2-0-0

RETURNABLE CONTAINERS
Returnable (deposit) containers must be resealed and the contents drained therefrom prior to return to the distributor or manufacturer for credit. Do not offer leaking or damaged containers for transportation. Call HASA, Inc. or your distributor for instructions.

Please Note: The information contained herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge and belief. NO WARRANTY OR GUARANTEE, expressed or implied, is made regarding the product performance, product stability, or as to any other condition of use, handling, transportation, and storage. Customer use, handling, transportation, and storage may involve additional safety and/or performance considerations. Our technical personnel will be happy to respond to questions regarding safe handling, storage, transportation and use procedures. The safe handling, storage, transportation and use procedures remain the sole responsibility of the customer. No suggestions for handling, storage, transportation or use are intended as or to be construed as recommendations which may infringe on any existing patents or violate any Federal, State, and/or local law and/or regulation, ordinance, standard, etc.. This Material Safety Data Sheet has been prepared by HASA, Inc. staff from test reports and other information available in the public domain.

ScienceLab.com
Chemicals & Laboratory Equipment

Health	1
Fire	1
Reactivity	0
Personal Protection	B

Material Safety Data Sheet
Cellulose MSDS

Section 1: Chemical Product and Company Identification

Product Name: Cellulose

Catalog Codes: SLC4804

CAS#: 9004-34-6

RTECS: FJ5691460

TSCA: TSCA 8(b) inventory: Cellulose

CI#: Not available.

Synonym: Cellulose, Microcrystalline

Chemical Name: Cellulose

Chemical Formula: POLYMER

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Cellulose	9004-34-6	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of eye contact (irritant), of ingestion, of inhalation. Non-irritant for skin.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at

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least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat.
Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Damp cellulose can be a significant fire hazard since it may underto spontaneous combustion.
Fire and explosions may occur from reactions involving pentafluoride, acetic acid and cellulose.
Contact between cellulose and sodium nitrite at elevated temperatures results in vigorous burning from decompositon reaction.

Special Remarks on Explosion Hazards:
Fire and explosions may occur from reactions involving pentafluoride, acetic acid and cellulose.
Contact between cotton and fluorine may result in violent explosion.
Excess dust generation may create explosion hazard.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. If ingested, seek medical advice immediately and show the container or the label.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Gloves (impervious).

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 10 (mg/m3) from ACGIH (TLV) [United States] Inhalation Total.
TWA: 10 (mg/m3) from British Columbia Occupational Exposure Limit [Canada] Inhalation Total.
TWA: 3 from British Columbia Occupational Exposure Limit [Canada] Inhalation Respirable.
TWA: 5 (mg/m3) from OSHA (PEL) [United States] Inhalation Respirable.
TWA: 15 (mg/m3) from OSHA (PEL) [United States] Inhalation Total.
TWA: 10 STEL: 20 (mg/m3) [United Kingdom (UK)] Inhalation Total.
TWA: 4 (mg/m3) [United Kingdom (UK)] Inhalation Respirable.Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance:
Solid. (A polymer consisting of linked glucose units (cellobiose) in unbranched linear chains. It may exist as a fibrous or white crystalline solid. Microcrystalline cellulose consists of rigid rods. It is the main constituent of plant fiber.)

Odor: Odorless.

Taste: Tasteless.

Molecular Weight: Not available.

Color: Off-white.

pH (1% soln/water): Not applicable.

Boiling Point: Decomposes.

Melting Point: 500°C (932°F) - 518 C

Critical Temperature: Not available.

Specific Gravity:
1.27 - 1.61@ 0 C (32 F)(Water = 1)
0.28-.032 (temperature not listed)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water.
Insoluble in organic solvents.
It will swell in dilute alkaline solutions such as sodium hydroxide and will dissolve in caustic alkali with carbon disulfide.
It is soluble in ammoniacal copper hydroxide solution (Schweitzer's reagent) and concentrated zinc chloride solution.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): >5000 mg/kg [Rat].
Acute dermal toxicity (LD50): >2000 mg/kg [Rabbit].
Acute toxicity of the dust (LC50): 5800 mg/m
4 hours [Rat].
3

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:

Slightly hazardous in case of ingestion, of inhalation.
Non-irritant for skin.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: It is not known to cause skin irritation.
Ingestion: Ingestion of large amounts of cellulose may cause digestive tract irritation.
Eyes: Dust may cause mechanical irritation.
To the best of our knowledge, there are no known cases of adverse effects or disease in humans from exposure to cellulose. Health effects from cotton fibers, wood, flax, jute, and hemp are usually due to other substances.
Purified cellulose is known to be essentially inert.
Pure cellulose dust is not known to be irritating or toxic.
Chronic Potential Health Effects:
Chronic inhalation from cellulose-containing fibers can cause byssinosis.
Allergies can develop to cellulose-containing fibers, but these are probably due to plant proteins or other components.
In chronic feeding studies with purified celulose in mice and rats, no significant adverse reactions were seen.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Cellulose
Rhode Island RTK hazardous substances: Cellulose
Pennsylvania RTK: Cellulose
Minnesota: Cellulose

Massachusetts RTK: Cellulose
TSCA 8(b) inventory: Cellulose

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
This product is not classified according
to the EU regulations
Not applicable.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: B

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves (impervious).
Lab coat.
Not applicable.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available

Created: 10/11/2005 11:34 AM

Last Updated: 10/11/2005 11:34 AM

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PUROLITE

MATERIAL SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: PCR532Ca

Manufacturer Name:
The Purolite Company
150 Monument Road
Bala Cynwyd, PA 19004, USA
Tel: +1 610 668 9090; Fax: +1 610 668 8139

Emergency Telephone:
(866) 387-7344
Non-toll free number: 760-602-8703

Supplier:
Purolite International Limited
Llantrisant Business Park
Llantrisant, Wales, UK CF72 8 L
Tel: +44 1443 229334; Fax: +44 1443 227073

Purolite Company Ltd.
Dongmenwai, Chengguan Town. Deqing Co.,
Huzhou City, Zhejiang 313216
Tel: +86 572 842 2908; Fax: +86 572 842 5345

Intended Use: Ion Exchange, Adsorbent, and / or Catalyst

Contact Person:
Ken Shaner, E-mail: kshaner@puroliteusa.com

2 HAZARDS IDENTIFICATION

Emergency Overview
Physical State: Solid (bead)
Color: Not applicable.
Odor: Not applicable.

Low hazard for usual industrial or commercial handling by trained personnel.

Potential Health Effects

Inhalation: Limited inhalation hazard at normal work temperatures.

Eye Contact: May cause temporary eye irritation.

Skin Contact: May be slightly irritating to skin.

Ingestion: Under normal conditions of intended use, this material does not pose a risk to health. However, ingestion may cause irritation and malaise.

Chronic Health Effects: No other specific acute or chronic health impact noted.

Target Organ(s): | Eye | Skin.

Potential Physical / Chemical Effects: This product is not flammable.

OSHA Regulatory Status: This product is not hazardous according to OSHA 29CFR 1910.1200.

Environment: The environmental hazard of the product is considered to be limited.

3 COMPOSITION / INFORMATION ON INGREDIENTS

General Information: The product contains: Polymer.

The components are not hazardous or are below required disclosure limits.

Chemical Name	CAS-No.	Concentration*
Benzene, diethenyl-, polymer with ethenylbenzene and ethenylethylbenzene, sulfonated, calcium salts	71786-43-1	40 - 65%
Water	7732-18-5	35 - 60%

4 FIRST AID MEASURES

Inhalation: No specific first aid measures noted.

Eye Contact: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention if any discomfort continues.

Skin Contact: Wash skin with soap and water.

Ingestion: Immediately rinse mouth and drink plenty of water (200-300 ml). Large quantities: Get medical attention if irritation develops and persists.

5 FIRE-FIGHTING MEASURES

Extinguishing Media: Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable Extinguishing Media: Not applicable.

Special Fire Fighting Procedures: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Unusual Fire & Explosion Hazards: None known.

Hazardous Combustion Products: Carbon Oxides, Hydrocarbons, Monomers, Sulfur Oxides

Protective Measures: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

Flammability Class: NFPA Rating Fire = 1.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: In case of spills, beware of slippery floors and surfaces. See Section 8 of the MSDS for Personal Protective Equipment.

Spill Cleanup Methods: Sweep up spilled substance and remove to safe place. Do not discharge onto the ground or into water courses. Collect and dispose of spillage as indicated in section 13 of the MSDS.

7 HANDLING AND STORAGE

Handling: Avoid contact with eyes and prolonged skin contact. See Section 8 of the MSDS for Personal Protective Equipment. Observe good industrial hygiene practices.

Storage: Store at temperatures above 0°C. Store at temperature below 40°C. Keep in original container. Keep container tightly closed to prevent the loss of water. Store away from incompatible materials.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits: No exposure limits noted for ingredient(s).

Engineering Controls: Provide adequate ventilation.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: High-efficiency particulate respirator.

Eye Protection: Risk of contact: Wear approved safety goggles.

Hand Protection: Risk of contact: Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

Skin Protection: Risk of contact: Use skin protection. It is a good industrial hygiene practice to minimize skin contact.

Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental Exposure Controls: Environmental manager must be informed of all major spillages.

9 PHYSICAL AND CHEMICAL PROPERTIES

Color: Not applicable.
Odor: Not applicable.
Odor Threshold: Not applicable.
Physical State: Solid (bead)
pH: Not applicable

Melting Point: Not applicable.
Freezing Point: Not applicable.
Boiling Point: Not applicable.
Flash Point: Not applicable.
Evaporation Rate: Not applicable.
Flammability Limit - Upper (%): Not applicable.
Flammability Limit - Lower (%): Not applicable.
Vapor Pressure: Not applicable.
Vapor Density (Air=1): Not applicable.
Specific Gravity: Not applicable.
Solubility in Water: Insoluble
Solubility (Other): Not applicable.
Partition Coefficient (n-Octanol/water): Not applicable.
Autoignition Temperature: Not applicable.
Decomposition Temperature: Not applicable.

10 STABILITY AND REACTIVITY

Stability: Material is stable under normal conditions.

Conditions to Avoid: Avoid heat.

Incompatible Materials: Strong oxidizing agents. Nitric acid.

Hazardous Decomposition Products:

At Elevated Temperatures:	Carbon Oxides, Hydrocarbons, Monomers, Sulfur Oxides

Possibility of Hazardous Reactions: Will not occur.

11 TOXICOLOGICAL INFORMATION

Listed Carcinogens: None.

Product Information
Acute Toxicity: No additional adverse health effects noted.

Chronic Toxicity: No data available.

12 ECOLOGICAL INFORMATION

Ecotoxicity: No data available.

Mobility: The product is insoluble in water and will sediment in water systems.

Persistence and Degradability: The product is not readily biodegradable.

Bioaccumulation Potential: Potential to bioaccumulate is low.

Other Adverse Effects: No data available.

13 DISPOSAL CONSIDERATIONS

General Information: Dispose of waste and residues in accordance with local authority requirements.

Disposal Methods: No specific disposal method required.

Container: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14 TRANSPORT INFORMATION

DOT Not regulated.

TDG Not regulated.

IATA Not regulated.

IMDG Not regulated.

15 REGULATORY INFORMATION

Canadian Controlled Products Regulations: This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33, and the MSDS contains all required information.

WHMIS Classification: This is not a WHMIS controlled product.

Mexican Dangerous Statement: This product is not dangerous according to Mexican regulations.

Inventory Status

This product or all components are listed or exempt from listing on the following inventory: DSL, TSCA

US Regulations

CERCLA Hazardous Substance List (40 CFR 302.4): Not regulated.

SARA Title III
Section 302 Extremely Hazardous Substances (40 CFR 355, Appendix A): Not regulated.

Section 311/312 (40 CFR 370):
☐ Acute (Immediate) ☐ Chronic (Delayed) ☐ Fire ☐ Reactive ☐ Pressure Generating

Section 313 Toxic Release Inventory (40 CFR 372): Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
Not regulated.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3): Not regulated.

Drug Enforcement Act: Not regulated.

TSCA

TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated.

TSCA Section 5(a)(2) Final Significant New Use Rules (SNURs) (40CFR 721, Subpt. E): Not regulated.

TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D): Not regulated.

State Regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): Not regulated.

Massachusetts Right-To-Know List: Not regulated.

Michigan Critical Materials List (Michigan Natural Resources and Environmental Protection Act (Act. 451 of 1994)): Not regulated.

Minnesota Hazardous Substances List: Not regulated.

New Jersey Right-To-Know List: Not regulated.

Pennsylvania Right-To-Know List: Not regulated.

Rhode Island Right-To-Know List: Not regulated.

16 OTHER INFORMATION

HAZARD RATINGS

	Health Hazard	Fire Hazard	Instability	Special Hazard
NFPA	1	1	0	0

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
NFPA Label colored diamond code: Blue - Health; Red - Flammability; Yellow - Instability; White - Special Hazards

	Health Hazard	Flammability	Physical Hazard	Personal Protection
HMIS	1	1	0	–

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
HMIS Label colored bar code: Blue - Health; Red - Flammability; Orange - Physical Hazards; White - Special

Issue Date: 07-Dec-2007
Supercedes Date:
SDS No.: 001
Disclaimer: The information provided in this material safety data sheet is based on current knowledge about the product and current legal requirements and standards. It relates specifically to health, safety and

environmental requirements and standards, may not identify all hazards associated with the product or its uses or misuses, does not signify any warranty with regard to the properties of the product, and only applies when the product is used for the purposes indicated in section 1. This product is not sold as suitable for other purposes and such other usage may cause risks not mentioned in this material safety data sheet.

SIEMENS Water Technologies

Material Safety Data Sheet

SECTION 1 – CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name: ACTIVATED CARBON, POWDERED, AquaPAC
Part Number: 101 **Chemical Family**: activated carbon

Manufacturer's Name: Siemens Water Technologies Corp.
Address: 181 Thorn Hill Road, Warrendale, PA 15086
Product/Technical Information Phone Number: (323) 277-1500
Medical/Handling Emergency Phone Number: CHEMTREC 1-800-424-9300 24 hours a day
Transportation Emergency Phone Number: CHEMTREC 1-800-424-9300 24 hours a day
Revision Date/Revision Number: February 13, 2002

SECTION 2 – COMPOSITION INFORMATION

Chemical Name	Percent by Weight	CAS#
Activated Carbon	100	7440-44-0

SECTION 3 – HAZARDS IDENTIFICATION

Appearance & Odor: black granules without taste or odor

Emergency Overview: Dust that contacts eyes may be irritating or cause mechanical injury. Dust may cause slight skin irritation. Dust may be irritating to the respiratory tract and cause coughing or sneezing. Ingestion of powder may be irritating to the gastrointestinal tract. Warning: Wet activated carbon depletes oxygen from the air and therefore dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed.

Fire &Explosion Hazards: When burned, hazardous products of combustion including carbon oxides can occur. Irritating and/or toxic gases due to decomposition of the product may be generated during a fire. Fight fire from a safe distance from a protected location. Contact with strong oxidizers such as ozone or liquid oxygen may cause rapid combustion.

Primary Route(s) of Exposure: Eye contact, skin contact, ingestion, or inhalation are all possible routes of entry.

Inhalation- Acute Effects: Dust may be irritating to the respiratory tract and cause coughing or sneezing.

Skin Contact-Acute Effects: Dust may cause slight skin irritation.

Eye Contact- Acute Effects: Dust that contacts eyes may be irritating or cause mechanical injury.

Ingestion- Acute Effects: Ingestion of powder may be irritating to the gastrointestinal tract.

SECTION 4 – FIRST AID MEASURES

Inhalation First Aid: Remove affected person from area to fresh air and provide oxygen if breathing is difficult. Give artificial respiration ONLY if breathing has stopped and give CPR ONLY if there is no breathing and no pulse. Obtain medical attention.

Skin Contact First Aid: Wash skin for 5 minutes with flowing water and soap. Clothing should be discarded or washed before reuse. Obtain medical assistance if irritation develops. DO NOT instruct person to neutralize affected skin area.

Eye Contact First Aid: Immediately irrigate eyes with flowing water continuously for 15 minutes while holding eyes open. Contacts should be removed before or during flushing. Seek medical assistance if irritation develops. DO NOT instruct person to neutralize.

Ingestion First Aid: Vomiting may need to be induced if directed by a physician or poison control center. DO NOT have unqualified personnel induce vomiting. Obtain medical attention immediately.

Medical Conditions Aggravated: Respiratory ailments may be aggravated by exposure to this product.

Note to Physician: No specific antidote, treat patient symptomatically.

SECTION 5 – FIRE FIGHTING MEASURES

Flash Point/Method: Nonflammable

Auto Ignition Temperature: 840°C (1,710°F)

Upper/Lower Explosion Limits: not applicable

Extinguishing Media: Water spray, carbon dioxide, foam or dry chemical

Fire Fighting Procedures: In the event of a fire, wear full protective clothing and NIOSH approved self-contained breathing apparatus with full face piece, operated in the positive pressure mode.

Fire & Explosion Hazards: When burned, hazardous products of combustion including carbon oxides can occur. Irritating and/or toxic gases due to decomposition of the product may be generated during a fire. Fight fire from a safe distance from a protected location. Contact with strong oxidizers such as ozone or liquid oxygen may cause rapid combustion.

Hazardous Products of Decomposition and /or Combustion: Carbon oxides.

NFPA Ratings:

HEALTH-1 FLAMMABILITY- 0 REACTIVITY-0 OTHER- none

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Clean up spills in a manner that does not disperse dust into the air. Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure, and removal of material from eyes, skin, and clothing. Dispose of virgin (unused) carbon (waste or spillage) in a facility permitted for non-hazardous wastes. Spent (used) carbon should be disposed of in accordance with applicable laws. Do not reuse empty bags. Dispose of in facility permitted for non-hazardous wastes.
DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State, Local and Provincial laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

SECTION 7 – HANDLING AND STORAGE

Handling: Avoid dispersion into air. Keep containers dry and closed. Follow good handling and housekeeping practices to minimize spills, generation of airborne dusts, and accumulation of dusts on exposed surfaces. Use with adequate exhaust ventilation to draw dust away from workers' breathing zones. Prevent or minimize exposures to dusts by using appropriate respirators, gloves, and eye protection. Wash exposed skin areas thoroughly with soap and water. Use caution when pouring, using pneumatic transport, swirling, etc. as this material can become electrostatically charged.

Storage: Avoid breaking bags or spilling media so as to avoid possibly creating residual dust. Store in ambient atmospheric conditions. Product should be stored in a closed dry container. Maintain good housekeeping procedures. Store away from strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc.

General Comments: Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

SECTION 8 –PERSONAL PROTECTION/ EXPOSURE CONTROL

Respiratory Protection: Use NIOSH/MSHA approved respiratory protection equipment appropriate to the material and/or its concentration where airborne exposure is likely. If exposures cannot be kept to a minimum with engineering controls, consult manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer.

Skin Protection: Wear appropriate dust resistant clothing and gloves.

Eye Protection: Safety glasses with side shields are recommended for any type of handling. Where eye contact or dusty conditions may be likely, dust tight goggles are recommended.

Ventilation Protection: Provide ventilation if necessary to minimize exposure. Dilute ventilation acceptable, but local mechanical exhaust ventilation preferred, if practical, at sources of air contamination such as open process equipment. The following publication offers ventilation guidelines and techniques: "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICE" available from the ACGIH.

Other Protection: Safety showers, with quick opening valves which stay open, and eye wash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.

Exposure Limits:
OSHA PEL-TWA: 15 mg/m^3 (total), 5 mg/ m^3 (resp)
OSHA PEL-STEL: 10 mg/m^3

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: black granules without taste or odor

Vapor Pressure: zero

Vapor Density (Air=1): not applicable

Boiling Point: not applicable

Melting Point: not applicable

Specific Gravity: 0.25 - 0.60 g/cc

Solubility in Water: Insoluble

Volatile Percentage: 0%

pH: not determined

Flash Point/method: Nonflammable

Auto Ignition Temperature: 840°C

Upper/Lower Explosion Limits: not applicable

Other: none

SECTION 10 – STABILITY AND REACTIVITY

Stability: This product is considered stable under the specified conditions of storage, shipment and use.

Incompatibilities: Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc. may result in rapid combustion. Avoid contact with strong acids.

Polymerization: Hazardous polymerization will not occur.

Decomposition: Hazardous decomposition will produce carbon oxides.

Conditions to avoid: Store away from strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc. Moist air will reduce the operating life.

SECTION 11 – TOXICOLOGICAL INFORMATION

INHALATION – Acute: Inhalation of carbon dust is mildly irritating to the lungs and can immediately give rise to an increased mucociliary transport and airway resistance mediated by the vagus. The inhalation LC50 (Rat) is > 64.4 mg/l.

INHALATION – Chronic: There are no known chronic inhalation effects.

SKIN CONTACT – Acute: Skin contact is expected to be slightly irritating. The primary skin irritation index (rabbit) is 0.

SKIN CONTACT – Chronic: There are no known chronic dermal effects.

EYE CONTACT – Acute: Eye contact can cause conjunctivitis, epithelial hyperplasia of the cornea, as well as eczematous inflammation of the eyelids.

INGESTION – Acute: Carbon is practically nontoxic. The probable oral lethal dose (human) is greater than 15 g/kg; more than one quart (2.2 lbs) for a 70 kg (150 lb) person.

INGESTION – Chronic: There are no known chronic ingestion effects.

CARCINOGENICITY/MUTAGENICITY: There are no known carcinogenic/mutagenic effects.

REPRODUCTIVE EFFECTS: There are no known reproductive effects.

NEUROTOXICITY: There are no known neurotoxic effects.

OTHER EFFECTS: No other toxic effects of carbon are known.

TARGET ORGANS: Target organs include the respiratory system and the cardiovascular system.

SECTION 12 – ECOLOGICAL INFORMATION

This material, in its original state, is not harmful to the environment.

SECTION 13 – DISPOSAL CONSIDERATIONS

Clean spills in a manner that does not disperse dust into the air, preferably a wet-down procedure or vacuum. If material is not contaminated, spilled media can be rebagged. Material that cannot be used or chemically reprocessed and empty containers should be disposed of in accordance with all applicable regulations. Product containers should be thoroughly emptied before disposal. Generators of waste material are required to evaluate all waste for compliance with RCRA and any local disposal procedures and regulations. NOTE: State and local regulations may be more stringent than federal regulations.

Warning: Wet activated carbon depletes oxygen from the air and therefore dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed.

SECTION 14 – TRANSPORTATION INFORMATION

DOT Shipping Description: Not DOT Regulated

SECTION 15 – REGULATORY INFORMATION

CERCLA SECTION 103 (40CFR302.4): no RQ: none
SARA SECTION 302 (40CFR355.30): no
SARA SECTION 304 (40CFR355.40): no
SARA SECTION 313 (40CFR372.65): no
SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):

ACUTE: yes CHRONIC: no FIRE: no REACTIVE: no SUDDEN RELEASE: no
OSHA PROCESS SAFETY (29CFR1910.119): no
CALIFORNIA PROPOSITION 65: no

SECTION 16 – OTHER INFORMATION

Disclaimer: The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the user thereof. It is the buyer's responsibility to ensure that its activities comply with federal, state, provincial and local laws.

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION

Envirotemp® FR3® fluid

Envirotemp FR3 fluid is a dielectric fluid intended for use as an insulation and cooling medium in electrical apparatus such as electrical distribution and power transformers.

Cooper Power Systems
1900 East North Street
Waukesha, Wisconsin 53188-3899 USA
Telephone: +01 262 524 3300
Internet: www.cooperpower.com
Emergency telephone (Chemtrec): +01 800 262 8200

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Envirotemp FR3 fluid is a proprietary formulation using food-grade vegetable oils combined with performance-enhancing additives. All components are listed in the EINECS inventory.

Component	Proportion (wt%)
Vegetable oil	> 98.5
Antioxidant additive	< 1.0
Cold flow additive	< 1.0
Colorant	< 1.0

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3. HAZARDS IDENTIFICATION

Envirotemp FR3 fluid is a preparation not classified as dangerous according to Directive 1999/45/EC. Not expected to cause a severe emergency hazard.

Routes of entry

Eyes: Contact may occur as a result of splash or exposure to mist conditions. May cause irritation and redness.

Skin: Typically non-irritating. In some case, a sensitization to vegetable oils may cause localized redness

Ingestion: May cause gastric irritation.

Inhalation: Exposure may occur as a result of mist exposure. May cause respiratory irritation.

Signs and symptoms of exposure: none known

Medical conditions generally aggravated by exposure: There is a very small risk for an allergic reaction to soybean oil in persons allergic to soybeans themselves.

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4. FIRST AID MEASURES

Inhalation: If inhaled, remove affected person from exposure to mists.

Eye contact: For eye contact, flush the eyes immediately with large amounts of water with the eyelids held away from the eye to ensure thorough rinsing.

Skin contact: For skin contact, remove by washing with soap and water. Get medical attention if irritation persists.

Ingestion: If swallowed, observe for signs of stomach discomfort or nausea. If symptoms persist, seek medical help. Do not induce vomiting.

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5. FIRE-FIGHTING MEASURES

Extinguishing media: CO_2 or dry chemical foam

Special fire fighting procedures: Use approved self-contained breathing apparatus with full facemask and full protective equipment in confined areas. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from source of ignition. Application of water to flaming oil can cause spreading.

Unusual fire and explosion hazards: Slight when exposed to flame. Can react with oxidizing materials. Clay materials (Fuller's earth, oil dry products) saturated with Envirotemp FR3 fluid can, under certain conditions, undergo a slow oxidation that releases heat. If the heat so released cannot escape, it is possible that the temperature may increase and ignite combustible materials in close contact.

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6. ACCIDENTAL RELEASE MEASURES

Steps to take in case material is released or spilled: Contain and control the leaks or spills with non-combustible absorbent materials such as sand, earth, vermiculite, or diatomaceous earth in drums for waste disposal. Prevent any material from entering drains or waterways. If the product contaminates waterways, rivers or drains, alert the relevant authorities in accordance with statutory procedures.

In the USA, spills into navigable waters must be reported to the National Response Center, 800-424-8802

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7. HANDLING AND STORAGE

Precautions to take in handling and storage: Avoid extremes of temperature in storage. Store Envirotemp FR3 fluid in labeled, tightly closed containers in cool, dry, isolated and well-ventilated areas, away from sources of ignition or heat. To maintain fluid for intended use as an electrical insulating fluid, eliminate exposure to oxygen and moisture.

Intermediate bulk storage container (tote): Prolonged exposure to ultraviolet radiation (sunlight) may affect color.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:

	TWA (mg/m^3)	
	OSHA[1] PEL	ACGIH[2] TLV
Vegetable oil mists	–	10
Vegetable oil mists: total dust	15	–
Vegetable oil mists: respirable fraction	5	–

Hazardous Materials Identification System (HMIS):	**Health**	**Flammability**	**Physical Hazard**
	0	1	0

Respiratory protection: Use approved supplied-air respiratory protection if occupational exposure limits are exceeded.

Ventilation: General mechanical ventilation can be used to control or reduce airborne concentrations of oil.

Protective gloves: Oil- and heat-resistant gloves are recommended when fluid temperature is above ambient conditions.

Eye protection: Wear safety glasses or goggles to prevent eye contact. Eye baths should be readily available in the area of handling Envirotemp FR3 fluid.

Other protective clothing or equipment: Wear regularly laundered coveralls or lab coat to minimize skin exposure.

Workplace hygienic practices: Wash with soap and water after contact. Avoid exposure to mists.

Environmental exposure controls: Have oil-absorbent materials easily available.

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[1] U.S. Occupational Health and Safety Administration

[2] American Conference of Governmental Industrial Hygienists

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and odor: clear light-green liquid with slight vegetable oil odor **pH:** neutral

Closed cup flash point: 310 – 320°C

Boiling point: >360°C

Vapor pressure (mm Hg): < 0.01 @ 20°C

Vapor density (air = 1): n/a

Solubility in water: negligible; < 0.1%

Viscosity: 33-35 mm^2/s at 40°C

Autoignition temperature: 401 – 404°C

Relative density (H_2O = 1): 0.92

Pour point: -18 to -24°C

Evaporation rate (butyl acetate = 1): nil

Volatile organic compounds: < 0.001 g/L

Miscibility: mixes with other dielectric fluids except silicone

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10. STABILITY AND REACTIVITY

Stability: Envirotemp FR3 fluid is stable under normal conditions of use.

Incompatibility (materials to avoid): Avoid contact with strong oxidizing agents.

Hazardous decomposition products: none

Hazardous Polymerization: will not occur

Stabilizers: not required

Hazardous exothermic reaction: Slight when exposed to flame; can react with oxidizing materials. Class III B liquid. Clay materials (Fuller's earth, oil dry products) saturated with Envirotemp FR3 fluid can, under certain conditions, undergo a slow oxidation that releases heat. If the heat so released cannot escape, it is possible that the temperature may increase and ignite combustible materials in close contact.

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11. TOXICOLOGICAL INFORMATION

Carcinogenicity: none **NTP:** no **IARC monographs:** no **OSHA regulated:** no

Envirotemp FR3 fluid base oil is "generally recognized as safe" (GRAS) by the U.S. Food and Drug Administration and allowed for human consumption as a food and as a component that is allowed in contact with human food.

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12. ECOLOGICAL INFORMATION

Acute oral toxicity (OECD 420 - rats): LD_{50} >2000 mg/kg

Acute aquatic toxicity (OECD 203 - trout): LC_{50} >1000 mg/kg; NOAEC >1000 mg/kg

Aquatic biodegradation (OPPTS 835.3110): readily biodegradable, >99%

Biological oxidation demand (5-Day SM5210B): 250 ppm

Chemical oxygen demand (SM5220D): 560 ppm **BOD/COD ratio:** 45%

Petroleum hydrocarbon content: none

Environmental physical hazard: Envirotemp FR3 fluid shares physical hazards common to all oils such as coating feathers, fur and gills.

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13. DISPOSAL CONSIDERATIONS

Recycling: Consult with local used oil recyclers, restaurant grease recyclers, fat rendering companies, or biodiesel producers.

Hazardous Waste: Envirotemp FR3 fluid itself, when discarded or disposed of, is not a hazardous waste. Envirotemp FR3 fluid from retrofilled electrical equipment may contain residues of earlier fluid(s) in such quantity as to qualify as a hazardous waste.

Disposal: Incinerate or landfill in accordance with local regulations. Do not pour into drains or waterways.

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14. TRANSPORT INFORMATION

Harmonized System Tariff Classification (Schedule B): 1507.90.4050

National Motor Freight Classification (NMFC): 155250

Euro Tariff: 15 07 10 10 00

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15. REGULATORY INFORMATION

Envirotemp FR3 fluid itself, when discarded or disposed of, is not listed as a hazardous waste per 40 CFR 261 and is not a used oil per 40 CFR 279. Envirotemp FR3 fluid is a preparation not classified as dangerous according to Directive 1999/45/EC.

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16. OTHER INFORMATION

Technical information available at the Cooper Power Systems website: www.cooperpower.com

This Material Safety Data Sheet has been prepared in order to help the users of Envirotemp FR3 fluid. The data contained herein is accurate as of the date of preparation of this sheet.

Effective Date: May 2, 2007

John Luksich
Senior Engineer – Dielectric Fluids

ScienceLab.com
Chemicals & Laboratory Equipment

Health	3
Fire	0
Reactivity	2
Personal Protection	

Material Safety Data Sheet
Sulfuric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sulfuric acid

Catalog Codes: SLS2539, SLS1741, SLS3166, SLS2371, SLS3793

CAS#: 7664-93-9

RTECS: WS5600000

TSCA: TSCA 8(b) inventory: Sulfuric acid

CI#: Not applicable.

Synonym: Oil of Vitriol; Sulfuric Acid

Chemical Name: Hydrogen sulfate

Chemical Formula: H2-SO4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	95 - 98

Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat]. VAPOR (LC50): Acute: 510 mg/m 2 hours [Rat]. 320 mg/m 2 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion:
Products of combustion are not available since material is non-flammable. However, products of decompostion include fumes of oxides of sulfur. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Fire Hazards in Presence of Various Substances: Combustible materials

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Slightly explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid.
White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact.
May ignite other combustible materials.
May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phorphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.

Special Remarks on Explosion Hazards:
Mixturesofsulfuricacidandanyofthefollowingcanexplode:p-nitrotoluene,pentasilver
trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picratres, fulminats, dienes, alcohols (when heated)
Nitramide decomposes explosively on contact with concentrated sulfuric acid.
1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decompositon.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid.
Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.
May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:
Hygroscopic. Reacts. violently with water. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 STEL: 3 (mg/m3) [Australia] Inhalation
TWA: 1 (mg/m3) from OSHA (PEL) [United States] Inhalation
TWA: 1 STEL: 3 (mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation
TWA: 1 (mg/m3) from NIOSH [United States] Inhalation
TWA: 1 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Thick oily liquid.)

Odor: Odorless, but has a choking odor when hot.

Taste: Marked acid taste. (Strong.)

Molecular Weight: 98.08 g/mole

Color: Colorless.

pH (1% soln/water): Acidic.

Boiling Point:
270°C (518°F) - 340 deg. C
Decomposes at 340 deg. C

Melting Point: -35°C (-31°F) to 10.36 deg. C (93% to 100% purity)

Critical Temperature: Not available.

Specific Gravity: 1.84 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 3.4 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in cold water.
Sulfuric is soluble in water with liberation of much heat.
Soluble in ethyl alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability:
Conditions to Avoid: Incompatible materials, excess heat, combustible material materials, organic materials, exposure to moist air or water, oxidizers, amines, bases.
Always add the acid to water, never the reverse.

Incompatibility with various substances:
Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(316).
Highly corrosive in presence of stainless steel(304).
Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Hygroscopic. Strong oxidizer. Reacts violently with water and alcohol especially when water is added to the product.
Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile+water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, , Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium aceteylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chlorate, Zinc Iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides,
Hydrogen gas is generated by the action of the acid on most metals (i.e. lead, copper, tin, zinc, aluminum, etc.).
Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds.

Special Remarks on Corrosivity:
Non-corrosive to lead and mild steel, but dilute acid attacks most metals.
Attacks many metals releasing hydrogen.
Minor corrosive effect on bronze.
No corrosion data on brass or zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 2140 mg/kg [Rat.].
Acute toxicity of the vapor (LC50): 320 mg/m3 2 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH.
May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive).
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L
Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m3 for 7 hrs.(RTECS)
Teratogenecity: neither embryotoxic, fetoxic, nor teratogenetic in mice or rabbits at inhaled doses producing some maternal toxicity

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis.
Eye: Causes severe eye irritation and burns. May cause irreversible eye injury.
Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestial tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to acute inhalation). It may also cause systemic toxicity with acidosis.
Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the repiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration).
Chronic Potential Health Effects:
Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion).
Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 49 mg/l 48 hours [bluegill/sunfish].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Sulfuric acid may be placed in sealed container or absorbed in vermiculite, dry sand, earth, or a similar material. It may also be diluted and neutralized. Be sure to consult with local or regional authorities (waste regulators) prior to any disposal. Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sulfuric acid UNNA: 1830 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Sulfuric acid
New York release reporting list: Sulfuric acid
Rhode Island RTK hazardous substances: Sulfuric acid
Pennsylvania RTK: Sulfuric acid
Minnesota: Sulfuric acid
Massachusetts RTK: Sulfuric acid
New Jersey: Sulfuric acid
California Director's List of Hazardous Substances (8 CCR 339): Sulfuric acid
Tennessee RTK: Sulfuric acid
TSCA 8(b) inventory: Sulfuric acid
SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid
SARA 313 toxic chemical notification and release reporting: Sulfuric acid
CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

DSCL (EEC):
R35- Causes severe burns.
S2- Keep out of the reach of children.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S30- Never add water to this product.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves.
Full suit.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Face shield.

Section 16: Other Information

References:
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

Other Special Considerations: Not available.

Created: 10/09/2005 11:58 PM

Last Updated: 11/06/2008 12:00 PM

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ATTACHMENT 3

ENLARGED FIGURES

This section contains enlarged reprints of maps and figures presented previously in the QRA. These are provided to allow the reader to study the maps and figures in more detail as some of them may be difficult to read at the size used in the previous sections. Each figure is labelled with the same figure number and name as the corresponding figure in the text. We have also included some figures which are presented in the environmental impact assessment for the CariSal facility.

There are two types of maps presented in this QRA – those that were generated using a geographic information system specifically for this project, and those which are graphics presented in other source documents and presented to give the reader context rather than relay data used in our analysis. The availability and reliability of geospatial data is improving as the technologies become more widely available. All maps are for illustration purposes only. They do not represent a legal survey. Every effort has been made to ensure that the map data are correct and reliable within the limits of currently available and accessible technology and relevant official data from local authorities or sources. Remote Data Concepts, DaCosta Gwendoline, Limited and ICF International cannot assume liability for any damages or injury caused by any errors or omissions in the data, nor any distortions resulting from map projection methods.

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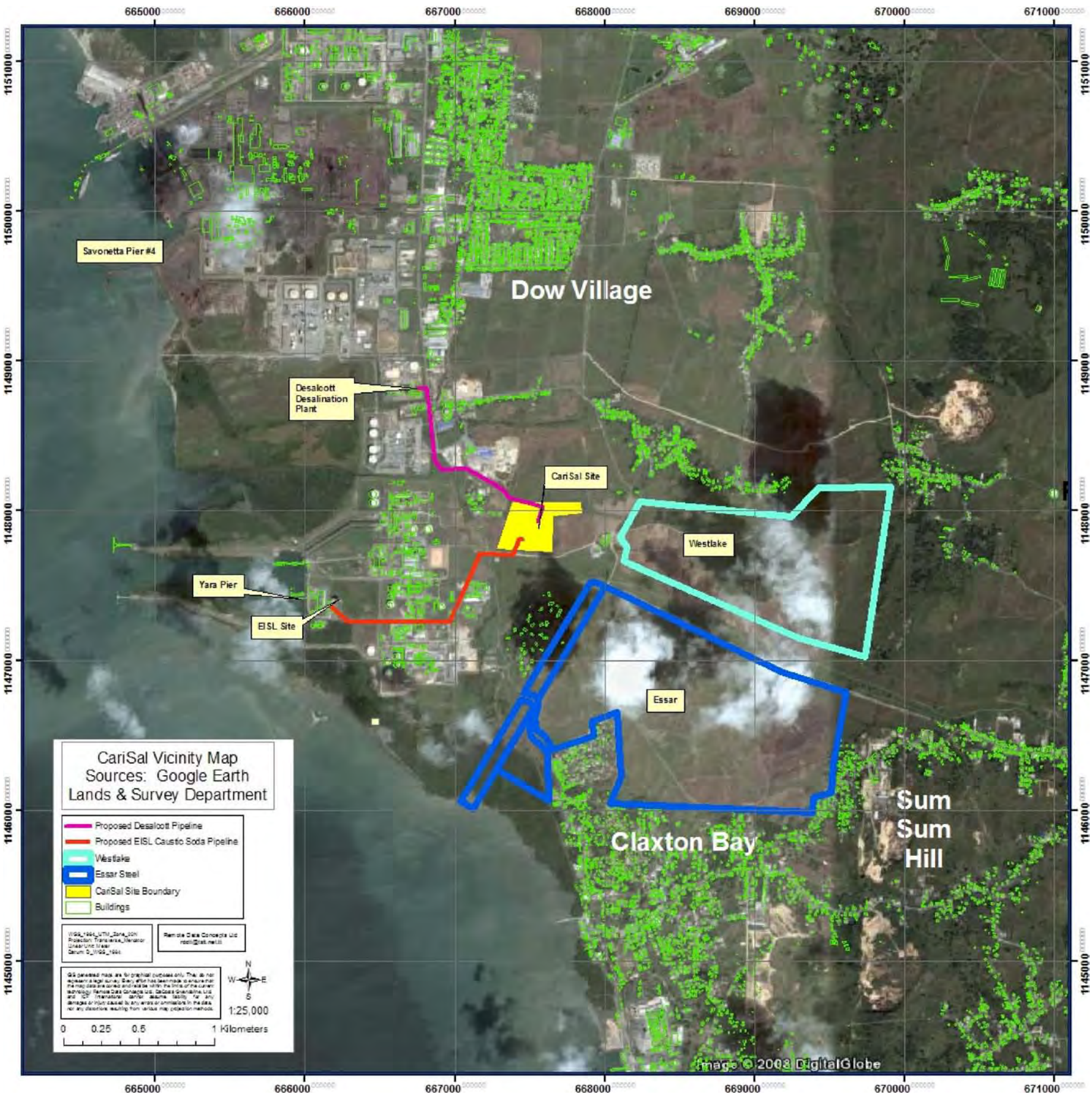


Figure 3.2-1. Vicinity and location of the proposed CariSal site and ex situ pipelines.

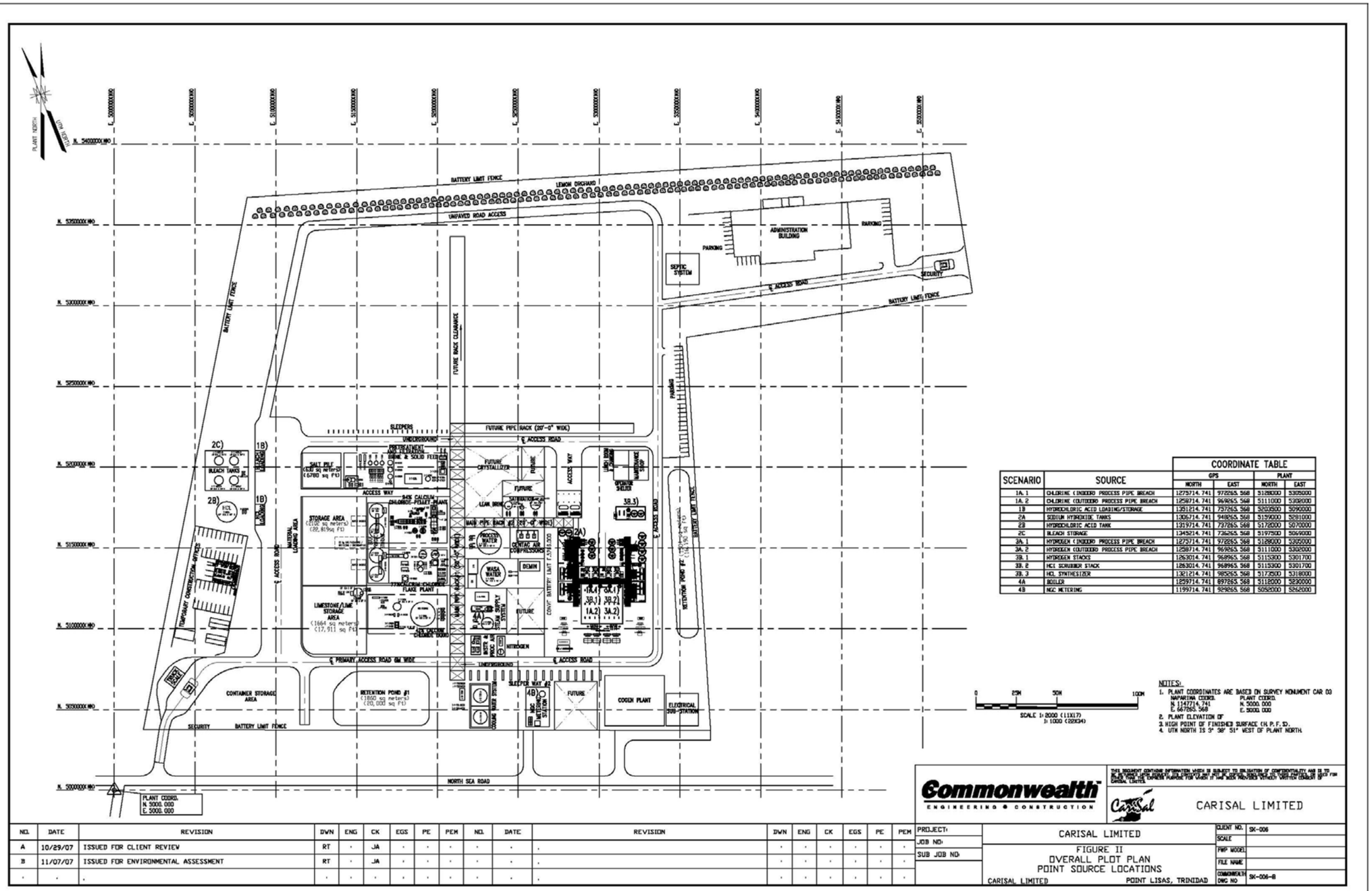


Figure 3.2-2a: Detailed CariSal site plan

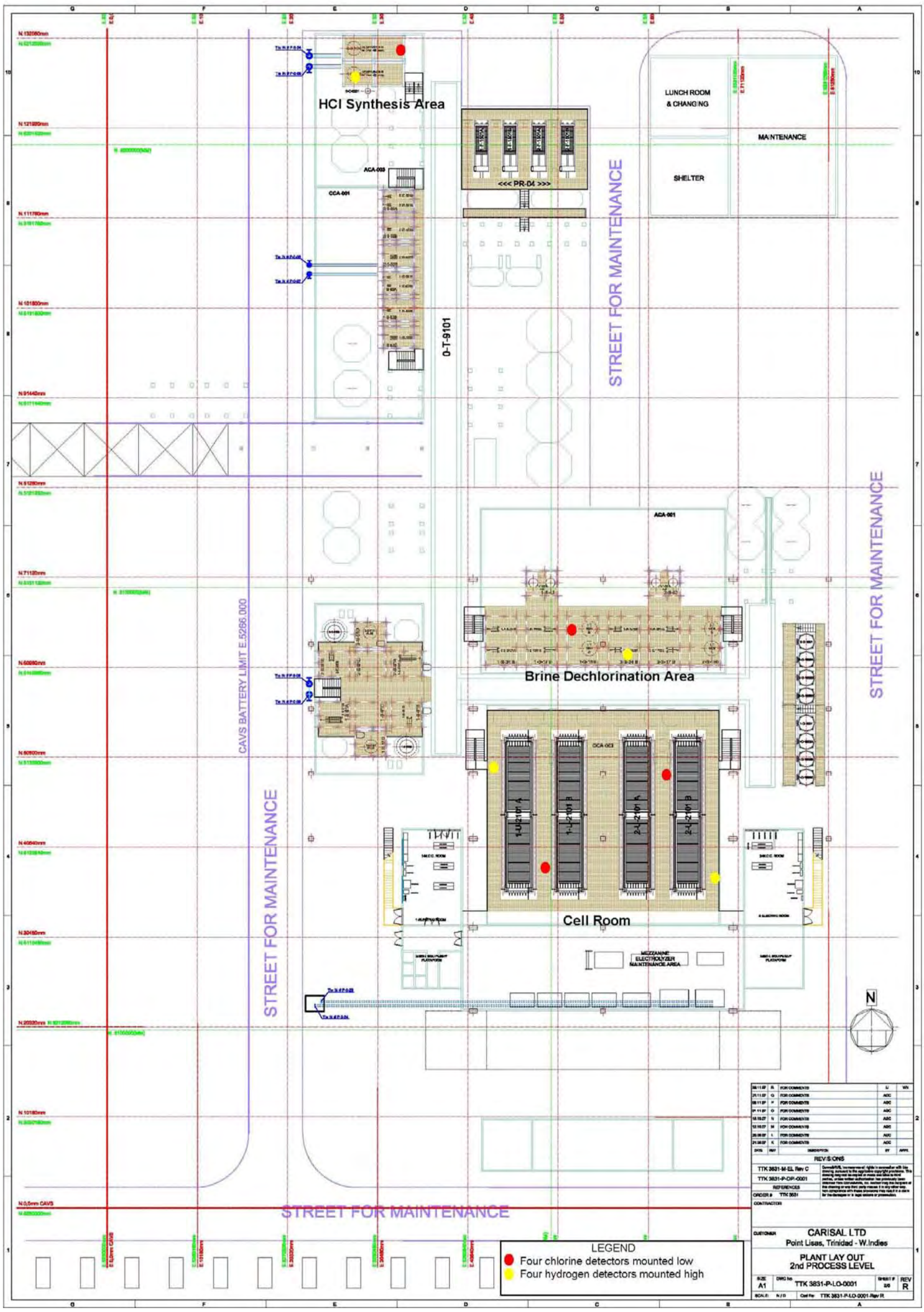


Figure 3.4-13. Locations of hazardous-gas monitors.

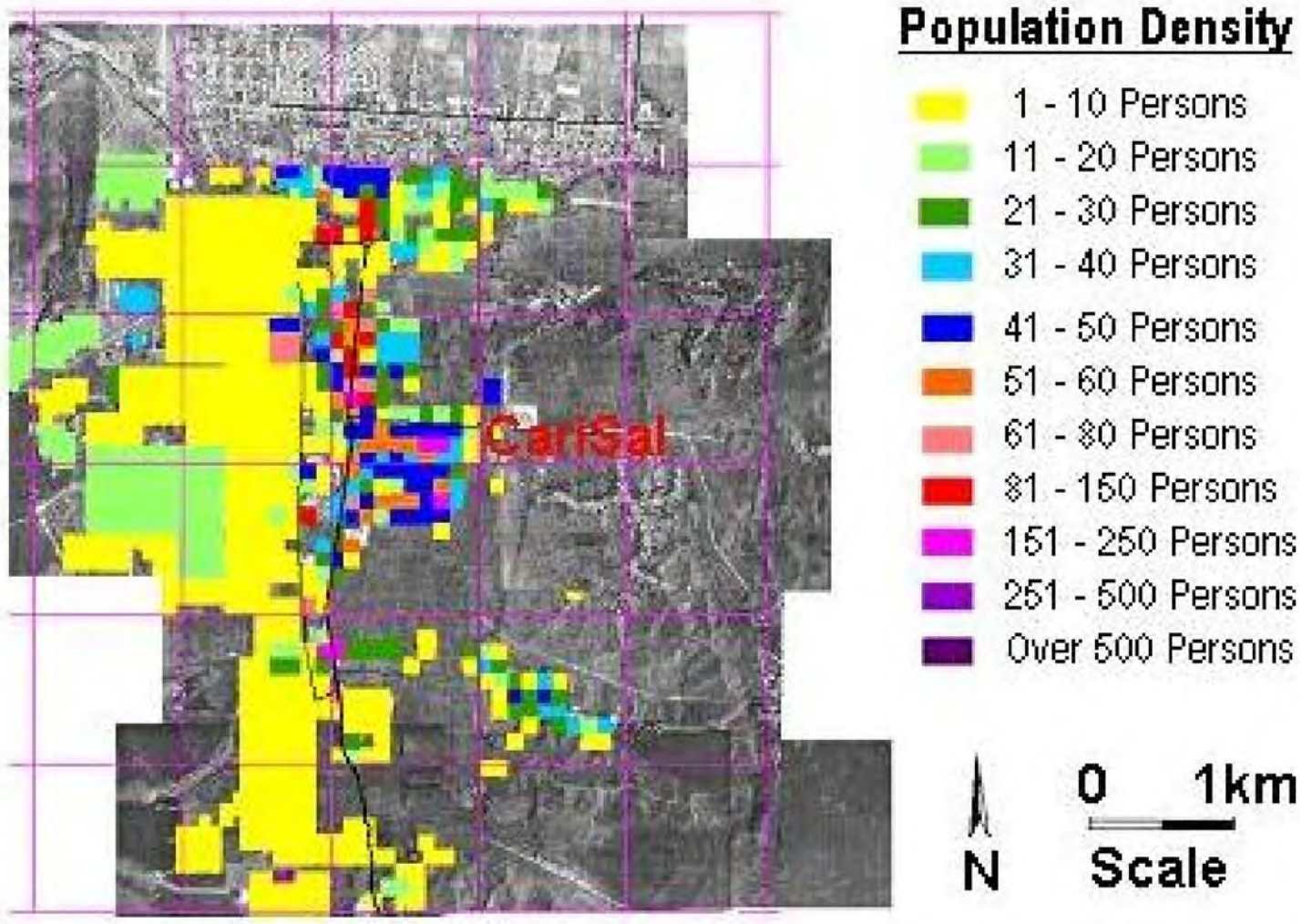
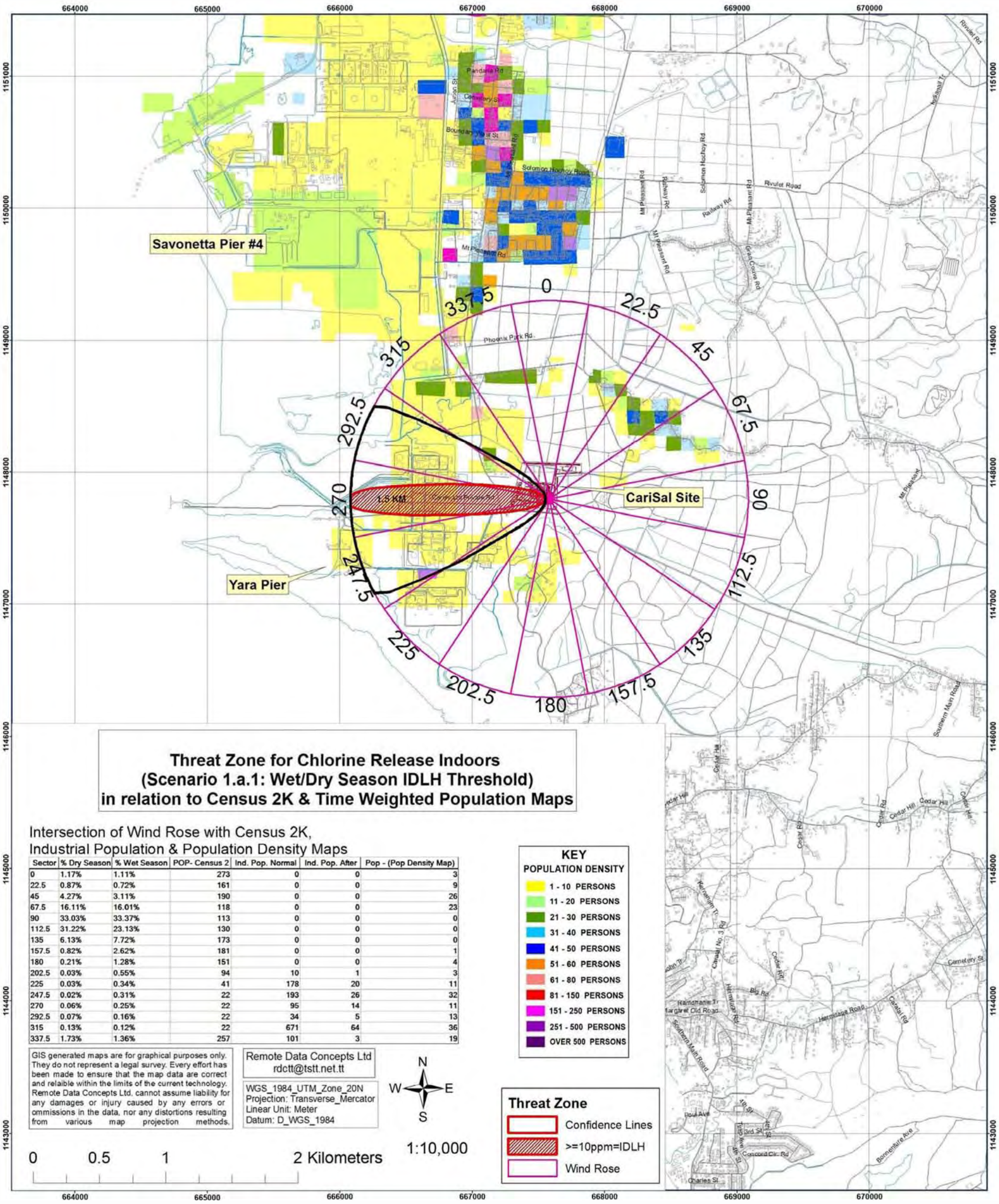
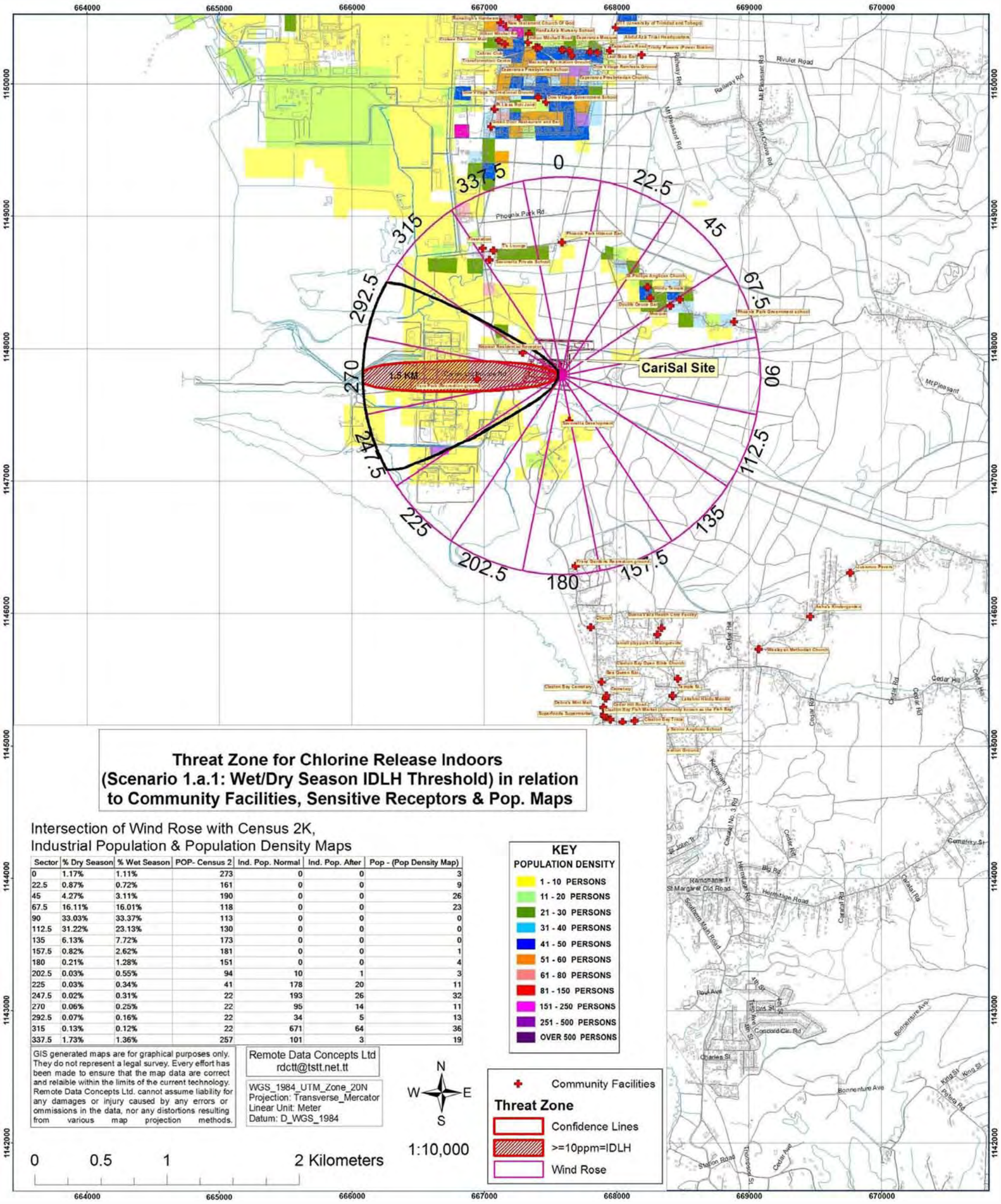


Figure 3.8-1. Time-weighted population map for the vicinity of the CariSal site.



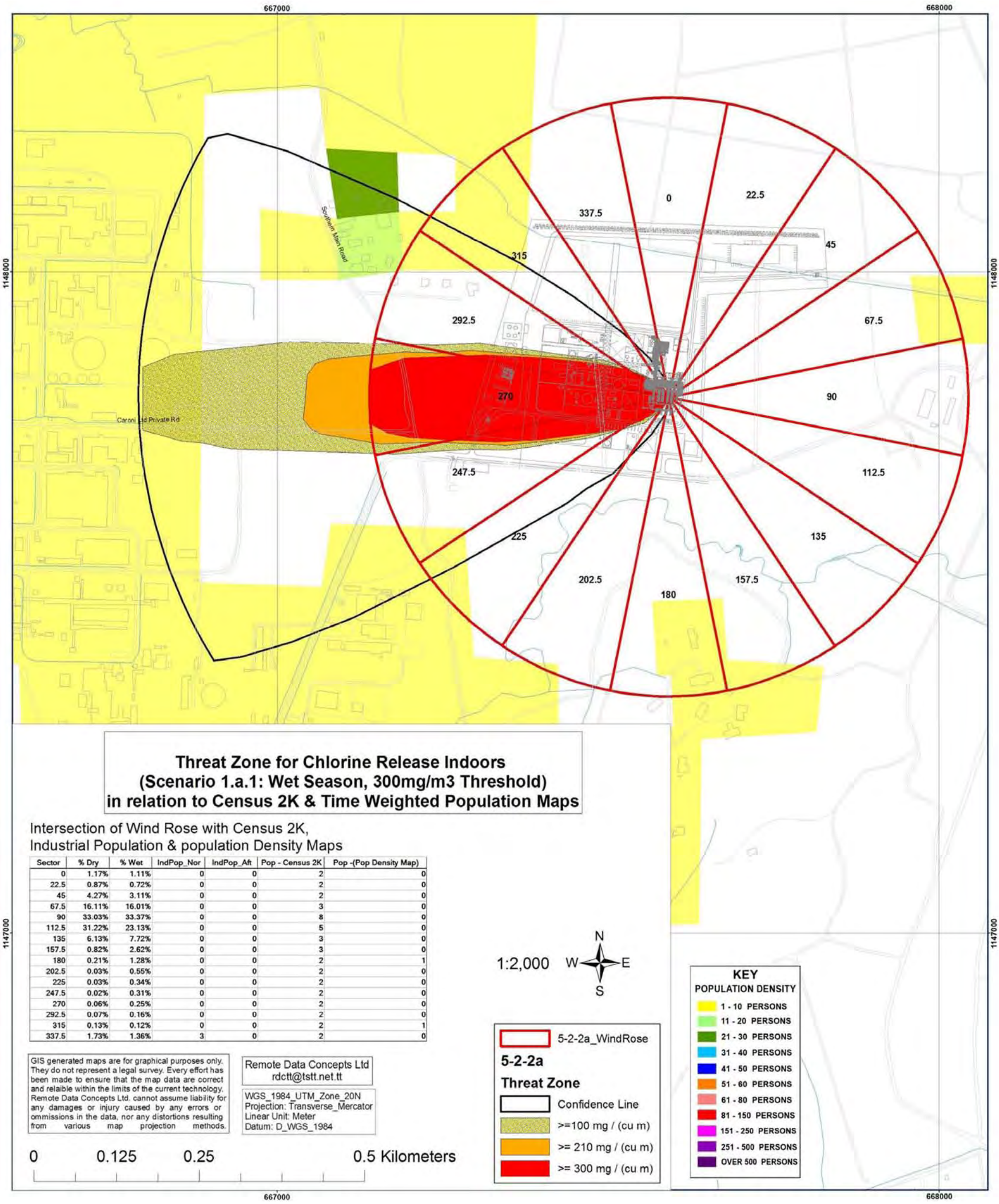
Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop - (Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	161	0	0	9
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure 5.2-1a. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet/Dry Season, IDLH Threshold) in relation to time-weighted population.



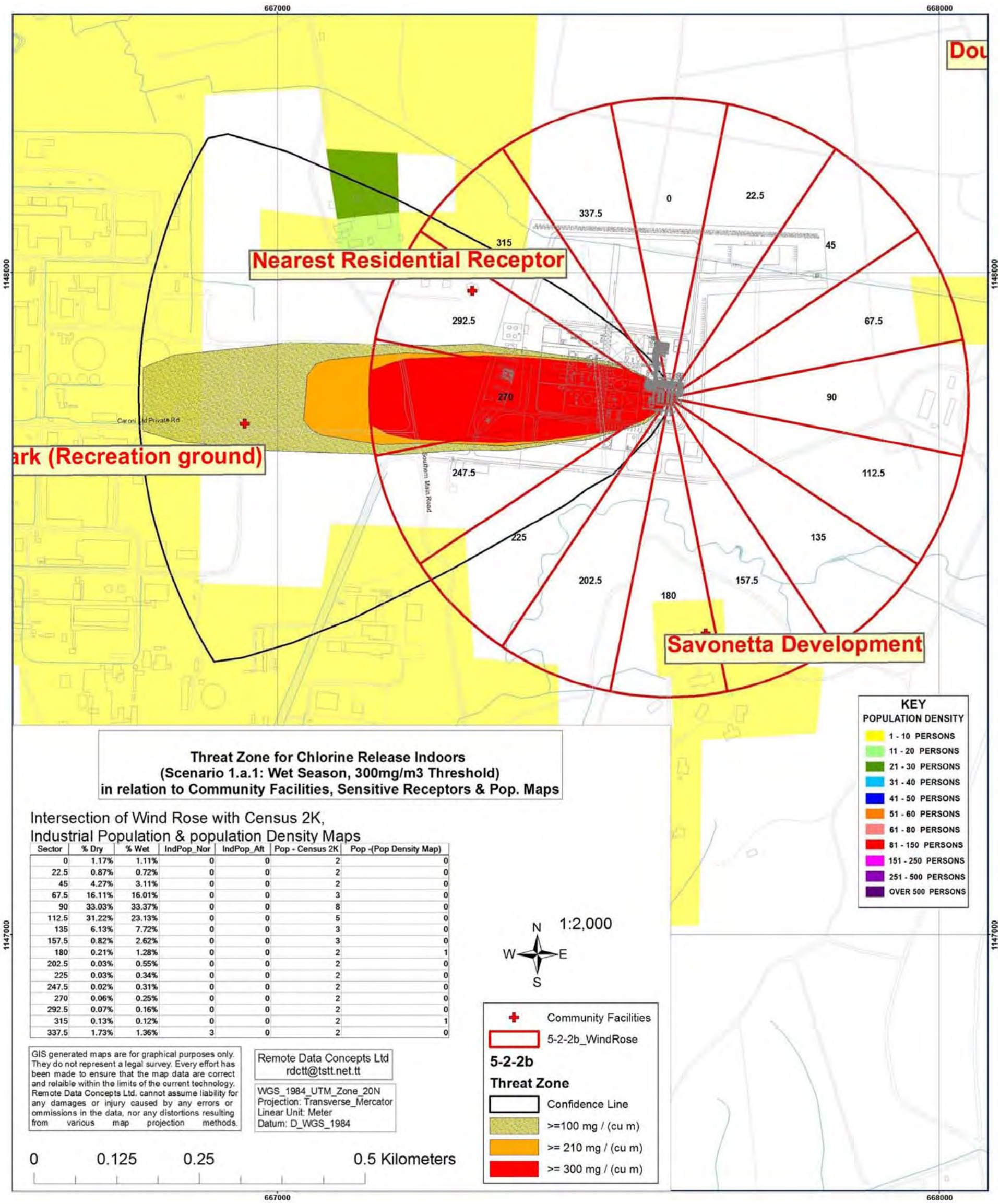
Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop - (Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	161	0	0	9
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure 5.2-1 b. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet/Dry Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



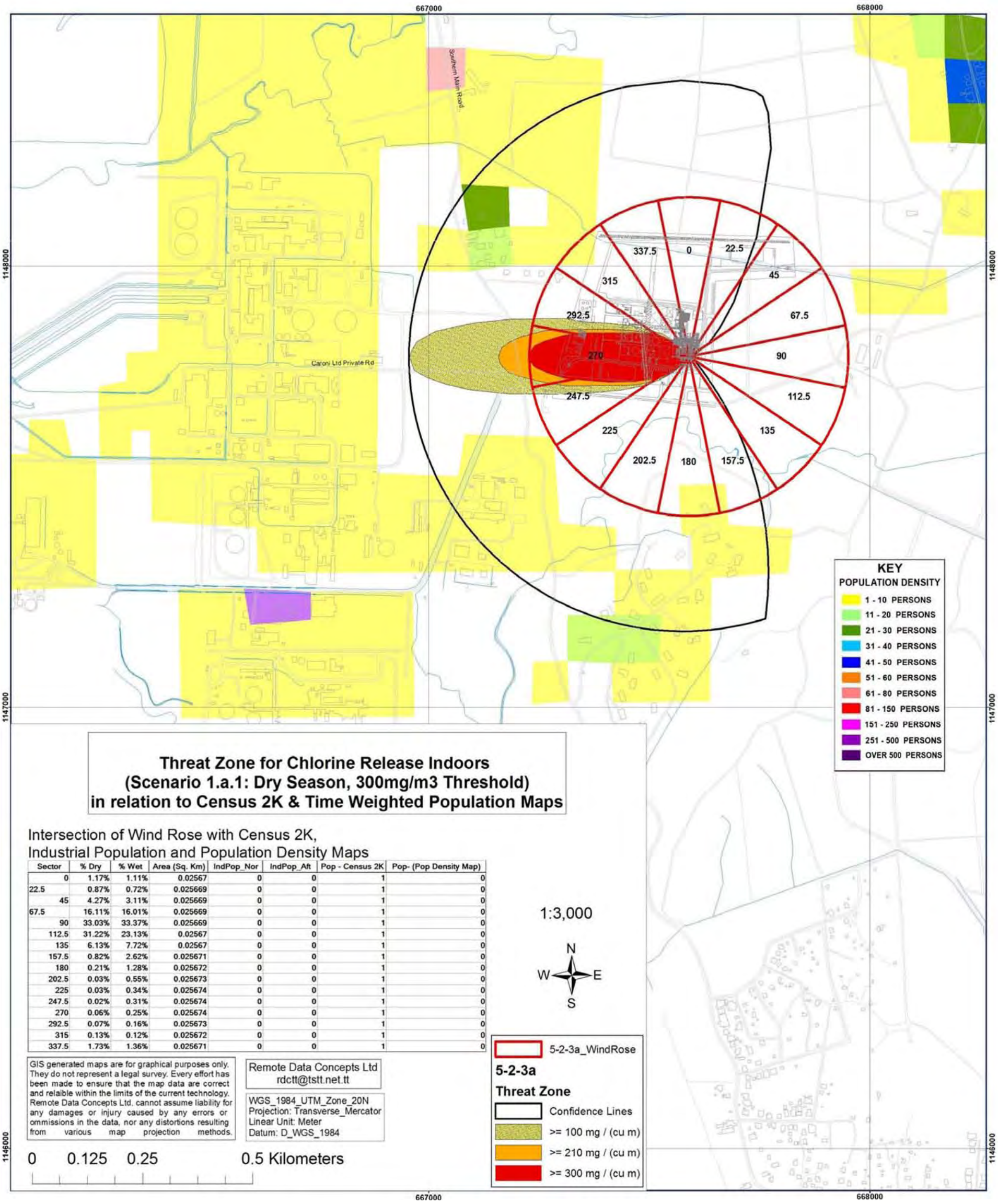
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop -(Pop Density Map)
0	1.17%	1.11%	0	0	2	0
22.5	0.87%	0.72%	0	0	2	0
45	4.27%	3.11%	0	0	2	0
67.5	16.11%	16.01%	0	0	3	0
90	33.03%	33.37%	0	0	8	0
112.5	31.22%	23.13%	0	0	5	0
135	6.13%	7.72%	0	0	3	0
157.5	0.82%	2.62%	0	0	3	0
180	0.21%	1.28%	0	0	2	1
202.5	0.03%	0.55%	0	0	2	0
225	0.03%	0.34%	0	0	2	0
247.5	0.02%	0.31%	0	0	2	0
270	0.06%	0.25%	0	0	2	0
292.5	0.07%	0.16%	0	0	2	0
315	0.13%	0.12%	0	0	2	1
337.5	1.73%	1.36%	3	0	2	0

Figure 5.2-2a. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet Season, 300 mg/m³ Threshold) in relation to time-weighted population.



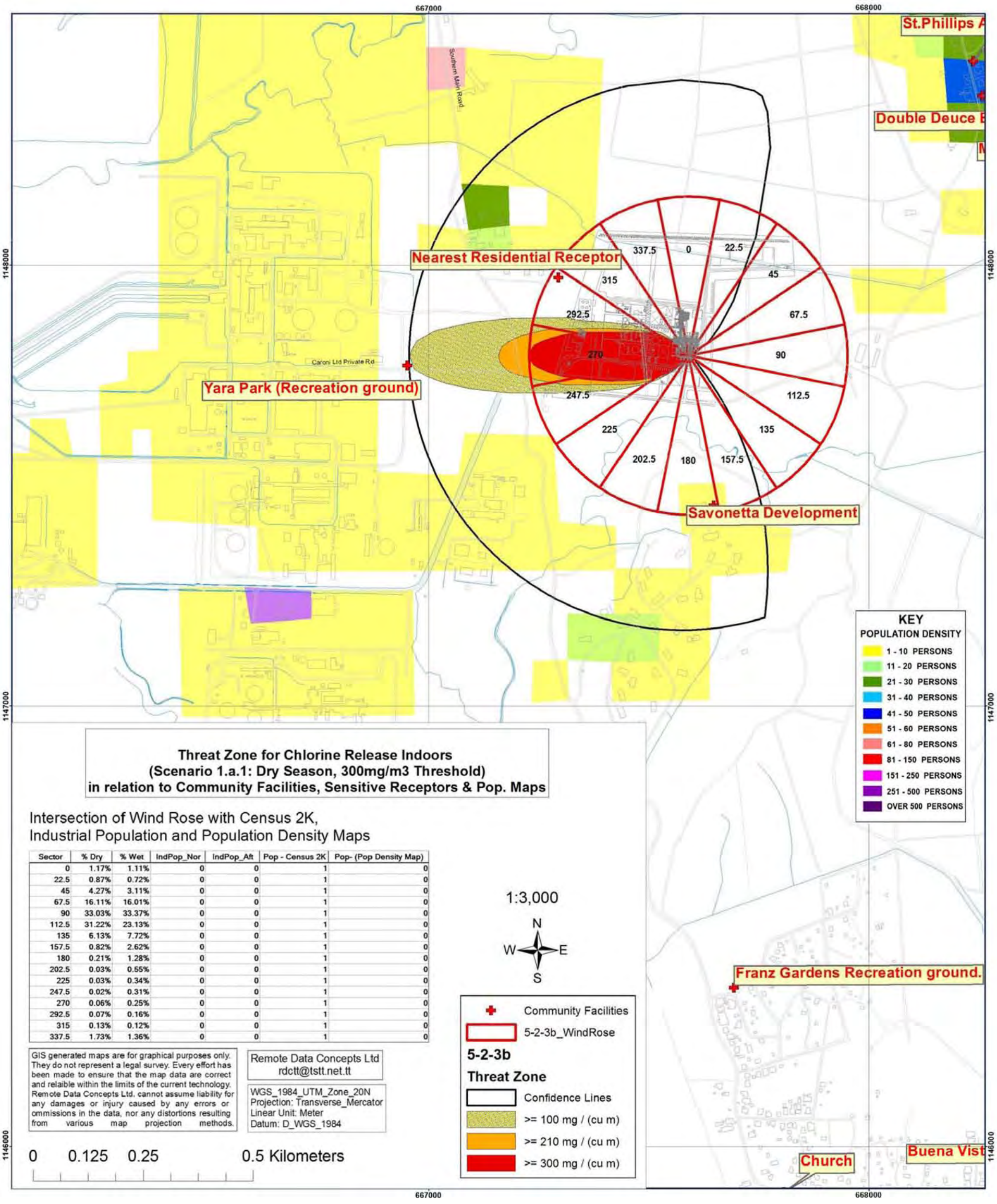
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop -(Pop Density Map)
0	1.17%	1.11%	0	0	2	0
22.5	0.87%	0.72%	0	0	2	0
45	4.27%	3.11%	0	0	2	0
67.5	16.11%	16.01%	0	0	3	0
90	33.03%	33.37%	0	0	8	0
112.5	31.22%	23.13%	0	0	5	0
135	6.13%	7.72%	0	0	3	0
157.5	0.82%	2.62%	0	0	3	0
180	0.21%	1.28%	0	0	2	1
202.5	0.03%	0.55%	0	0	2	0
225	0.03%	0.34%	0	0	2	0
247.5	0.02%	0.31%	0	0	2	0
270	0.06%	0.25%	0	0	2	0
292.5	0.07%	0.16%	0	0	2	0
315	0.13%	0.12%	0	0	2	1
337.5	1.73%	1.36%	3	0	2	0

Figure 5.2-2b. Threat zone for chlorine release, indoors (Scenario 1.a.1: Wet Season, 300 mg/m³ Threshold) in relation to community facilities and sensitive receptors.



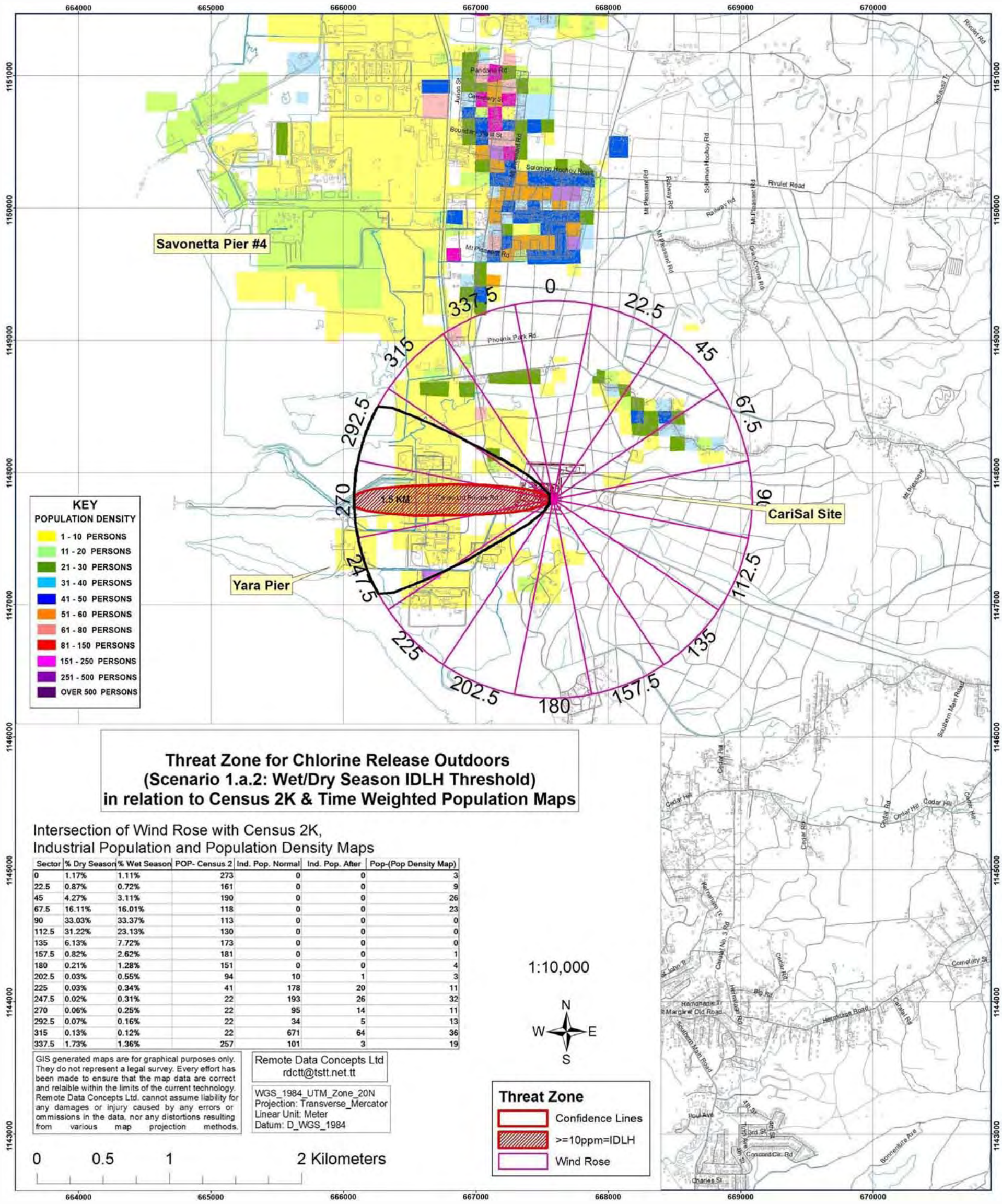
Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop- (Pop Density Map)
0	1.17%	1.11%	0.02567	0	0	1	0
22.5	0.87%	0.72%	0.025669	0	0	1	0
45	4.27%	3.11%	0.025669	0	0	1	0
67.5	16.11%	16.01%	0.025669	0	0	1	0
90	33.03%	33.37%	0.025669	0	0	1	0
112.5	31.22%	23.13%	0.02567	0	0	1	0
135	6.13%	7.72%	0.02567	0	0	1	0
157.5	0.82%	2.62%	0.025671	0	0	1	0
180	0.21%	1.28%	0.025672	0	0	1	0
202.5	0.03%	0.55%	0.025673	0	0	1	0
225	0.03%	0.34%	0.025674	0	0	1	0
247.5	0.02%	0.31%	0.025674	0	0	1	0
270	0.06%	0.25%	0.025674	0	0	1	0
292.5	0.07%	0.16%	0.025673	0	0	1	0
315	0.13%	0.12%	0.025672	0	0	1	0
337.5	1.73%	1.36%	0.025671	0	0	1	0

Figure 5.2-3a. Threat zone for chlorine release, indoors (Scenario 1.a.1: Dry Season, 300 mg/m³ Threshold) in relation to time-weighted population.



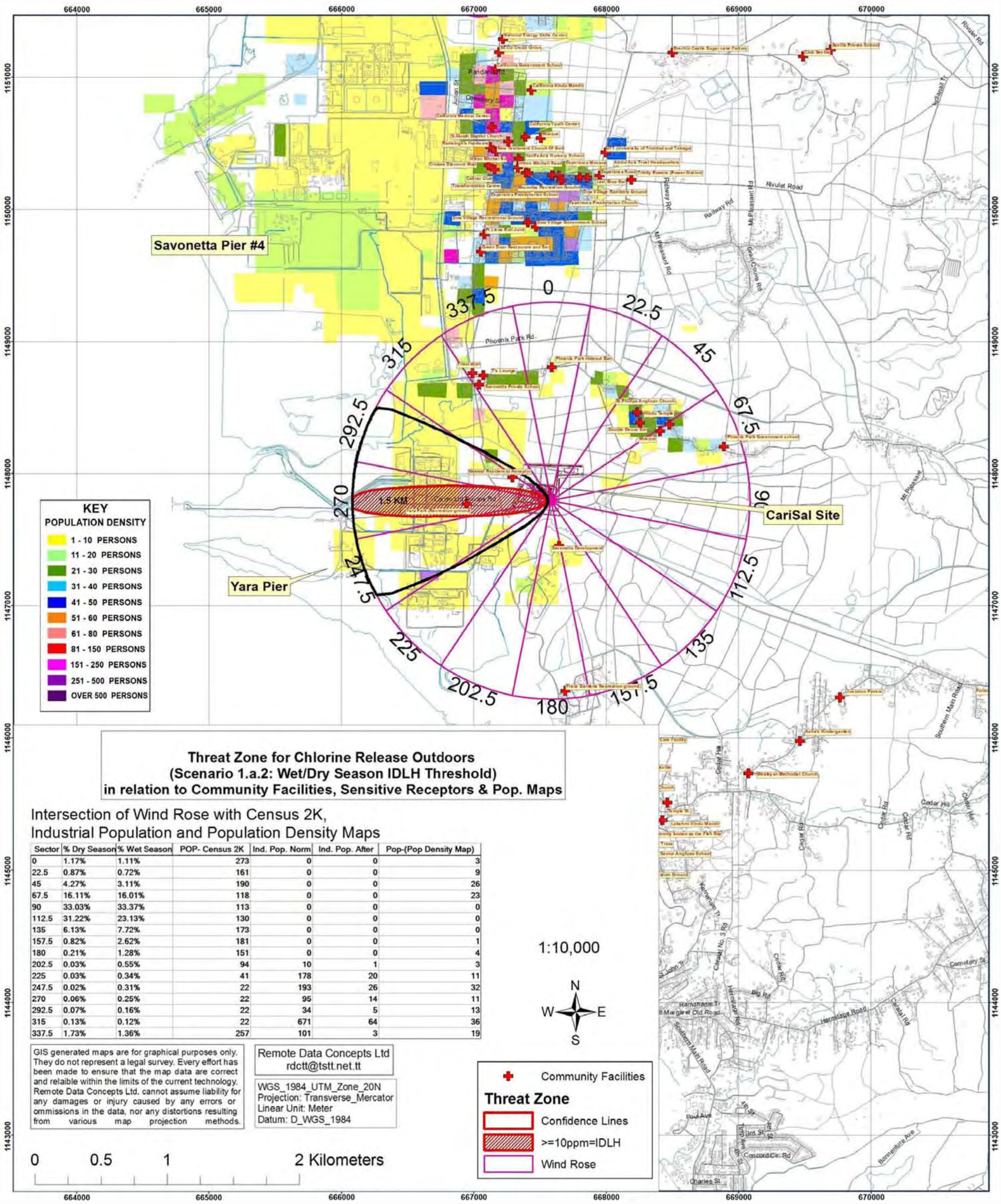
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop- (Pop Density Map)
0	1.17%	1.11%	0	0	1	0
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	0
315	0.13%	0.12%	0	0	1	0
337.5	1.73%	1.36%	0	0	1	0

Figure 5.2-3b. Threat zone for chlorine release, indoors (Scenario 1.a.1: Dry Season, 300 mg/m³ Threshold) in relation to community facilities and sensitive receptors.



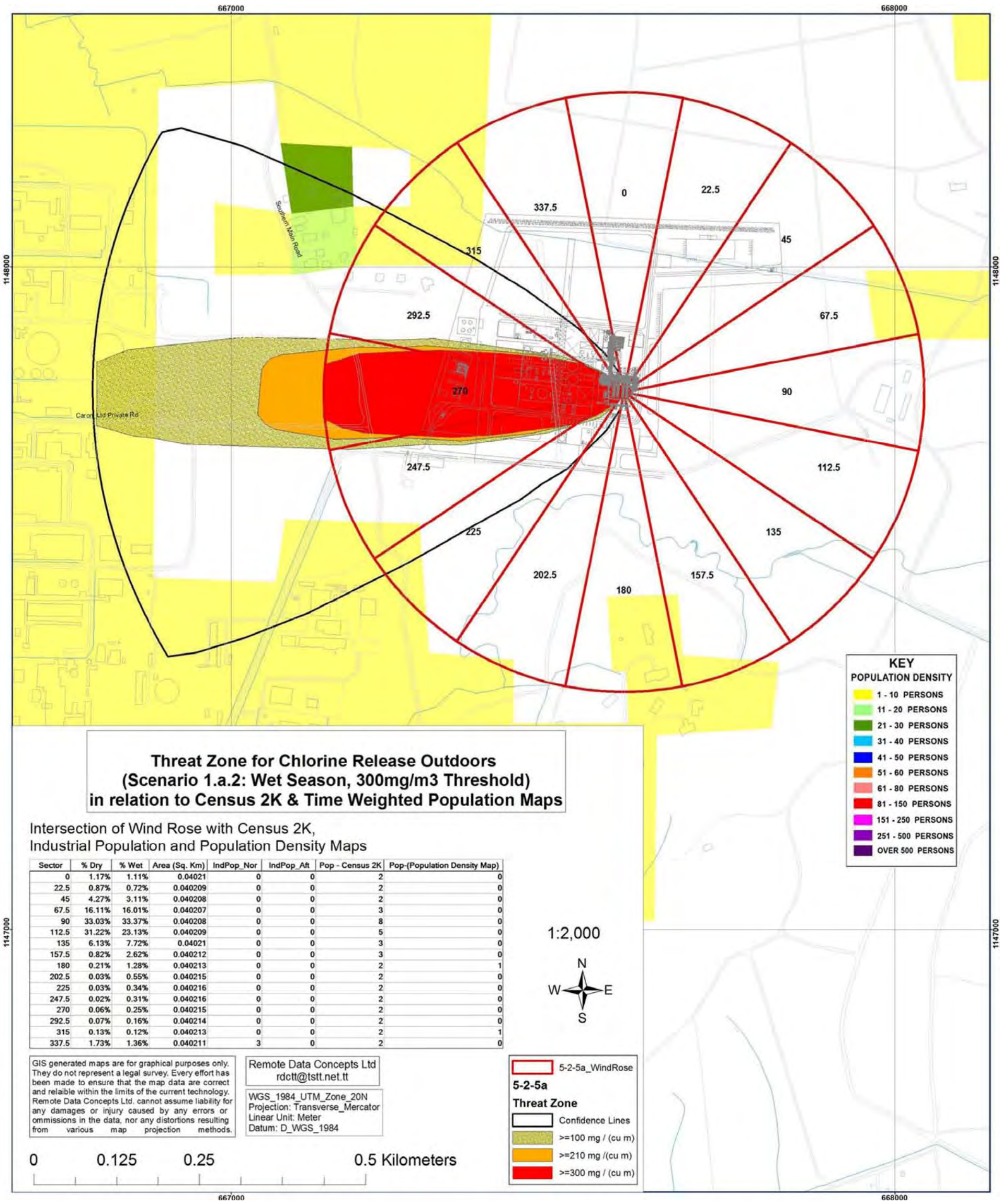
Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop-(Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	161	0	0	9
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure 5.2-4a. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet/Dry Season, IDLH Threshold) in relation to time-weighted population.



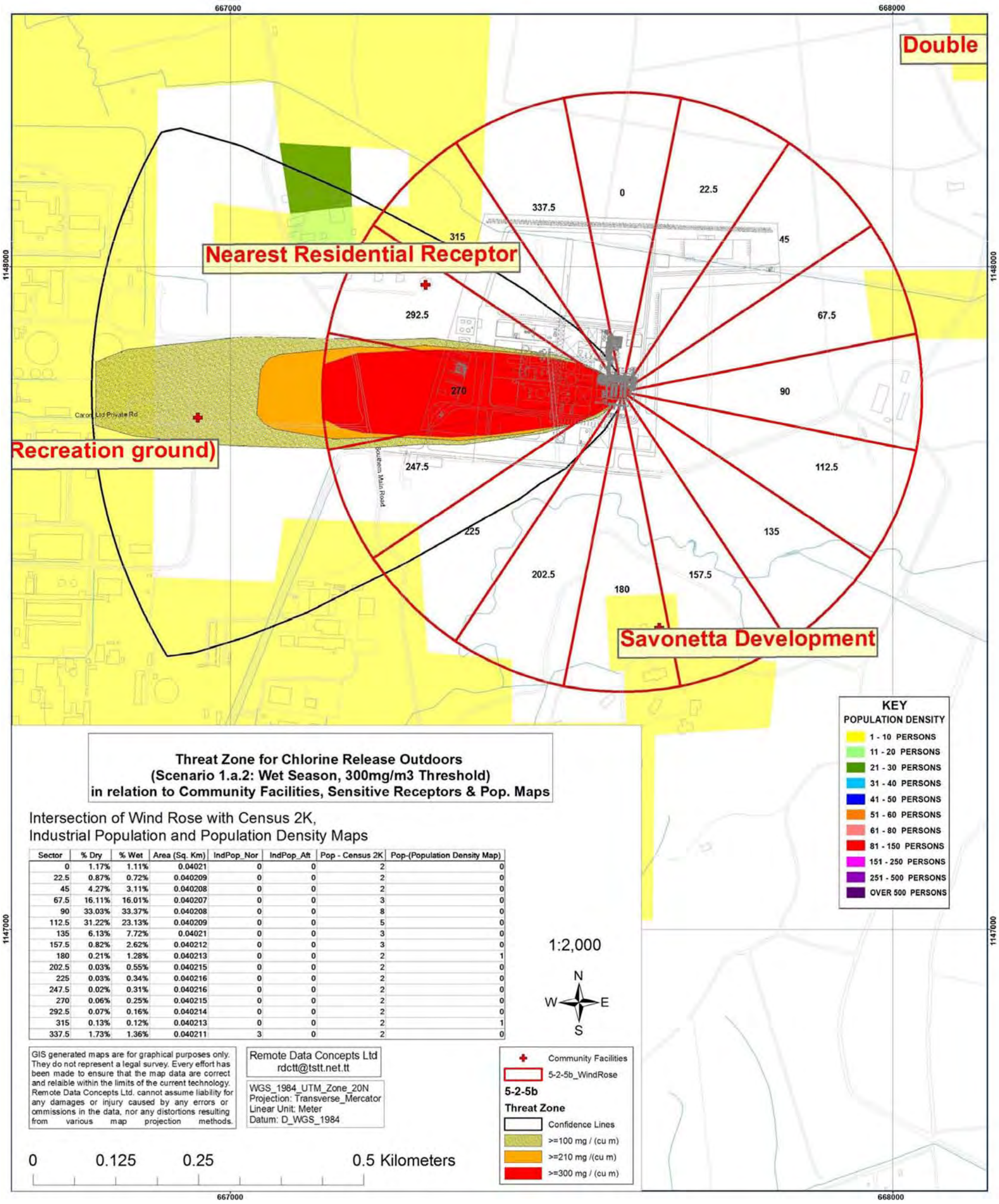
Sector	% Dry Season	% Wet Season	POP- Census 2K	Ind. Pop. Norm	Ind. Pop. After	Pop-(Pop Density Map)
0	1.17%	1.11%	273	0	0	3
22.5	0.87%	0.72%	161	0	0	9
45	4.27%	3.11%	190	0	0	26
67.5	16.11%	16.01%	118	0	0	23
90	33.03%	33.37%	113	0	0	0
112.5	31.22%	23.13%	130	0	0	0
135	6.13%	7.72%	173	0	0	0
157.5	0.82%	2.62%	181	0	0	1
180	0.21%	1.28%	151	0	0	4
202.5	0.03%	0.55%	94	10	1	3
225	0.03%	0.34%	41	178	20	11
247.5	0.02%	0.31%	22	193	26	32
270	0.06%	0.25%	22	95	14	11
292.5	0.07%	0.16%	22	34	5	13
315	0.13%	0.12%	22	671	64	36
337.5	1.73%	1.36%	257	101	3	19

Figure 5.2-4b. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet/Dry Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



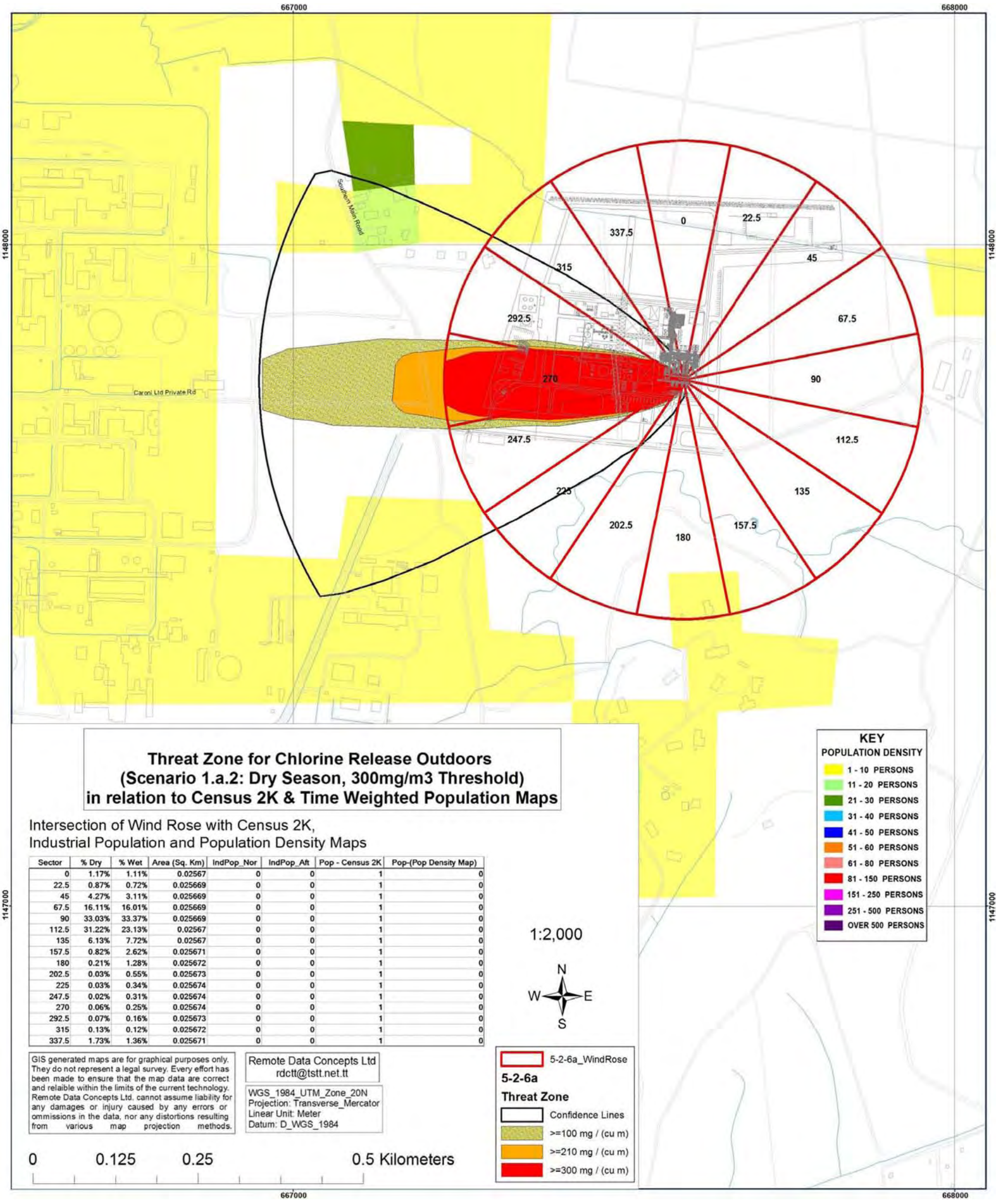
Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Population Density Map)
0	1.17%	1.11%	0.04021	0	0	2	0
22.5	0.87%	0.72%	0.040209	0	0	2	0
45	4.27%	3.11%	0.040208	0	0	2	0
67.5	16.11%	16.01%	0.040207	0	0	3	0
90	33.03%	33.37%	0.040208	0	0	8	0
112.5	31.22%	23.13%	0.040209	0	0	5	0
135	6.13%	7.72%	0.04021	0	0	3	0
157.5	0.82%	2.62%	0.040212	0	0	3	0
180	0.21%	1.28%	0.040213	0	0	2	1
202.5	0.03%	0.55%	0.040215	0	0	2	0
225	0.03%	0.34%	0.040216	0	0	2	0
247.5	0.02%	0.31%	0.040216	0	0	2	0
270	0.06%	0.25%	0.040215	0	0	2	0
292.5	0.07%	0.16%	0.040214	0	0	2	0
315	0.13%	0.12%	0.040213	0	0	2	1
337.5	1.73%	1.36%	0.040211	3	0	2	0

Figure 5.2-5a. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet Season, 300 mg/m3 Threshold) in relation to time-weighted population.



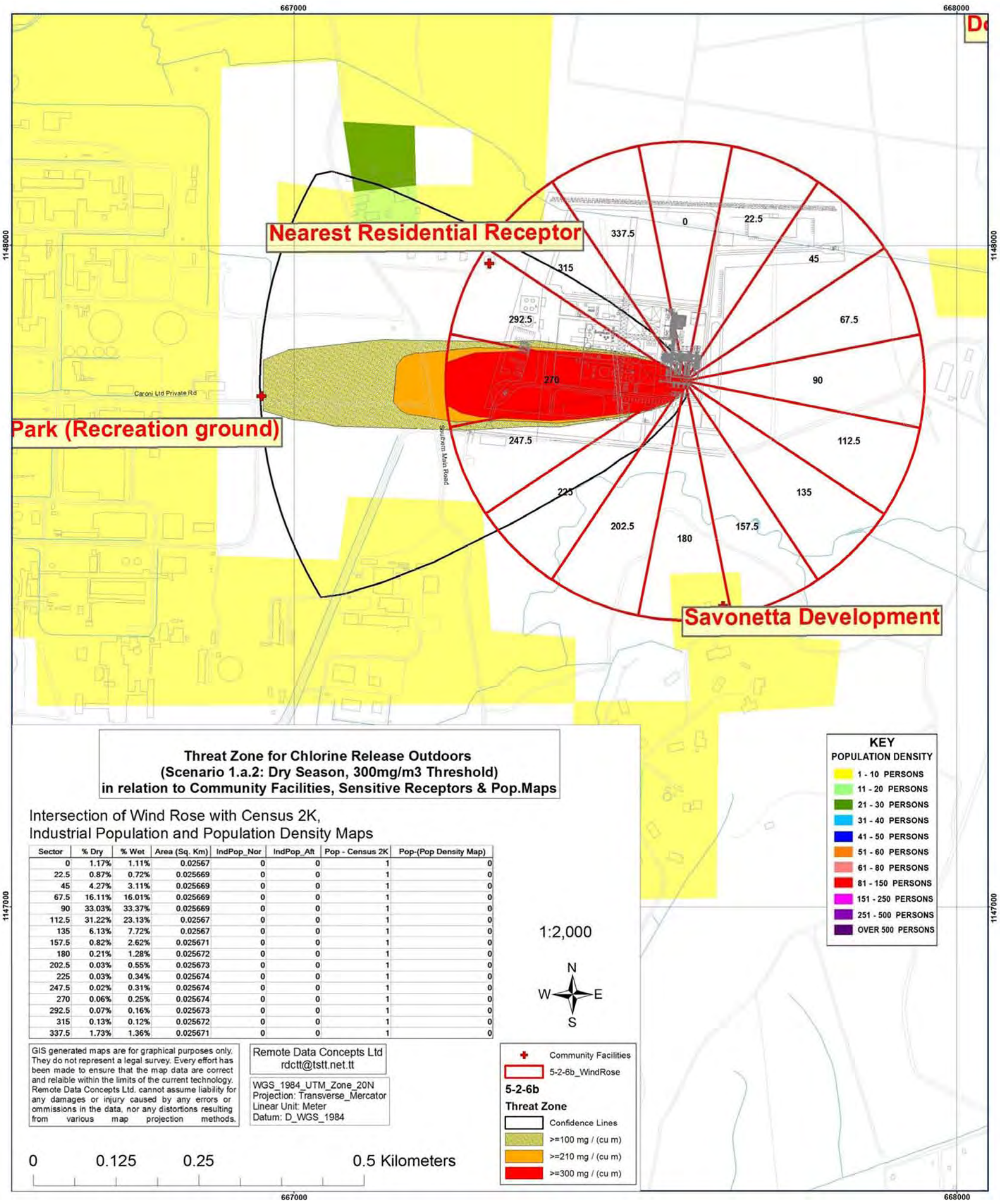
Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Population Density Map)
0	1.17%	1.11%	0.04021	0	0	2	0
22.5	0.87%	0.72%	0.040209	0	0	2	0
45	4.27%	3.11%	0.040208	0	0	2	0
67.5	16.11%	16.01%	0.040207	0	0	3	0
90	33.03%	33.37%	0.040208	0	0	8	0
112.5	31.22%	23.13%	0.040209	0	0	5	0
135	6.13%	7.72%	0.04021	0	0	3	0
157.5	0.82%	2.62%	0.040212	0	0	3	0
180	0.21%	1.28%	0.040213	0	0	2	1
202.5	0.03%	0.55%	0.040215	0	0	2	0
225	0.03%	0.34%	0.040216	0	0	2	0
247.5	0.02%	0.31%	0.040216	0	0	2	0
270	0.06%	0.25%	0.040215	0	0	2	0
292.5	0.07%	0.16%	0.040214	0	0	2	0
315	0.13%	0.12%	0.040213	0	0	2	1
337.5	1.73%	1.36%	0.040211	3	0	2	0

Figure 5.2-5b. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Wet Season, 300 mg/m3 Threshold) in relation to community facilities and sensitive receptors.



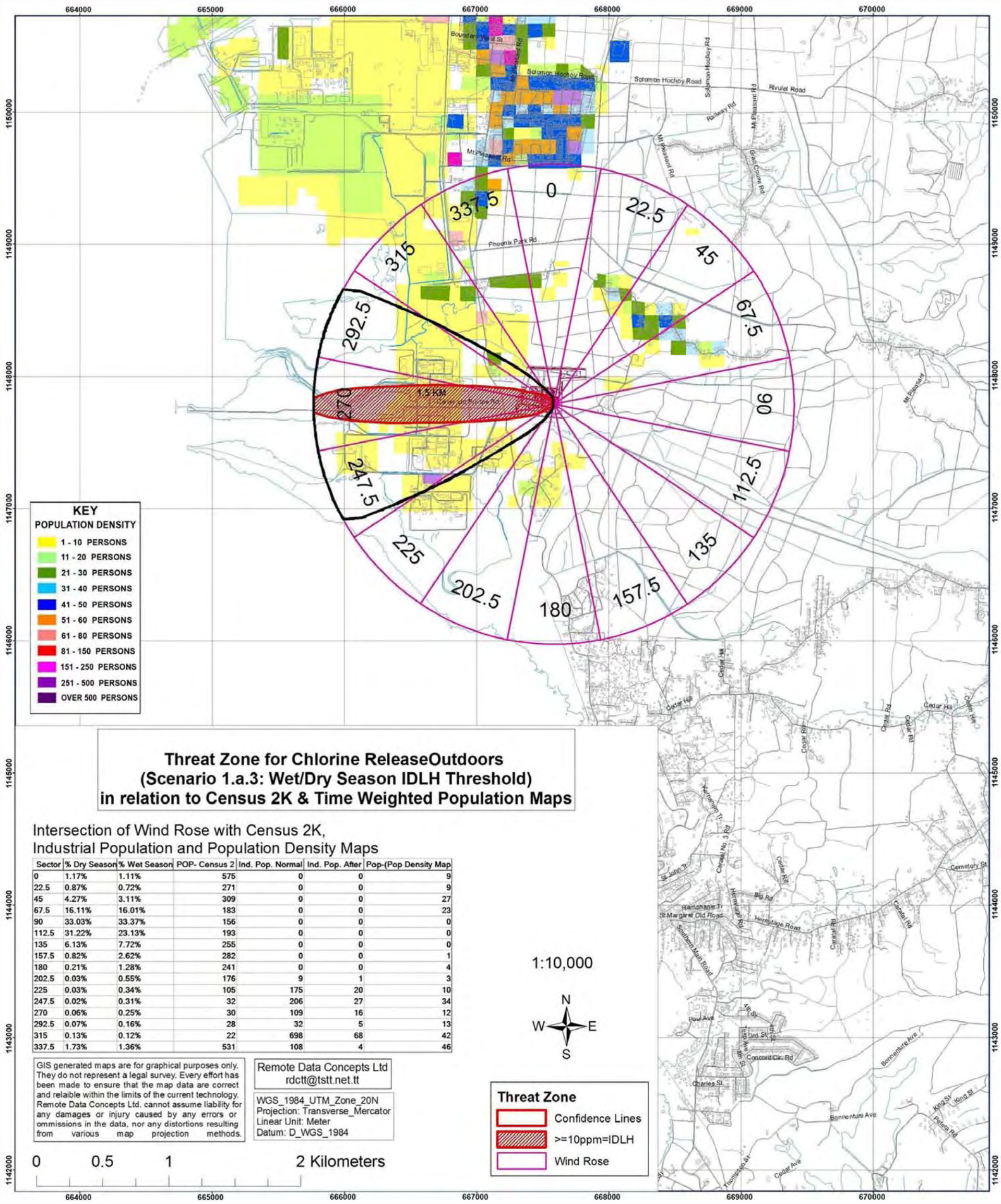
Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0.02567	0	0	1	0
22.5	0.87%	0.72%	0.025669	0	0	1	0
45	4.27%	3.11%	0.025669	0	0	1	0
67.5	16.11%	16.01%	0.025669	0	0	1	0
90	33.03%	33.37%	0.025669	0	0	1	0
112.5	31.22%	23.13%	0.02567	0	0	1	0
135	6.13%	7.72%	0.02567	0	0	1	0
157.5	0.82%	2.62%	0.025671	0	0	1	0
180	0.21%	1.28%	0.025672	0	0	1	0
202.5	0.03%	0.55%	0.025673	0	0	1	0
225	0.03%	0.34%	0.025674	0	0	1	0
247.5	0.02%	0.31%	0.025674	0	0	1	0
270	0.06%	0.25%	0.025674	0	0	1	0
292.5	0.07%	0.16%	0.025673	0	0	1	0
315	0.13%	0.12%	0.025672	0	0	1	0
337.5	1.73%	1.36%	0.025671	0	0	1	0

Figure 5.2-6a. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Dry Season, 300 mg/m3 Threshold) in relation to time-weighted population.



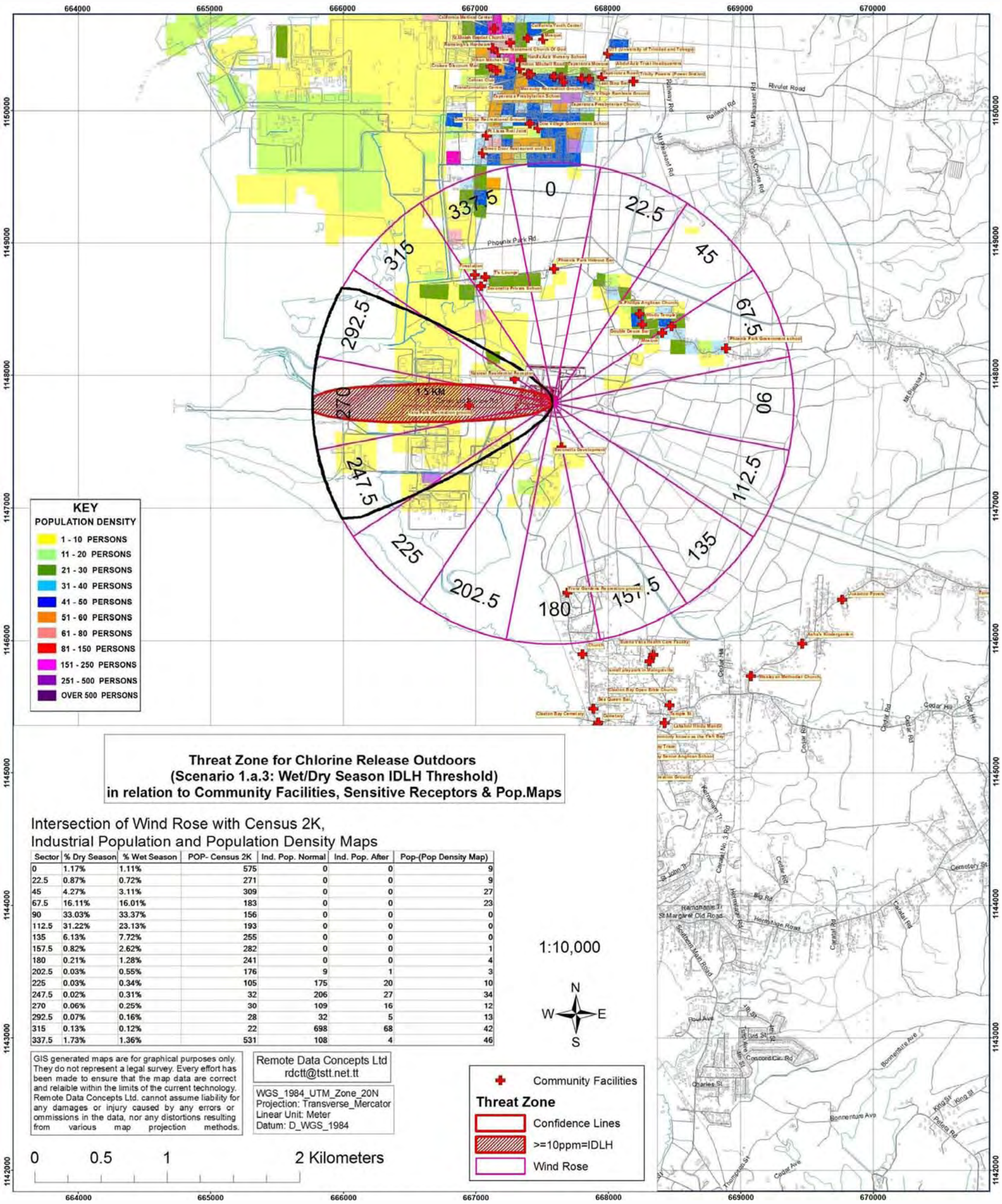
Sector	% Dry	% Wet	Area (Sq. Km)	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0.02567	0	0	1	0
22.5	0.87%	0.72%	0.025669	0	0	1	0
45	4.27%	3.11%	0.025669	0	0	1	0
67.5	16.11%	16.01%	0.025669	0	0	1	0
90	33.03%	33.37%	0.025669	0	0	1	0
112.5	31.22%	23.13%	0.02567	0	0	1	0
135	6.13%	7.72%	0.02567	0	0	1	0
157.5	0.82%	2.62%	0.025671	0	0	1	0
180	0.21%	1.28%	0.025672	0	0	1	0
202.5	0.03%	0.55%	0.025673	0	0	1	0
225	0.03%	0.34%	0.025674	0	0	1	0
247.5	0.02%	0.31%	0.025674	0	0	1	0
270	0.06%	0.25%	0.025674	0	0	1	0
292.5	0.07%	0.16%	0.025673	0	0	1	0
315	0.13%	0.12%	0.025672	0	0	1	0
337.5	1.73%	1.36%	0.025671	0	0	1	0

Figure 5.2-6b. Threat zone for chlorine release, outdoors (Scenario 1.a.2: Dry Season, 300 mg/m3 Threshold) in relation to community facilities and sensitive receptors.



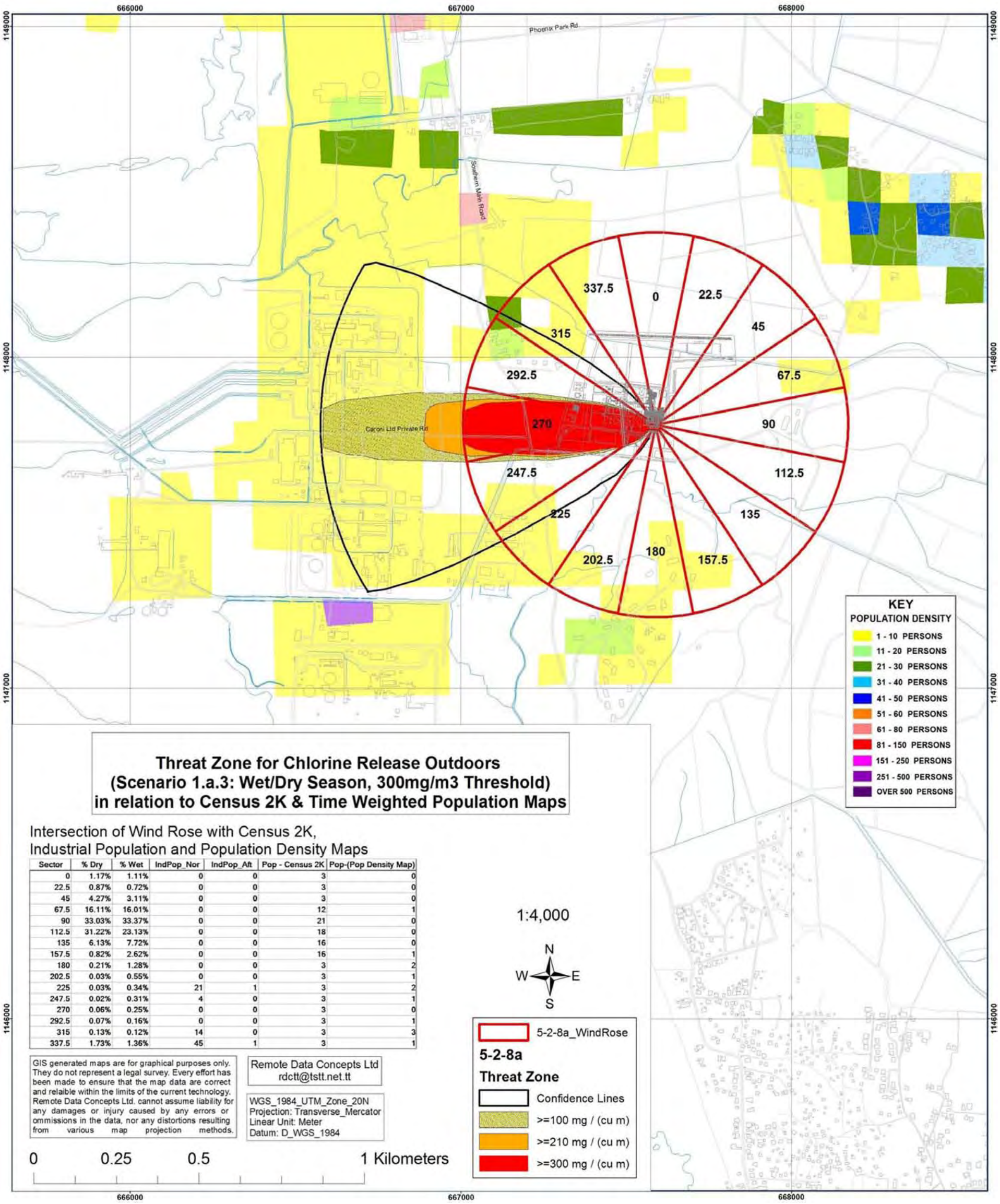
Sector	% Dry Season	% Wet Season	POP- Census 2	Ind. Pop. Normal	Ind. Pop. After	Pop-(Pop Density Map
0	1.17%	1.11%	575	0	0	9
22.5	0.87%	0.72%	271	0	0	9
45	4.27%	3.11%	309	0	0	27
67.5	16.11%	16.01%	183	0	0	23
90	33.03%	33.37%	156	0	0	0
112.5	31.22%	23.13%	193	0	0	0
135	6.13%	7.72%	255	0	0	0
157.5	0.82%	2.62%	282	0	0	1
180	0.21%	1.28%	241	0	0	4
202.5	0.03%	0.55%	176	9	1	3
225	0.03%	0.34%	105	175	20	10
247.5	0.02%	0.31%	32	206	27	34
270	0.06%	0.25%	30	109	16	12
292.5	0.07%	0.16%	28	32	5	13
315	0.13%	0.12%	22	698	68	42
337.5	1.73%	1.36%	531	108	4	46

Figure 5.2-7a. Threat zone for chlorine release, outdoors (Scenario 1.a.3: Wet/Dry Season, IDLH Threshold) in relation to time-weighted population.



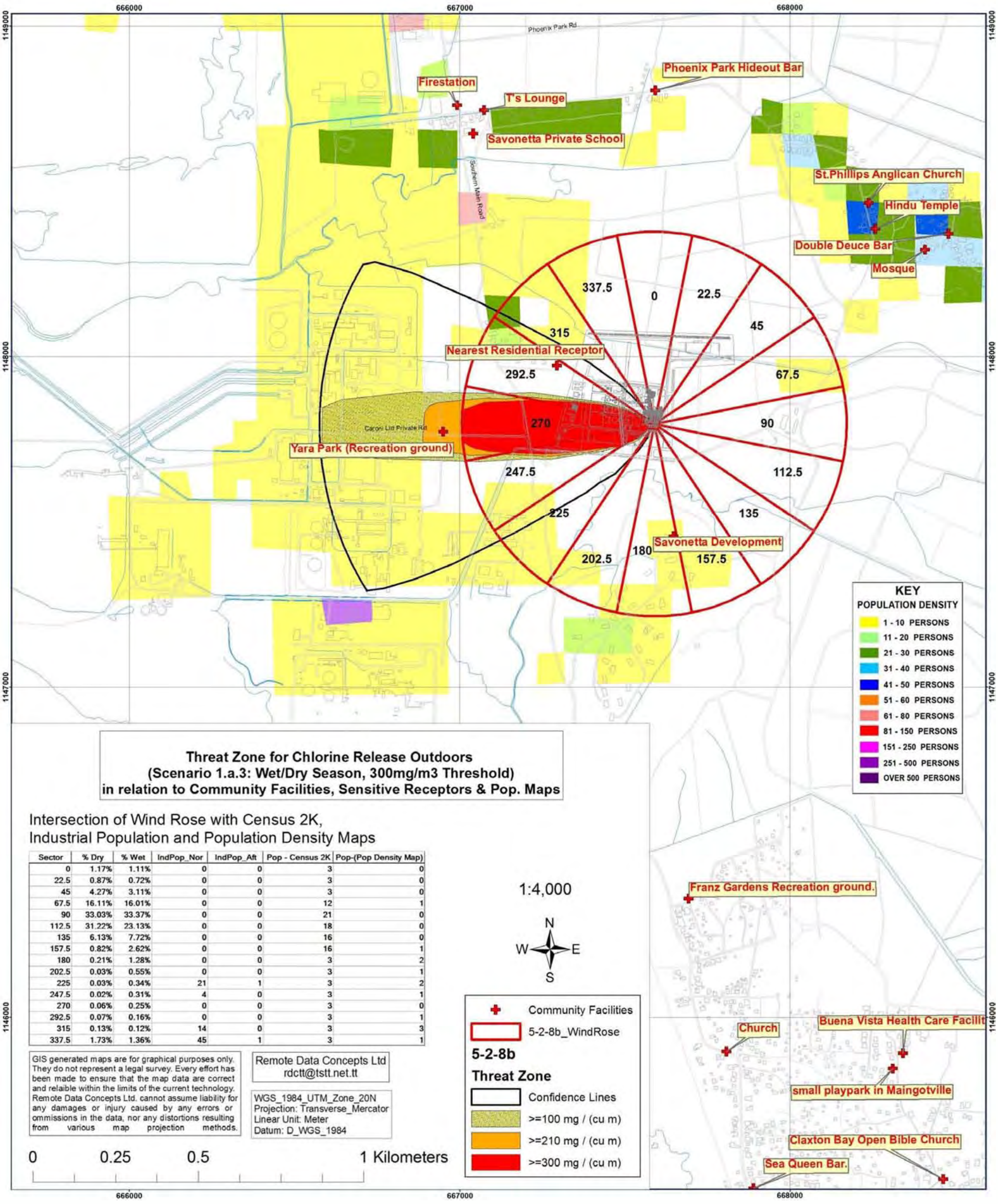
Sector	% Dry Season	% Wet Season	POP- Census 2K	Ind. Pop. Normal	Ind. Pop. After	Pop-(Pop Density Map)
0	1.17%	1.11%	575	0	0	9
22.5	0.87%	0.72%	271	0	0	9
45	4.27%	3.11%	309	0	0	27
67.5	16.11%	16.01%	183	0	0	23
90	33.03%	33.37%	156	0	0	0
112.5	31.22%	23.13%	193	0	0	0
135	6.13%	7.72%	255	0	0	0
157.5	0.82%	2.62%	282	0	0	1
180	0.21%	1.28%	241	0	0	4
202.5	0.03%	0.55%	176	9	1	3
225	0.03%	0.34%	105	175	20	10
247.5	0.02%	0.31%	32	206	27	34
270	0.06%	0.25%	30	109	16	12
292.5	0.07%	0.16%	28	32	5	13
315	0.13%	0.12%	22	698	68	42
337.5	1.73%	1.36%	531	108	4	46

Figure 5.2-7b. Threat zone for chlorine release, outdoors (Scenario 1.a.3: Wet/Dry Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0	0	3	0
22.5	0.87%	0.72%	0	0	3	0
45	4.27%	3.11%	0	0	3	0
67.5	16.11%	16.01%	0	0	12	1
90	33.03%	33.37%	0	0	21	0
112.5	31.22%	23.13%	0	0	18	0
135	6.13%	7.72%	0	0	16	0
157.5	0.82%	2.62%	0	0	16	1
180	0.21%	1.28%	0	0	3	2
202.5	0.03%	0.55%	0	0	3	1
225	0.03%	0.34%	21	1	3	2
247.5	0.02%	0.31%	4	0	3	1
270	0.06%	0.25%	0	0	3	0
292.5	0.07%	0.16%	0	0	3	1
315	0.13%	0.12%	14	0	3	3
337.5	1.73%	1.36%	45	1	3	1

Figure 5.2-8a. Threat zone for chlorine release, outdoors (Scenario 1.a.3: Wet/Dry Season. 300 mg/m3 Threshold) in relation to time-weighted population.



Threat Zone for Chlorine Release Outdoors
(Scenario 1.a.3: Wet/Dry Season, 300mg/m3 Threshold)
in relation to Community Facilities, Sensitive Receptors & Pop. Maps

Intersection of Wind Rose with Census 2K,
Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0	0	3	0
22.5	0.87%	0.72%	0	0	3	0
45	4.27%	3.11%	0	0	3	0
67.5	16.11%	16.01%	0	0	12	1
90	33.03%	33.37%	0	0	21	0
112.5	31.22%	23.13%	0	0	18	0
135	6.13%	7.72%	0	0	16	0
157.5	0.82%	2.62%	0	0	16	1
180	0.21%	1.28%	0	0	3	2
202.5	0.03%	0.55%	0	0	3	1
225	0.03%	0.34%	21	1	3	2
247.5	0.02%	0.31%	4	0	3	1
270	0.06%	0.25%	0	0	3	0
292.5	0.07%	0.16%	0	0	3	1
315	0.13%	0.12%	14	0	3	3
337.5	1.73%	1.36%	45	1	3	1

1:4,000

N
W E
S

Community Facilities
5-2-8b_WindRose
5-2-8b
Threat Zone
Confidence Lines
>=100 mg / (cu m)
>=210 mg / (cu m)
>=300 mg / (cu m)

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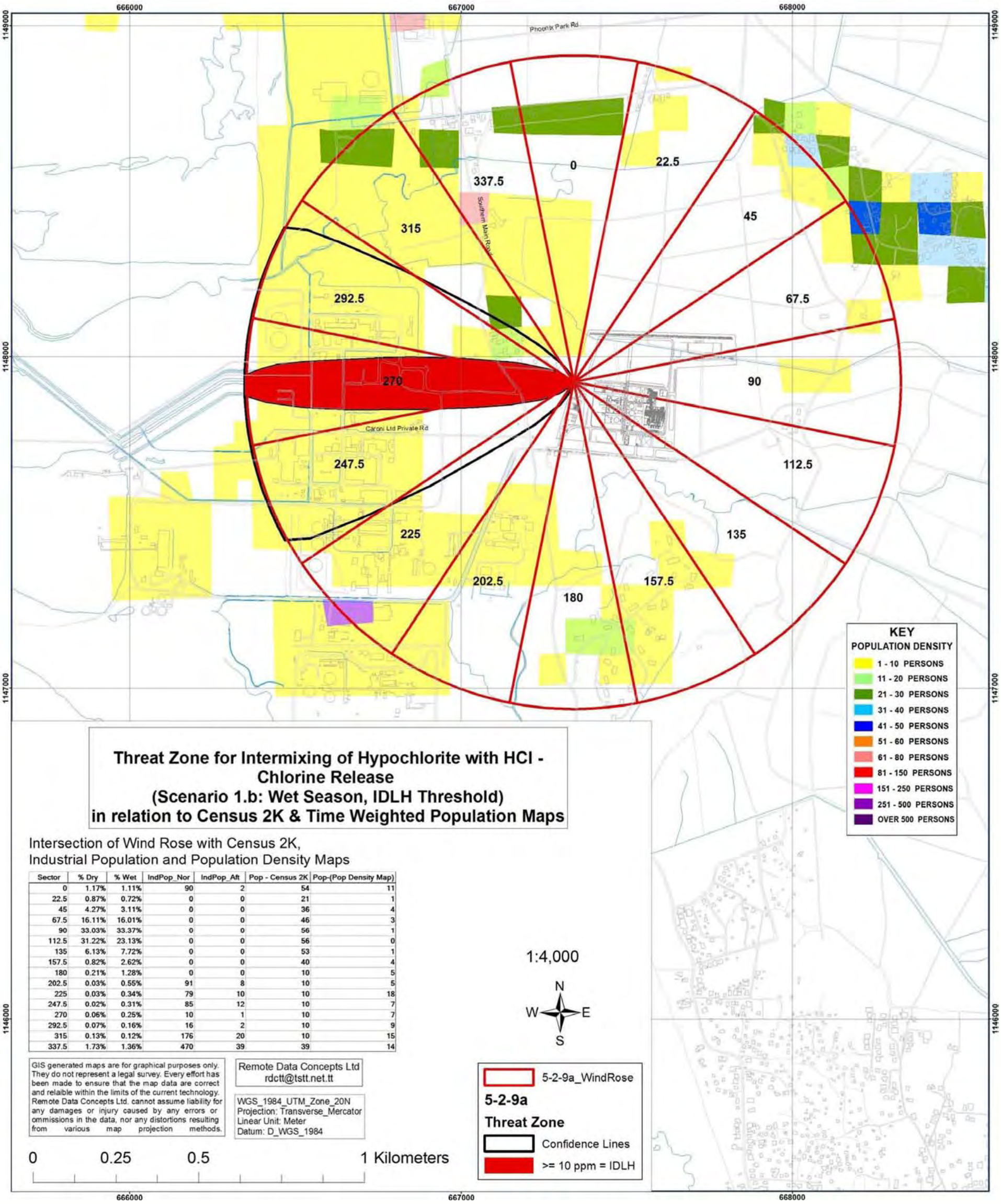
WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

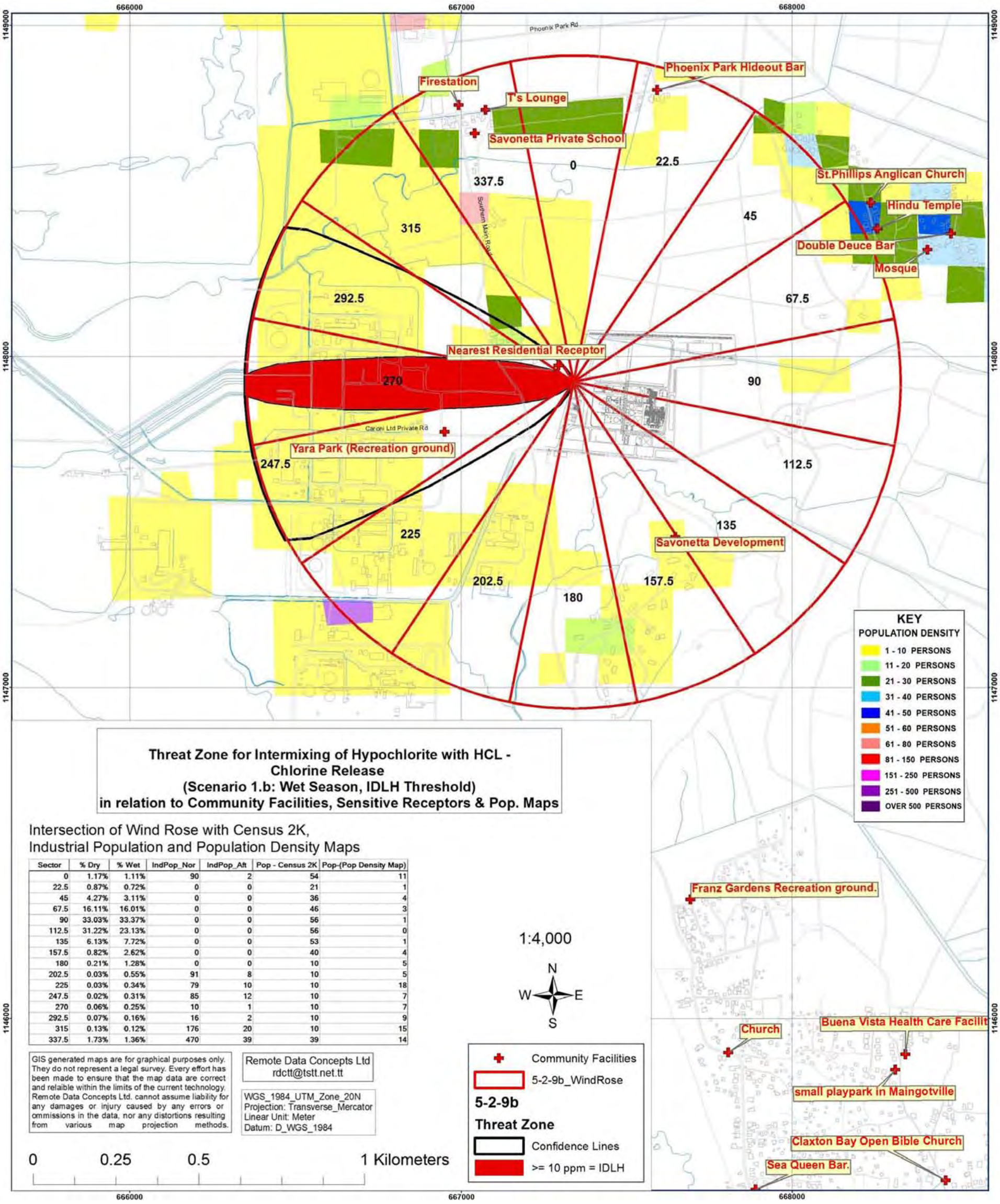
0 0.25 0.5 1 Kilometers

Figure 5.2-8b. Threat zone for chlorine release, outdoors (Scenario 1.a.3: Wet/Dry Season, 300 mg/m3 Threshold) in relation to community facilities and sensitive receptors.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	23.13%	0	0	56	0
135	6.13%	7.72%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.55%	91	8	10	5
225	0.03%	0.34%	79	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	9
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	39	39	14

Figure 5.2-9a. Threat zone for intermixing of hypochlorite with HCl – Chlorine Release, (Scenario 1.b: Wet Season, IDLH Threshold) in relation to time-weighted population.

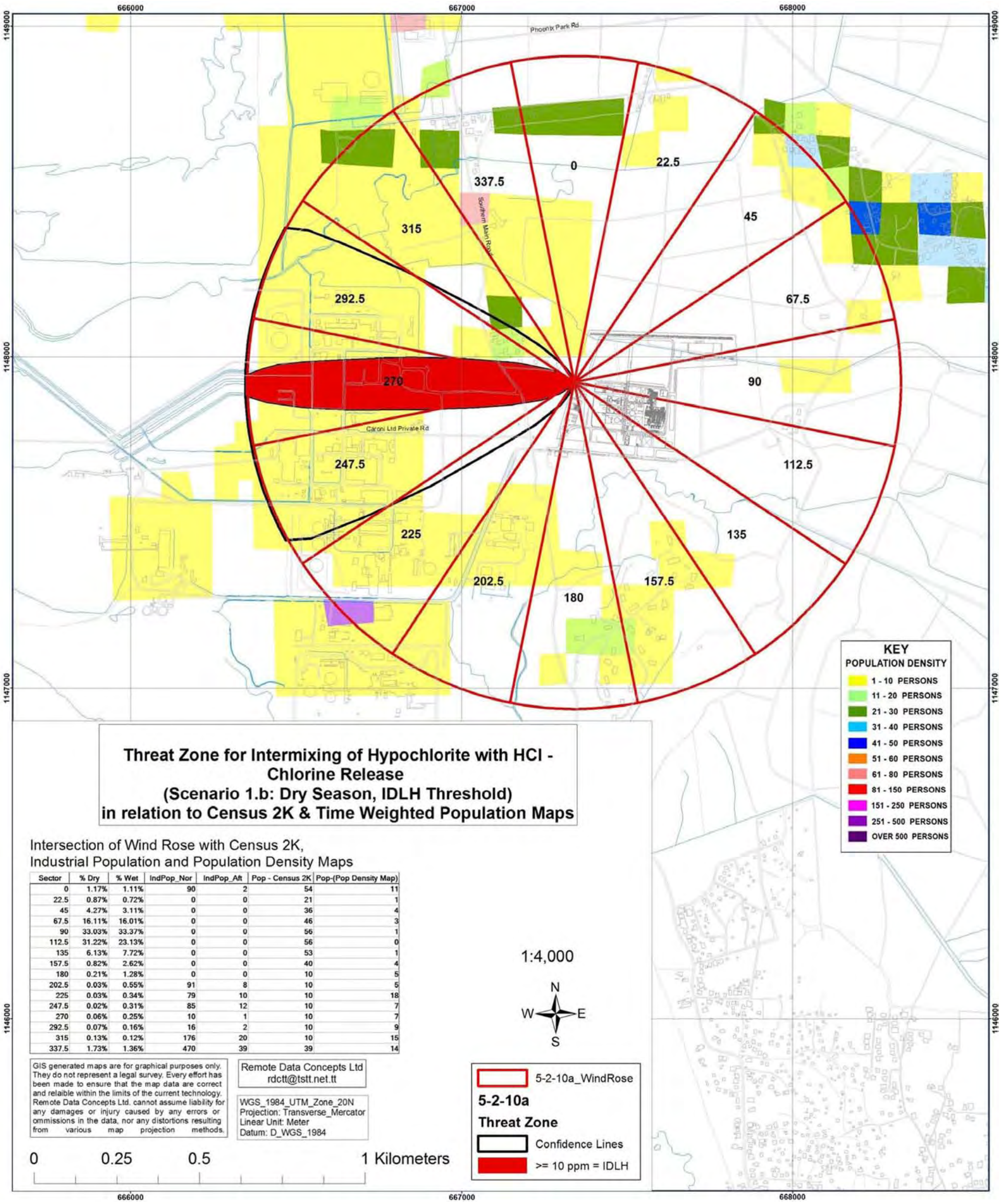


Threat Zone for Intermixing of Hypochlorite with HCL - Chlorine Release (Scenario 1.b: Wet Season, IDLH Threshold) in relation to Community Facilities, Sensitive Receptors & Pop. Maps

Intersection of Wind Rose with Census 2K, Industrial Population and Population Density Maps

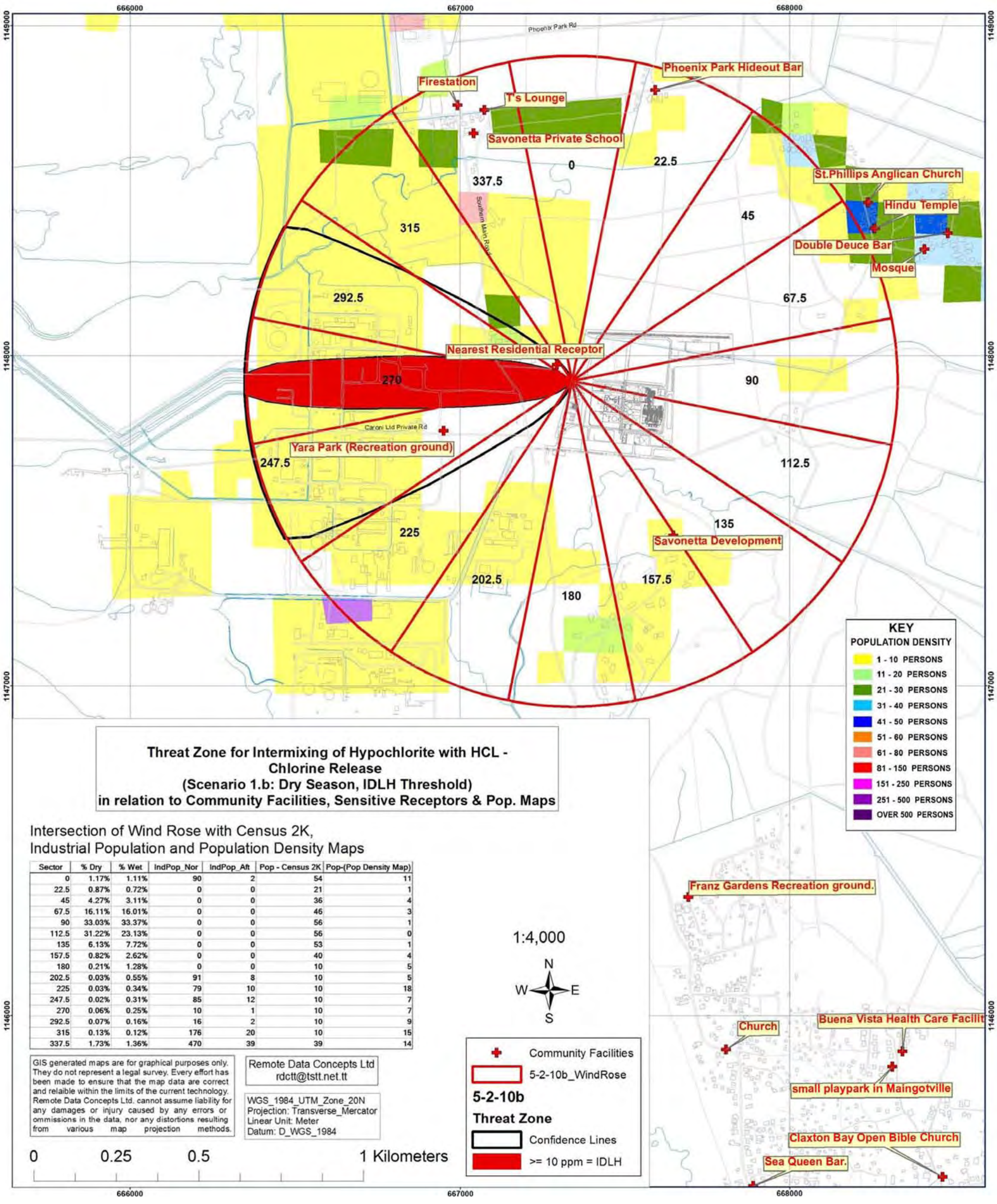
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	23.13%	0	0	56	0
135	6.13%	7.72%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.55%	91	8	10	5
225	0.03%	0.34%	79	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	9
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	39	39	14

Figure 5.2-9b. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release, (Scenario 1.b: Wet Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	23.13%	0	0	56	0
135	6.13%	7.72%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.55%	91	8	10	5
225	0.03%	0.34%	79	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	9
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	39	39	14

Figure 5.2-10a. Threat zone for intermixing of hypochlorite with HCl – Chlorine Release, (Scenario 1.b: Dry Season, IDLH Threshold) in relation to time-weighted population.

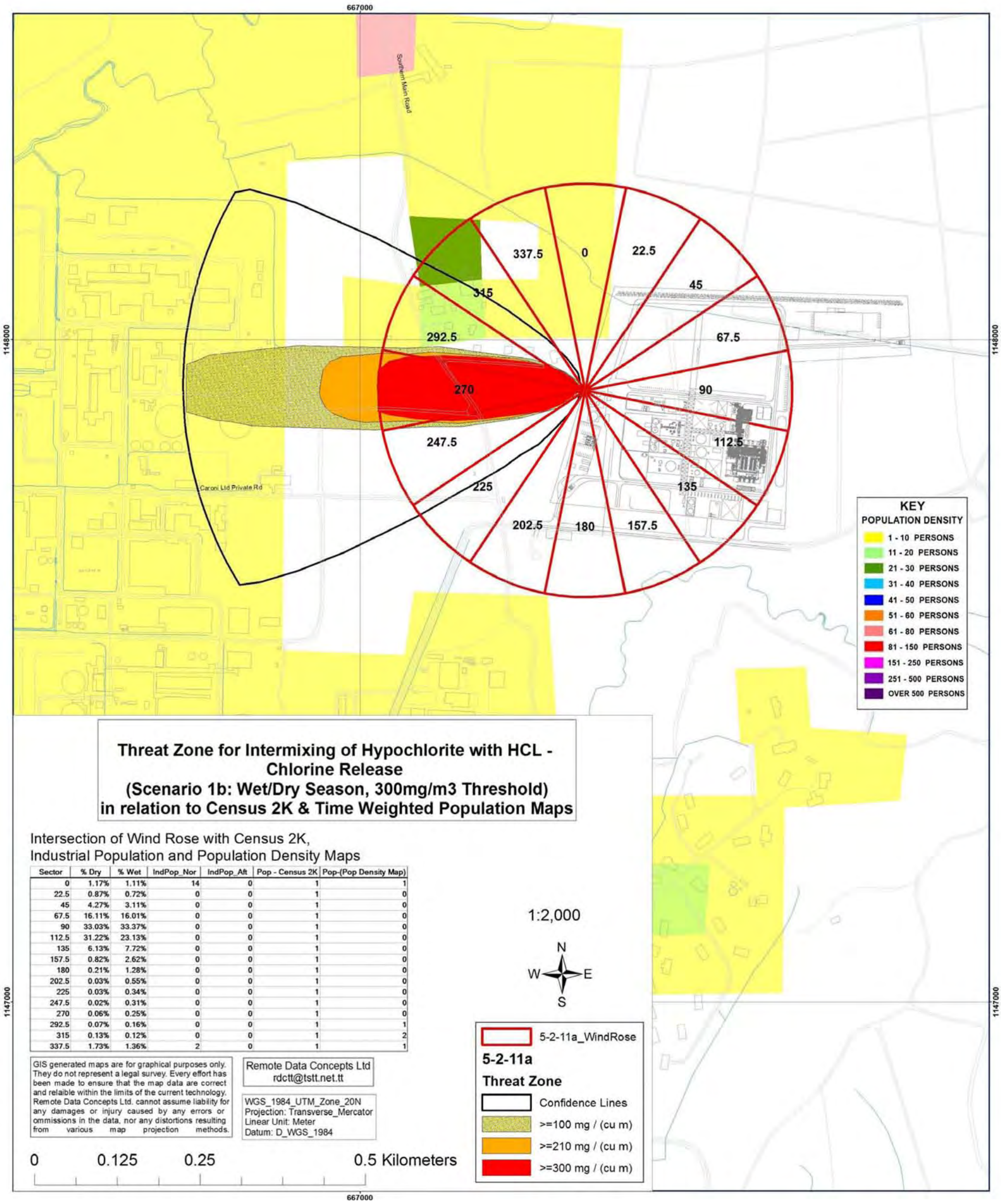


Threat Zone for Intermixing of Hypochlorite with HCL - Chlorine Release (Scenario 1.b: Dry Season, IDLH Threshold) in relation to Community Facilities, Sensitive Receptors & Pop. Maps

Intersection of Wind Rose with Census 2K, Industrial Population and Population Density Maps

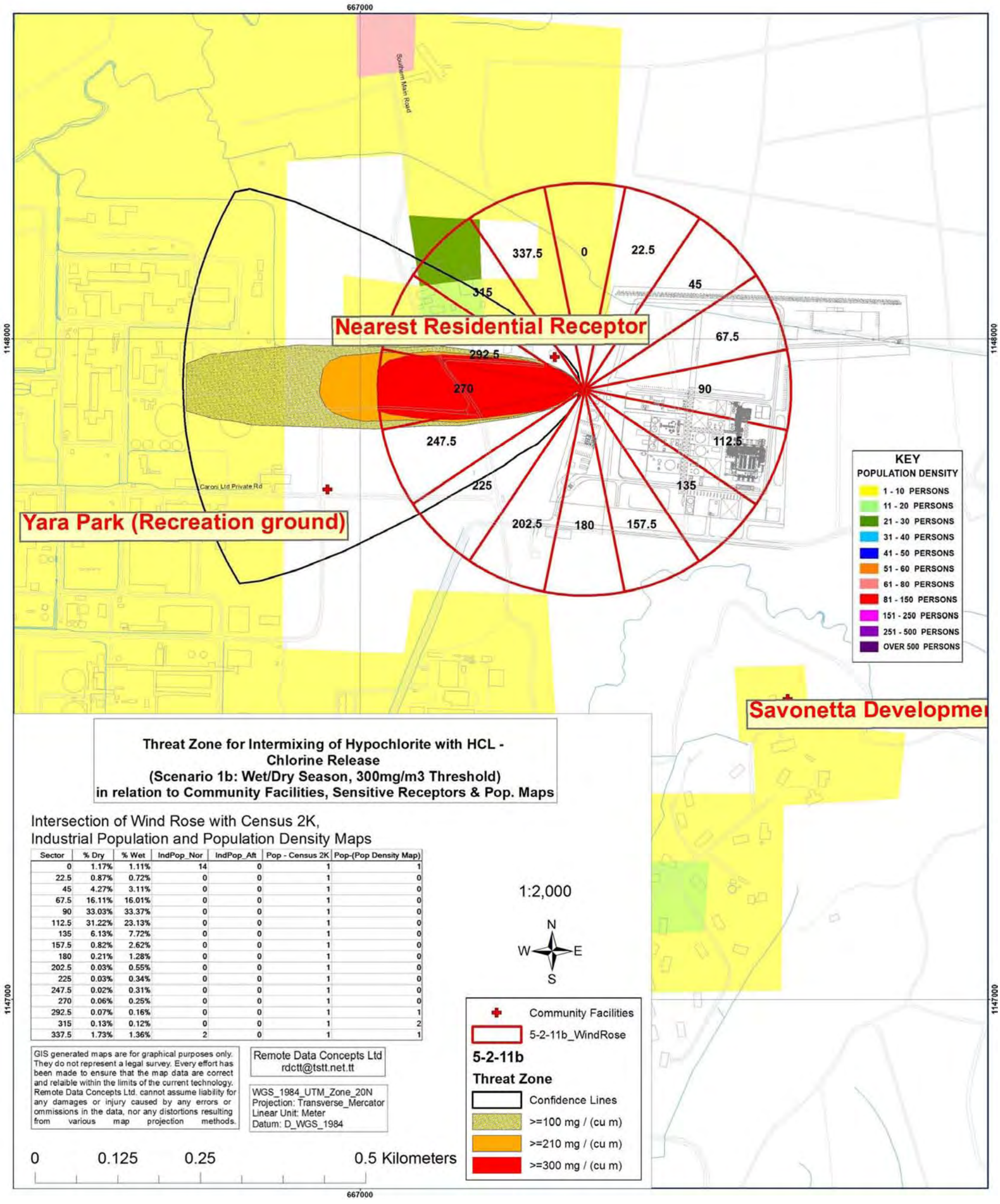
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	54	11
22.5	0.87%	0.72%	0	0	21	1
45	4.27%	3.11%	0	0	36	4
67.5	16.11%	16.01%	0	0	46	3
90	33.03%	33.37%	0	0	56	1
112.5	31.22%	23.13%	0	0	56	0
135	6.13%	7.72%	0	0	53	1
157.5	0.82%	2.62%	0	0	40	4
180	0.21%	1.28%	0	0	10	5
202.5	0.03%	0.55%	91	8	10	5
225	0.03%	0.34%	79	10	10	18
247.5	0.02%	0.31%	85	12	10	7
270	0.06%	0.25%	10	1	10	7
292.5	0.07%	0.16%	16	2	10	9
315	0.13%	0.12%	176	20	10	15
337.5	1.73%	1.36%	470	39	39	14

Figure 5.2-10b. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release, (Scenario 1.b: Dry Season, IDLH Threshold) in relation to community facilities and sensitive receptors.



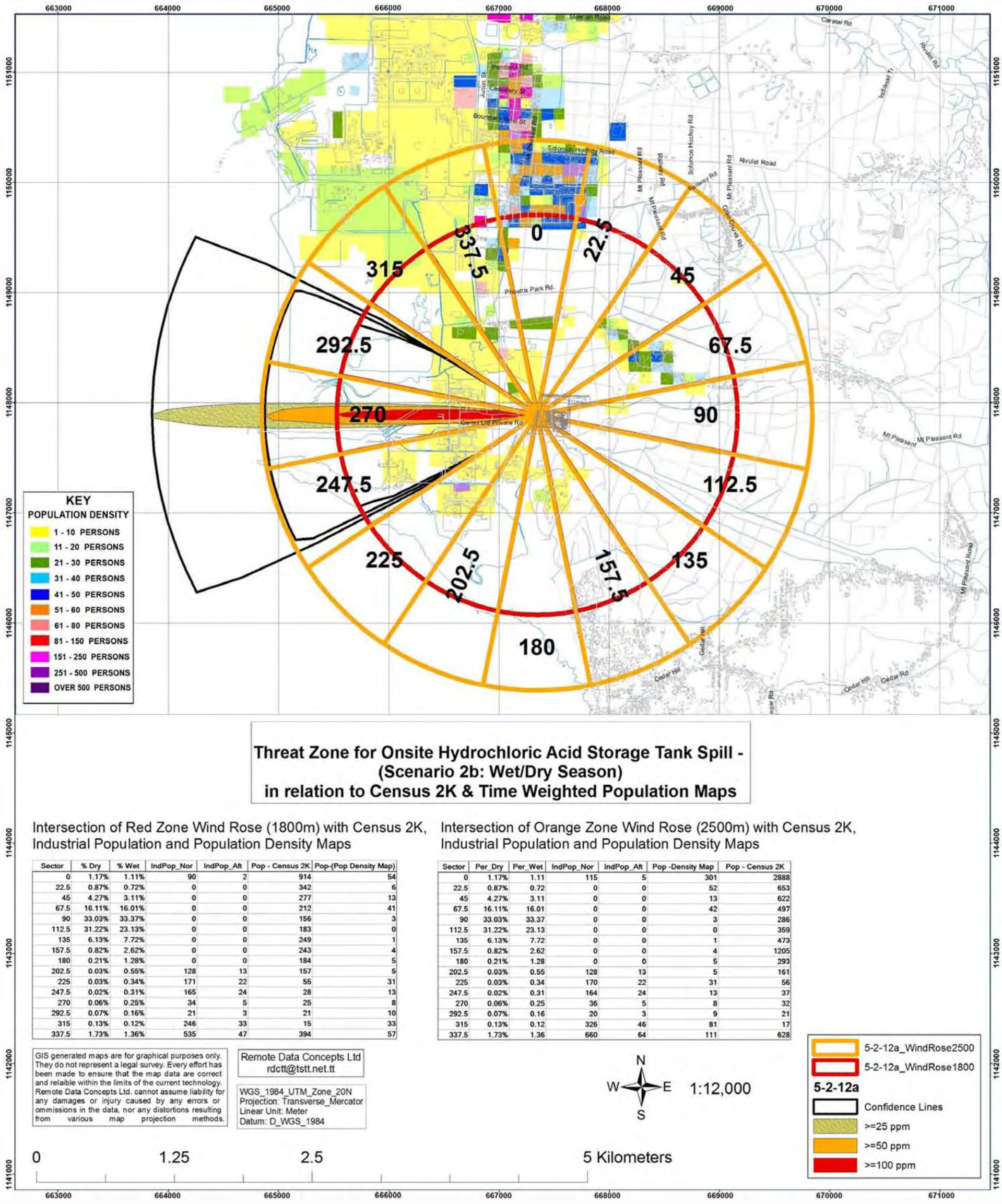
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	14	0	1	1
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	1
315	0.13%	0.12%	0	0	1	2
337.5	1.73%	1.36%	2	0	1	1

Figure 5.2-11a. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release, (Scenario 1.b: Wet/Dry Season 300 mg/m3 Threshold) in relation to time-weighted population.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	14	0	1	1
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	1
315	0.13%	0.12%	0	0	1	2
337.5	1.73%	1.36%	2	0	1	1

Figure 5.2-11 b. Threat zone for intermixing of hypochlorite with HCL – Chlorine Release, (Scenario 1.b: Wet/Dry Season, 300 mg/m3 Threshold) in relation to community facilities and sensitive receptors.



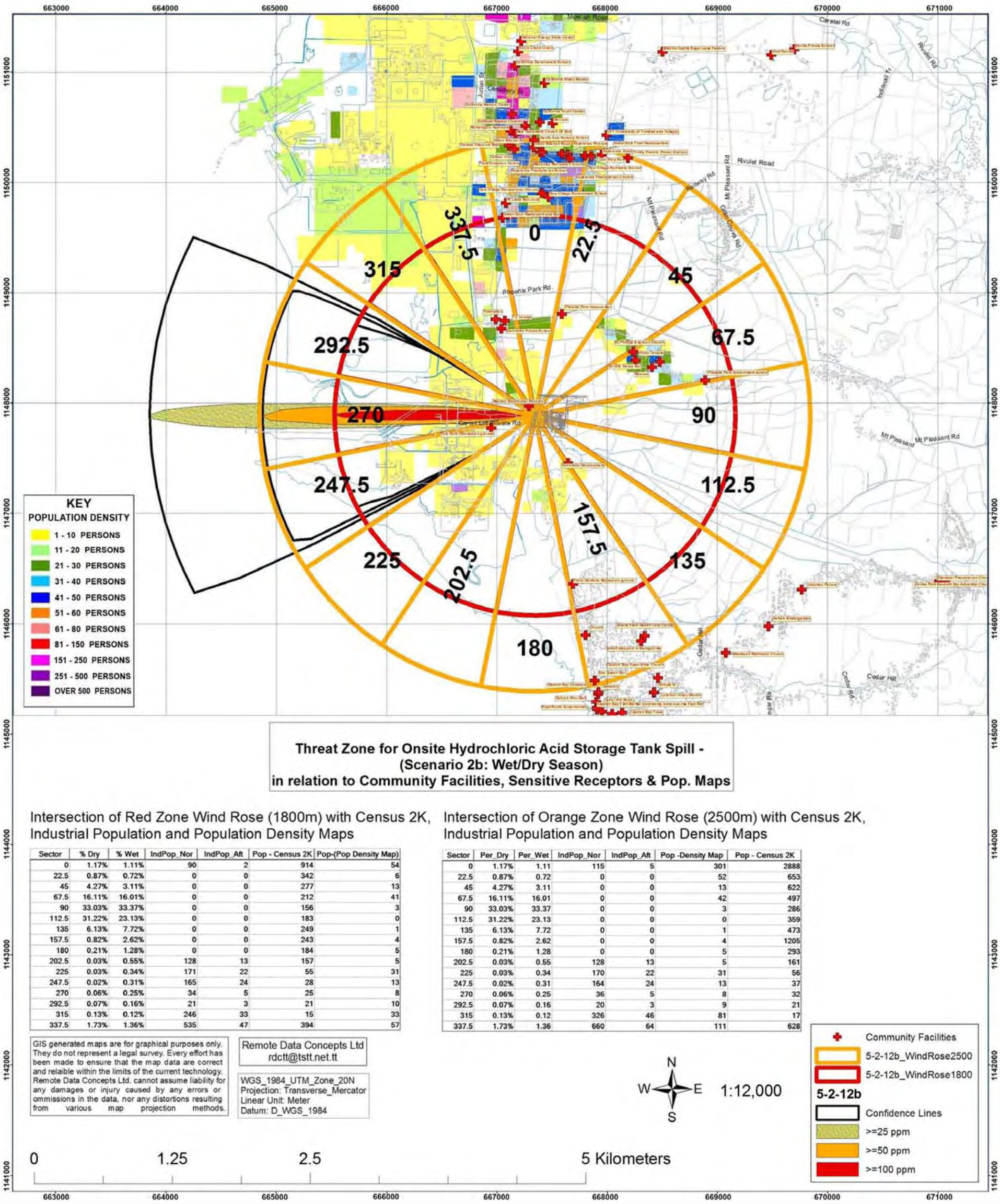
Intersection of Red Zone Wind Rose (1800m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	914	54
22.5	0.87%	0.72%	0	0	342	6
45	4.27%	3.11%	0	0	277	13
67.5	16.11%	16.01%	0	0	212	41
90	33.03%	33.37%	0	0	156	3
112.5	31.22%	23.13%	0	0	183	0
135	6.13%	7.72%	0	0	249	1
157.5	0.82%	2.62%	0	0	243	4
180	0.21%	1.28%	0	0	184	5
202.5	0.03%	0.55%	128	13	157	5
225	0.03%	0.34%	171	22	55	31
247.5	0.02%	0.31%	165	24	28	13
270	0.06%	0.25%	34	5	25	8
292.5	0.07%	0.16%	21	3	21	10
315	0.13%	0.12%	246	33	15	33
337.5	1.73%	1.36%	535	47	394	57

Intersection of Orange Zone Wind Rose (2500m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	115	5	301	2888
22.5	0.87%	0.72	0	0	52	653
45	4.27%	3.11	0	0	13	622
67.5	16.11%	16.01	0	0	42	497
90	33.03%	33.37	0	0	3	286
112.5	31.22%	23.13	0	0	0	359
135	6.13%	7.72	0	0	1	473
157.5	0.82%	2.62	0	0	4	1205
180	0.21%	1.28	0	0	5	293
202.5	0.03%	0.55	128	13	5	161
225	0.03%	0.34	170	22	31	56
247.5	0.02%	0.31	164	24	13	37
270	0.06%	0.25	36	5	8	32
292.5	0.07%	0.16	20	3	9	21
315	0.13%	0.12	326	46	81	17
337.5	1.73%	1.36	660	64	111	628

Figure 5.2-12a. Threat zone for onsite hydrochloric acid storage tank spill (Scenario 2.b: Wet/Dry Season) in relation to time-weighted population.



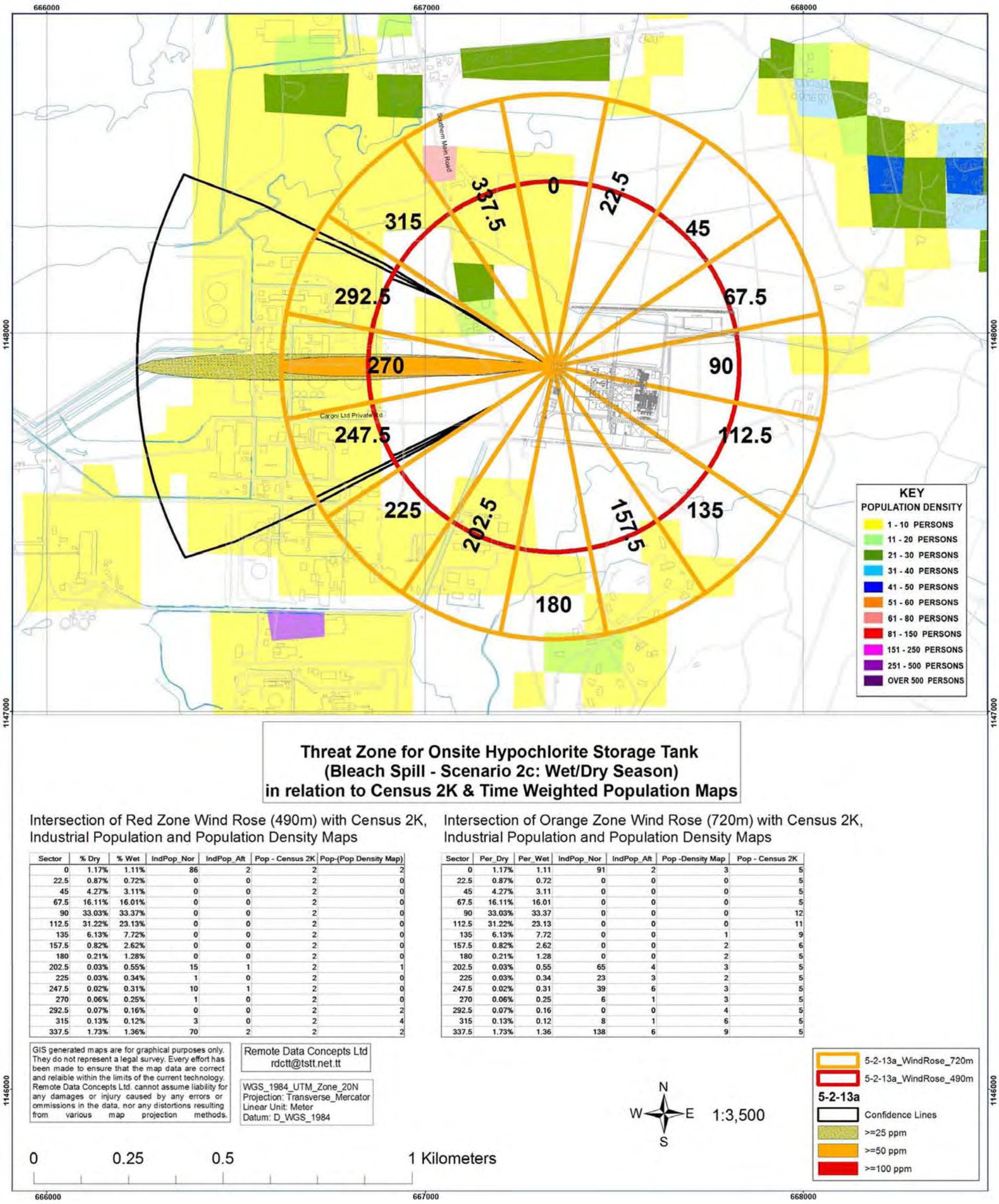
Intersection of Red Zone Wind Rose (1800m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	90	2	914	54
22.5	0.87%	0.72%	0	0	342	6
45	4.27%	3.11%	0	0	277	13
67.5	16.11%	16.01%	0	0	212	41
90	33.03%	33.37%	0	0	156	3
112.5	31.22%	23.13%	0	0	183	0
135	6.13%	7.72%	0	0	249	1
157.5	0.82%	2.62%	0	0	243	4
180	0.21%	1.28%	0	0	184	5
202.5	0.03%	0.55%	128	13	157	5
225	0.03%	0.34%	171	22	55	31
247.5	0.02%	0.31%	165	24	28	13
270	0.06%	0.25%	34	5	25	8
292.5	0.07%	0.16%	21	3	21	10
315	0.13%	0.12%	246	33	15	33
337.5	1.73%	1.36%	535	47	394	57

Intersection of Orange Zone Wind Rose (2500m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	115	5	301	2888
22.5	0.87%	0.72	0	0	52	653
45	4.27%	3.11	0	0	13	622
67.5	16.11%	16.01	0	0	42	497
90	33.03%	33.37	0	0	3	286
112.5	31.22%	23.13	0	0	0	359
135	6.13%	7.72	0	0	1	473
157.5	0.82%	2.62	0	0	4	1205
180	0.21%	1.28	0	0	5	293
202.5	0.03%	0.55	128	13	5	161
225	0.03%	0.34	170	22	31	56
247.5	0.02%	0.31	164	24	13	37
270	0.06%	0.25	36	5	8	32
292.5	0.07%	0.16	20	3	9	21
315	0.13%	0.12	326	46	81	17
337.5	1.73%	1.36	660	64	111	628

Figure 5.2-12b. Threat zone for onsite hydrochloric acid storage tank spill (Scenario 2.b: Wet/Dry Season) in relation to community facilities and sensitive receptors.



Threat Zone for Onsite Hypochlorite Storage Tank (Bleach Spill - Scenario 2c: Wet/Dry Season) in relation to Census 2K & Time Weighted Population Maps

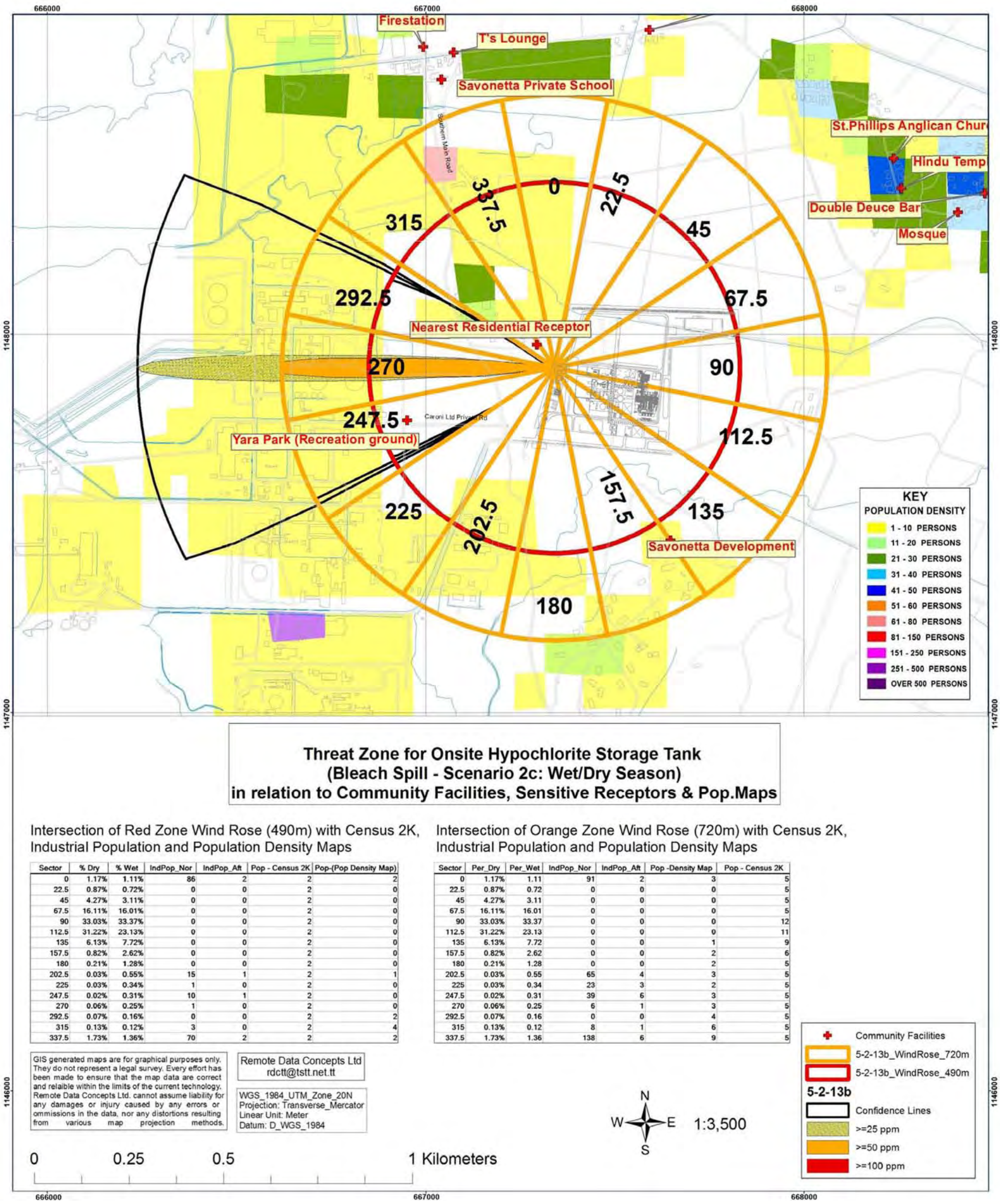
Intersection of Red Zone Wind Rose (490m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	86	2	2	2
22.5	0.87%	0.72%	0	0	2	0
45	4.27%	3.11%	0	0	2	0
67.5	16.11%	16.01%	0	0	2	0
90	33.03%	33.37%	0	0	2	0
112.5	31.22%	23.13%	0	0	2	0
135	6.13%	7.72%	0	0	2	0
157.5	0.82%	2.62%	0	0	2	0
180	0.21%	1.28%	0	0	2	0
202.5	0.03%	0.55%	15	1	2	1
225	0.03%	0.34%	1	0	2	0
247.5	0.02%	0.31%	10	1	2	0
270	0.06%	0.25%	1	0	2	0
292.5	0.07%	0.16%	0	0	2	2
315	0.13%	0.12%	3	0	2	4
337.5	1.73%	1.36%	70	2	2	2

Intersection of Orange Zone Wind Rose (720m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	91	2	3	5
22.5	0.87%	0.72	0	0	0	5
45	4.27%	3.11	0	0	0	5
67.5	16.11%	16.01	0	0	0	5
90	33.03%	33.37	0	0	0	12
112.5	31.22%	23.13	0	0	0	11
135	6.13%	7.72	0	0	1	9
157.5	0.82%	2.62	0	0	2	6
180	0.21%	1.28	0	0	2	5
202.5	0.03%	0.55	65	4	3	5
225	0.03%	0.34	23	3	2	5
247.5	0.02%	0.31	39	6	3	5
270	0.06%	0.25	6	1	3	5
292.5	0.07%	0.16	0	0	4	5
315	0.13%	0.12	8	1	6	5
337.5	1.73%	1.36	138	6	9	5

Figure 5.2-13a. Threat zone for onsite hypochlorite storage tank (bleach spill) (Scenario 2.c: Wet/Dry Season) in relation to time-weighted population.



Threat Zone for Onsite Hypochlorite Storage Tank
(Bleach Spill - Scenario 2c: Wet/Dry Season)
in relation to Community Facilities, Sensitive Receptors & Pop.Maps

Intersection of Red Zone Wind Rose (490m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	86	2	2	2
22.5	0.87%	0.72%	0	0	2	0
45	4.27%	3.11%	0	0	2	0
67.5	16.11%	16.01%	0	0	2	0
90	33.03%	33.37%	0	0	2	0
112.5	31.22%	23.13%	0	0	2	0
135	6.13%	7.72%	0	0	2	0
157.5	0.82%	2.62%	0	0	2	0
180	0.21%	1.28%	0	0	2	0
202.5	0.03%	0.55%	15	1	2	1
225	0.03%	0.34%	1	0	2	0
247.5	0.02%	0.31%	10	1	2	0
270	0.06%	0.25%	1	0	2	0
292.5	0.07%	0.16%	0	0	2	2
315	0.13%	0.12%	3	0	2	4
337.5	1.73%	1.36%	70	2	2	2

Intersection of Orange Zone Wind Rose (720m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	91	2	3	5
22.5	0.87%	0.72	0	0	0	5
45	4.27%	3.11	0	0	0	5
67.5	16.11%	16.01	0	0	0	5
90	33.03%	33.37	0	0	0	12
112.5	31.22%	23.13	0	0	0	11
135	6.13%	7.72	0	0	1	9
157.5	0.82%	2.62	0	0	2	6
180	0.21%	1.28	0	0	2	5
202.5	0.03%	0.55	65	4	3	5
225	0.03%	0.34	23	3	2	5
247.5	0.02%	0.31	39	6	3	5
270	0.06%	0.25	6	1	3	5
292.5	0.07%	0.16	0	0	4	5
315	0.13%	0.12	8	1	6	5
337.5	1.73%	1.36	138	6	9	5

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rdctt@tstt.net.tt

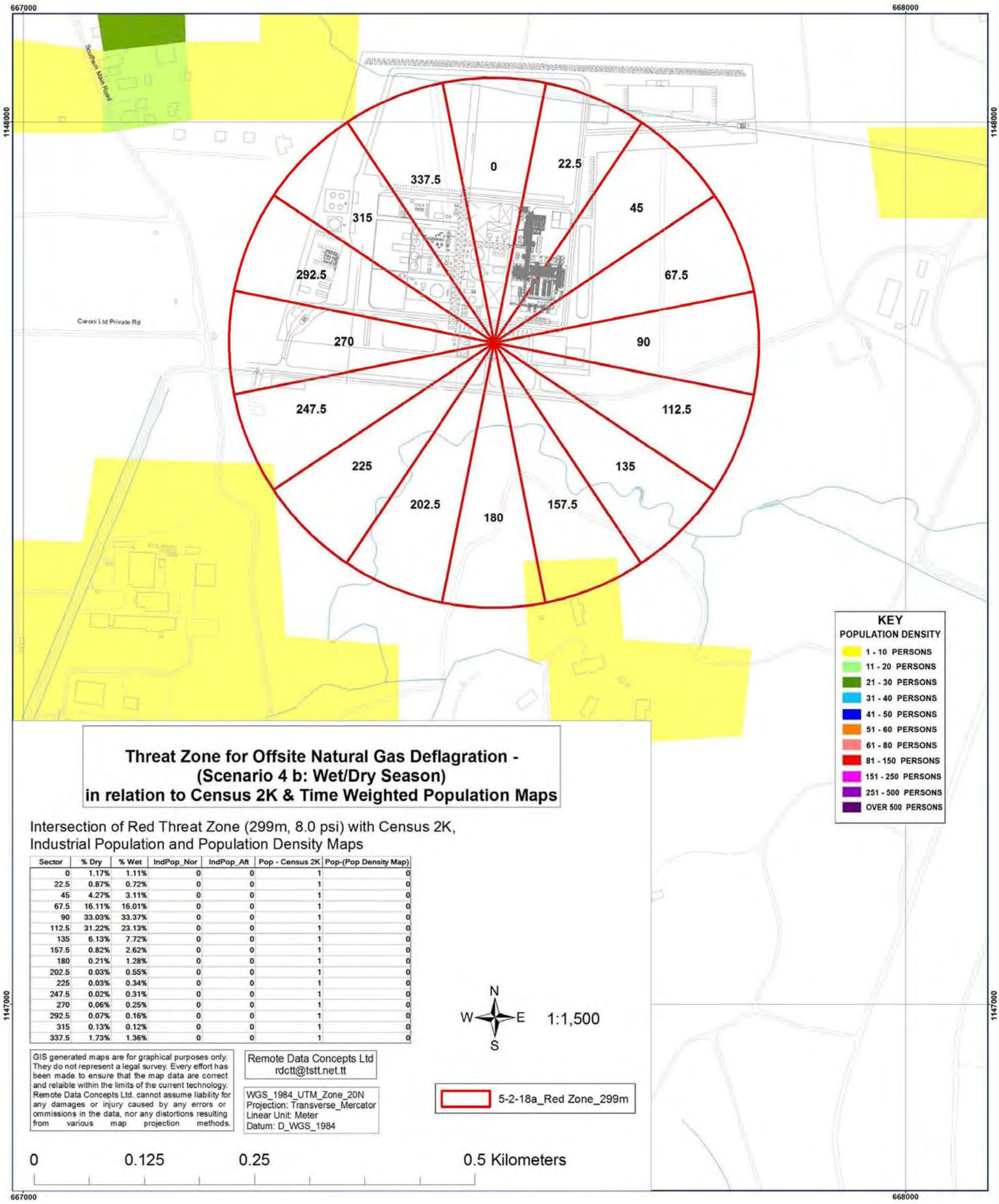
WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

N W E S 1:3,500

0 0.25 0.5 1 Kilometers

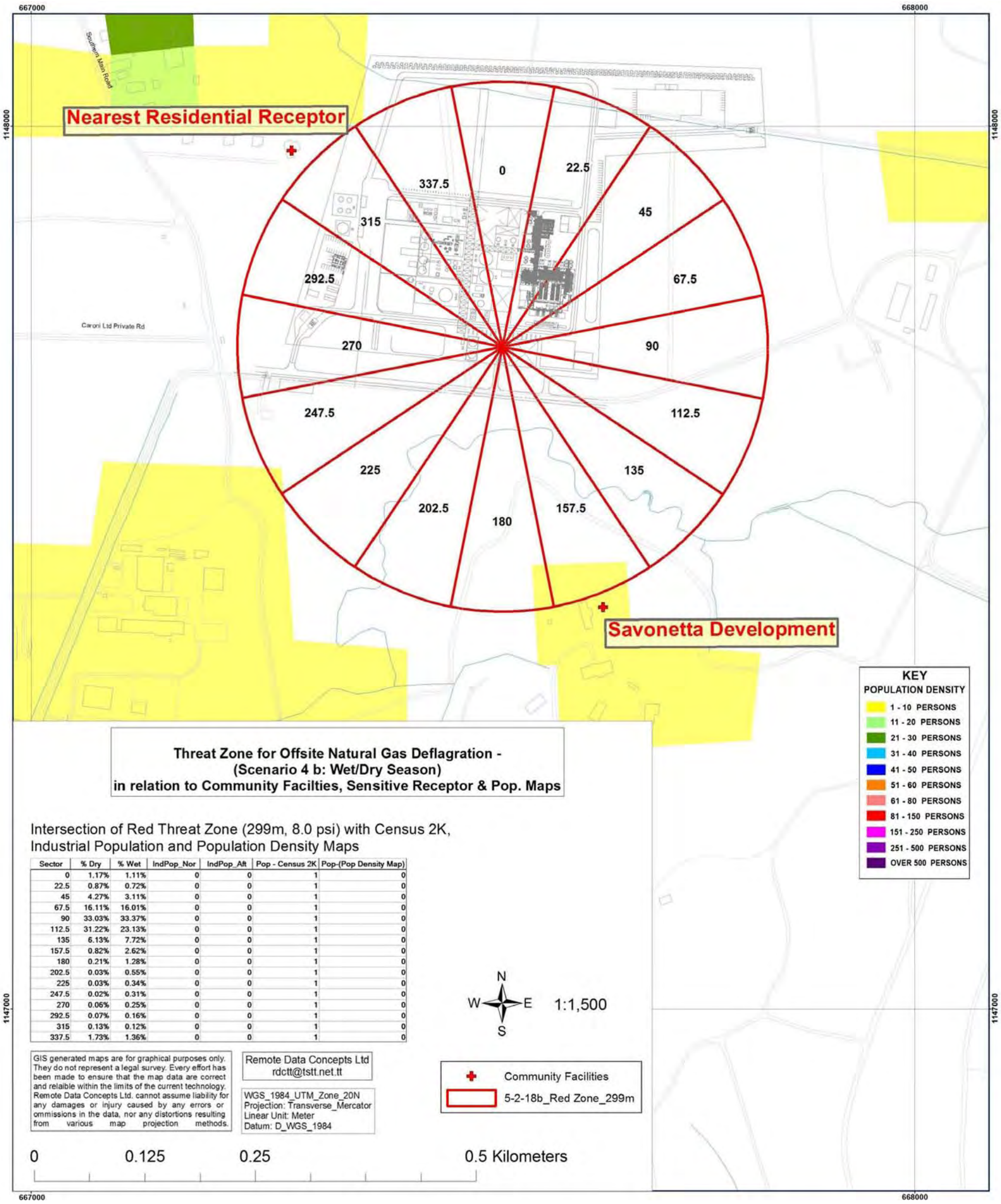
Community Facilities
5-2-13b_WindRose_720m
5-2-13b_WindRose_490m
5-2-13b
Confidence Lines
>=25 ppm
>=50 ppm
>=100 ppm

Figure 5.2-13b. Threat zone for onsite hypochlorite storage tank (bleach spill) (Scenario 2.c: Wet/Dry Season) in relation to community facilities and sensitive receptors.



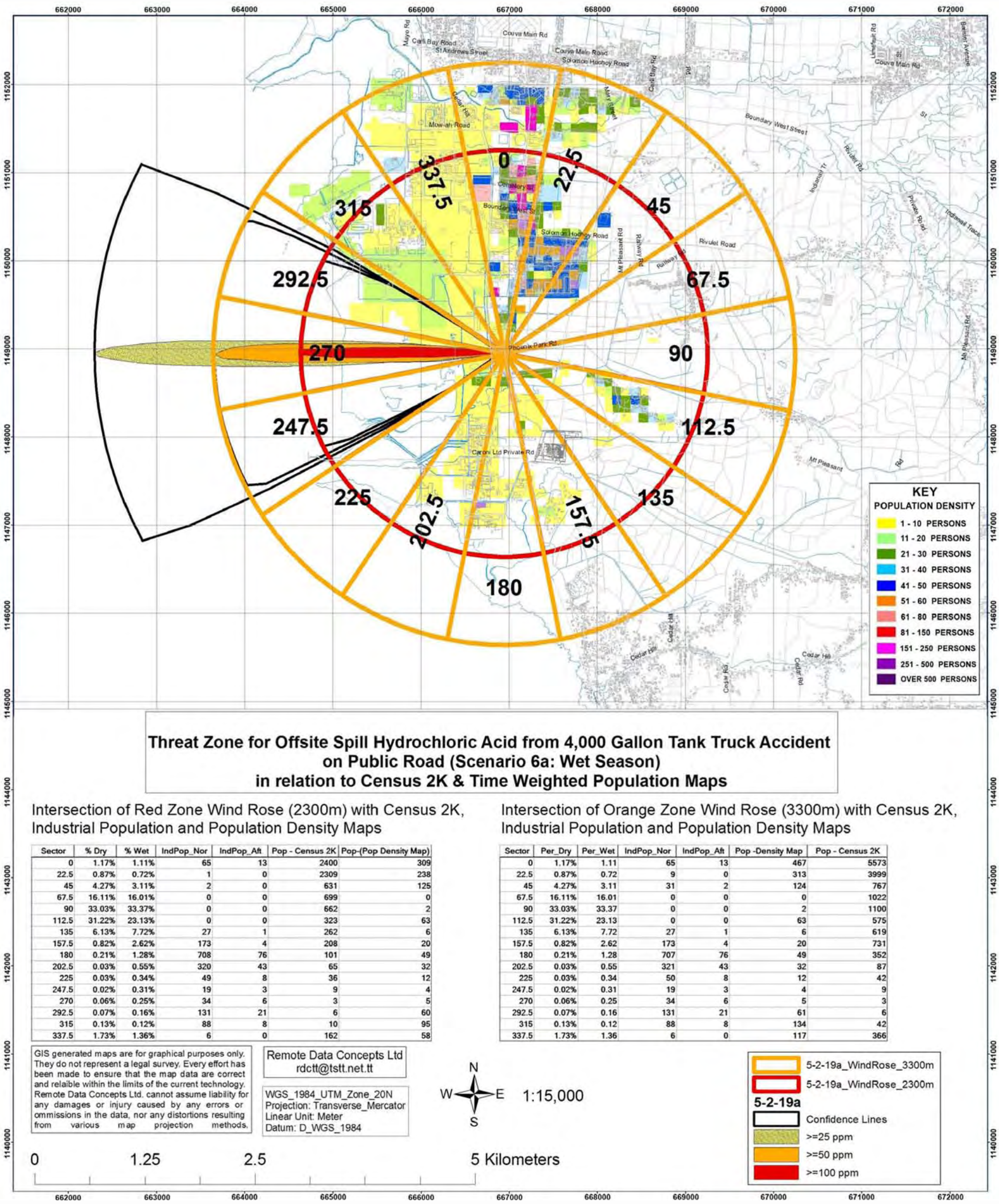
Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0	0	1	0
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	0
315	0.13%	0.12%	0	0	1	0
337.5	1.73%	1.36%	0	0	1	0

Figure 5.2-14a. Threat zone for offsite natural gas deflagration (Scenario 4.b: Wet/Dry Season) in relation to time-weighted



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0	0	1	0
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	0
315	0.13%	0.12%	0	0	1	0
337.5	1.73%	1.36%	0	0	1	0

Figure 5.2-14b. Threat zone for offsite natural gas deflagration (Scenario 4.b: Wet/Dry Season) in relation to community facilities and sensitive receptors.



Threat Zone for Offsite Spill Hydrochloric Acid from 4,000 Gallon Tank Truck Accident on Public Road (Scenario 6a: Wet Season) in relation to Census 2K & Time Weighted Population Maps

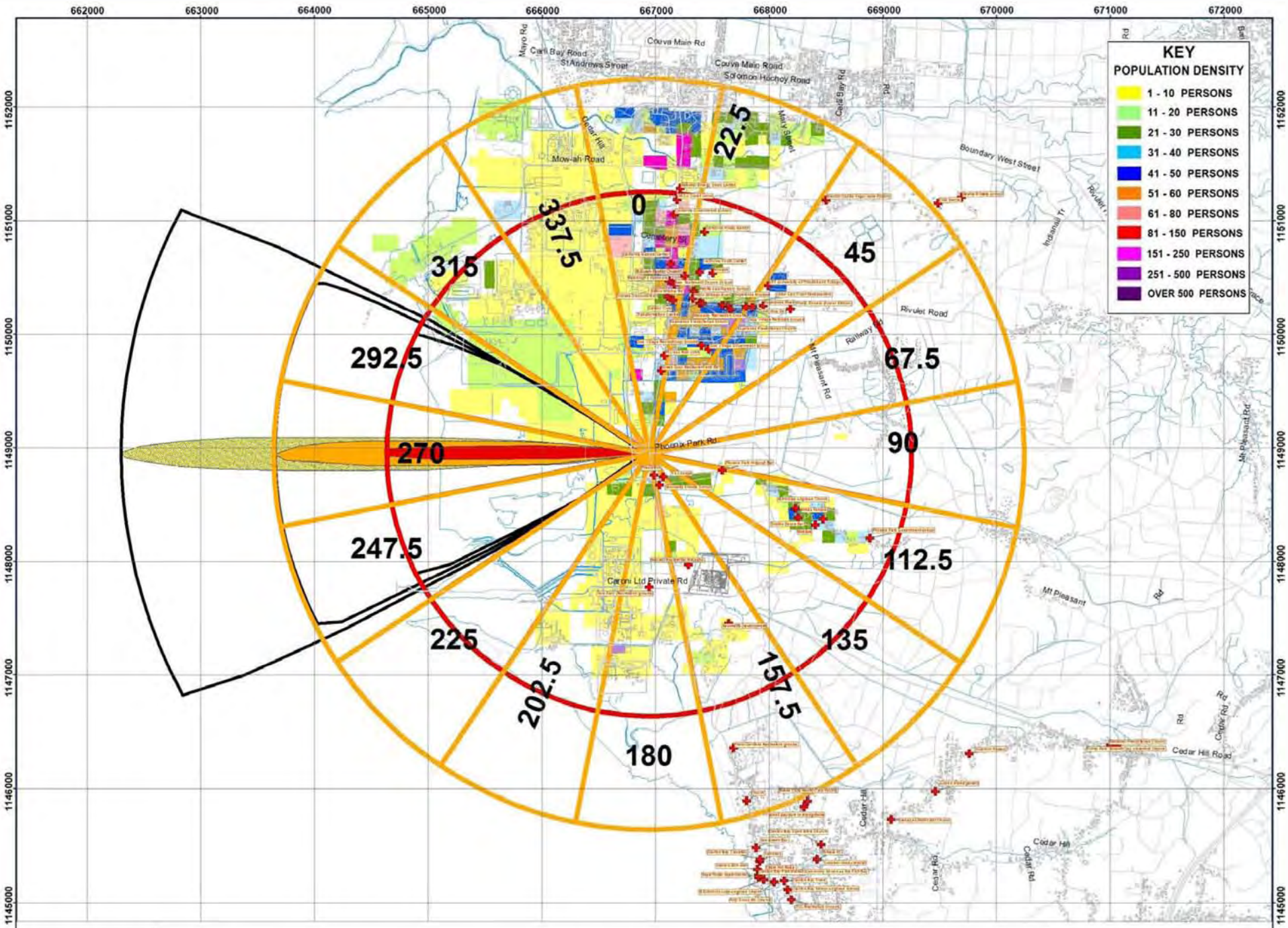
Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	699	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	65	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3300m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

Figure 5.2-15a. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Wet Season) in relation to time-weighted population.



Threat Zone for Offsite Spill Hydrochloric Acid from 4,000 Gallon Tank Truck Accident on Public Road (Scenario 6a: Wet Season) in relation to Community Facilities, Sensitive Receptor & Pop. Maps

Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	699	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	65	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3300m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

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WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

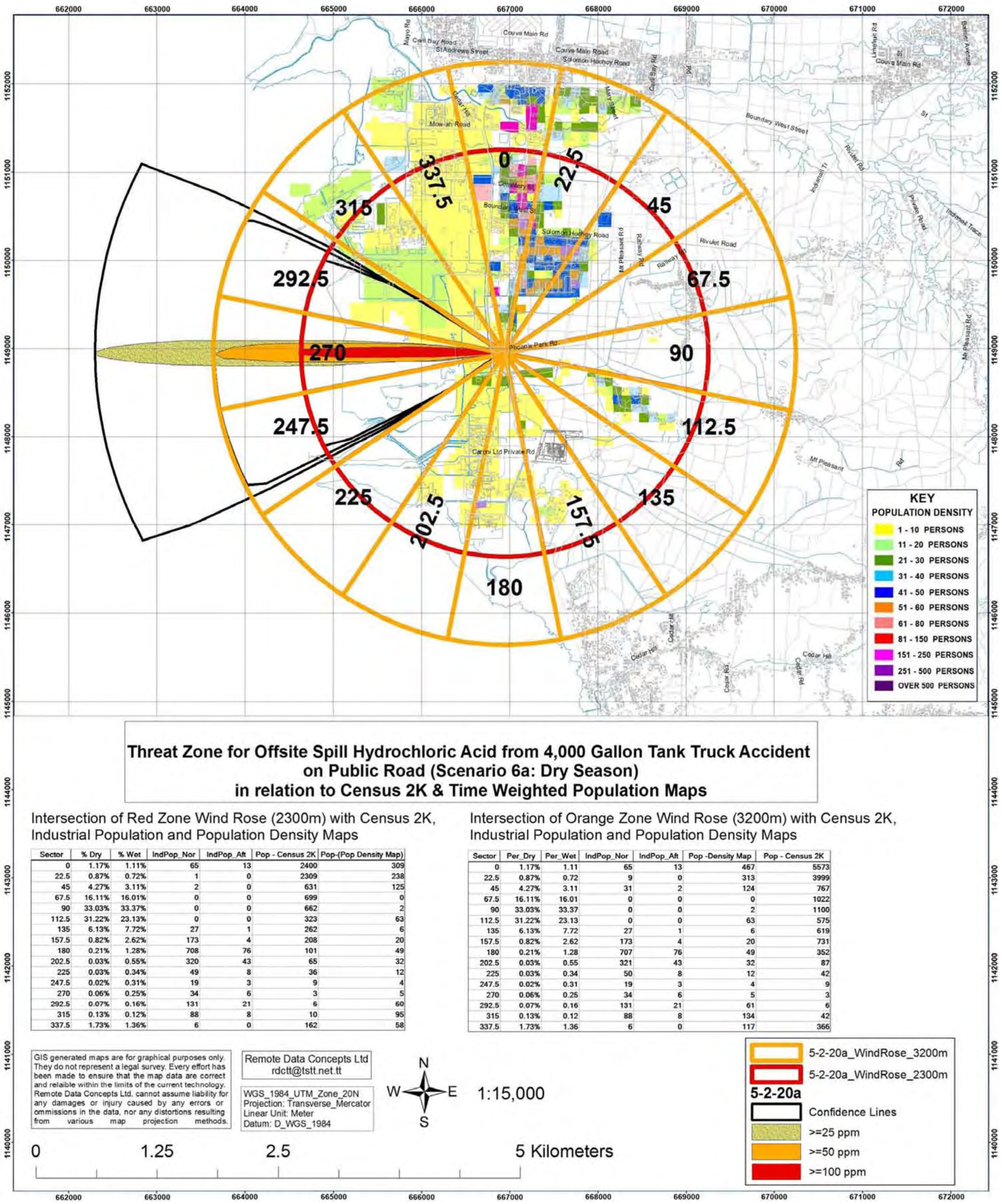
N W E S

1:15,000

0 1.25 2.5 5 Kilometers

5-2-19b_WindRose_3300m
5-2-19b_WindRose_2300m
5-2-19b
Confidence Lines
>=25 ppm
>=50 ppm
>=100 ppm

Figure 5.2-15b. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Wet Season) in relation to community facilities and sensitive receptors.



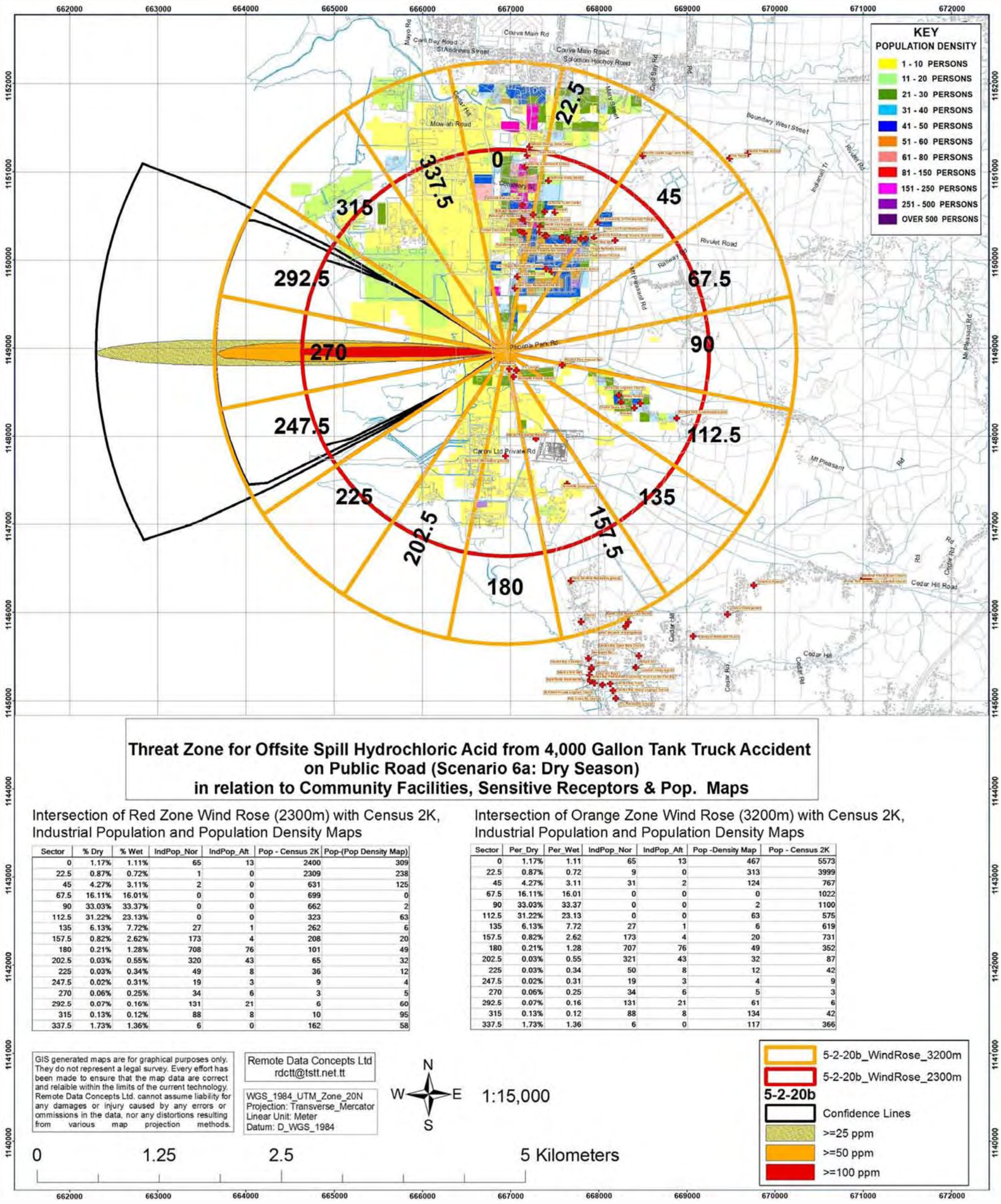
Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	699	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	65	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3200m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

Figure 5.2-16a. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Dry Season) in relation to time-weighted population.



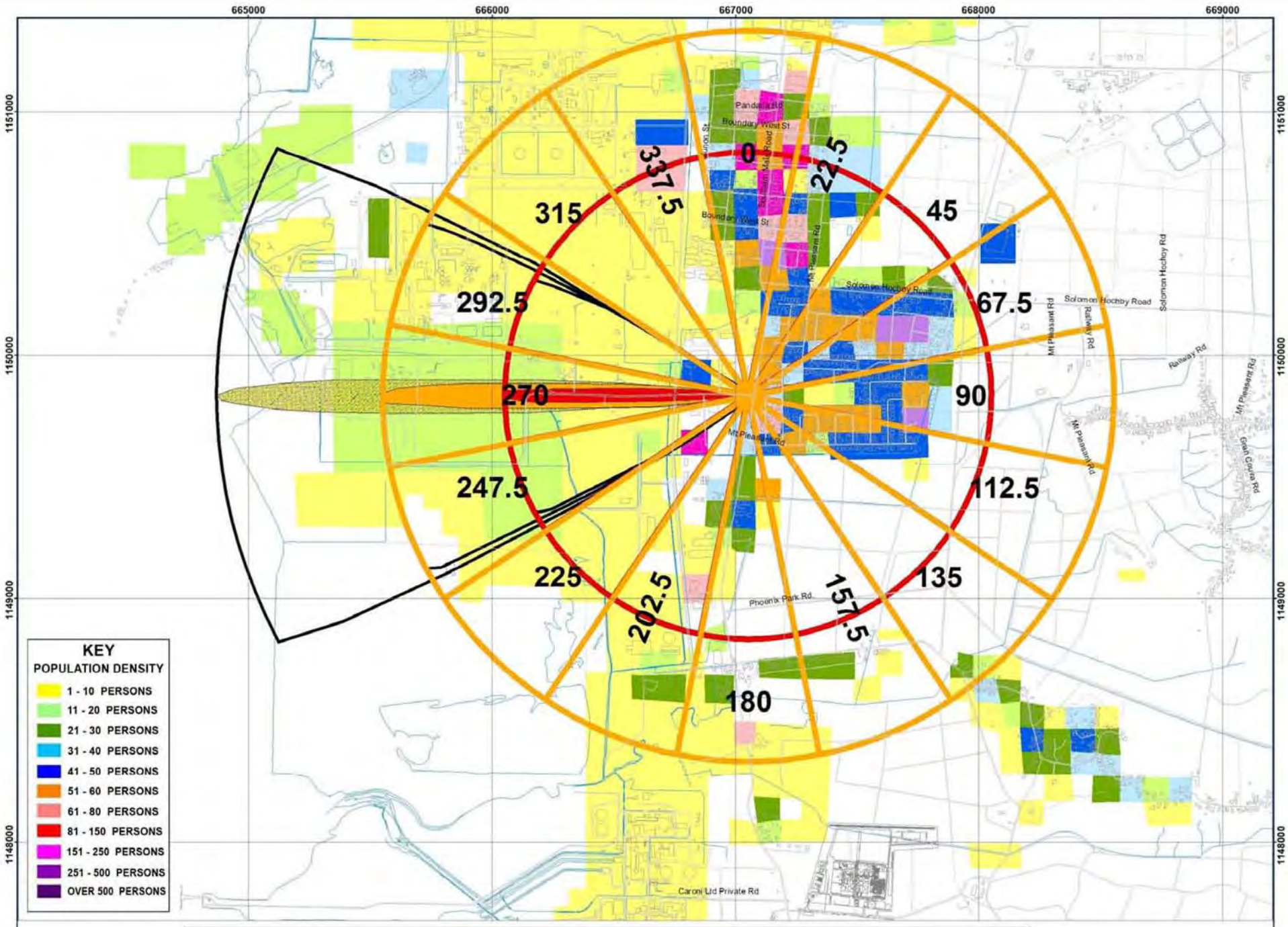
Intersection of Red Zone Wind Rose (2300m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	65	13	2400	309
22.5	0.87%	0.72%	1	0	2309	238
45	4.27%	3.11%	2	0	631	125
67.5	16.11%	16.01%	0	0	699	0
90	33.03%	33.37%	0	0	662	2
112.5	31.22%	23.13%	0	0	323	63
135	6.13%	7.72%	27	1	262	6
157.5	0.82%	2.62%	173	4	208	20
180	0.21%	1.28%	708	76	101	49
202.5	0.03%	0.55%	320	43	65	32
225	0.03%	0.34%	49	8	36	12
247.5	0.02%	0.31%	19	3	9	4
270	0.06%	0.25%	34	6	3	5
292.5	0.07%	0.16%	131	21	6	60
315	0.13%	0.12%	88	8	10	95
337.5	1.73%	1.36%	6	0	162	58

Intersection of Orange Zone Wind Rose (3200m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	65	13	467	5573
22.5	0.87%	0.72	9	0	313	3999
45	4.27%	3.11	31	2	124	767
67.5	16.11%	16.01	0	0	0	1022
90	33.03%	33.37	0	0	2	1100
112.5	31.22%	23.13	0	0	63	575
135	6.13%	7.72	27	1	6	619
157.5	0.82%	2.62	173	4	20	731
180	0.21%	1.28	707	76	49	352
202.5	0.03%	0.55	321	43	32	87
225	0.03%	0.34	50	8	12	42
247.5	0.02%	0.31	19	3	4	9
270	0.06%	0.25	34	6	5	3
292.5	0.07%	0.16	131	21	61	6
315	0.13%	0.12	88	8	134	42
337.5	1.73%	1.36	6	0	117	366

Figure 5.2-16b. Threat zone for offsite spill of hydrochloric acid from 4,000-gallon tank truck accident on public road (Scenario 6.a: Dry Season) in relation to community facilities and sensitive receptors.



Threat Zone for Offsite Hypochlorite Spill from 4,000 Gallon Tank Truck Accident on Public Road (Scenario 6b: Wet Season) in relation to Census 2K & Time Weighted Population Maps

Intersection of Red Zone Wind Rose (1000m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	4	0	534	96
22.5	0.87%	0.72%	1	0	504	83
45	4.27%	3.11%	0	0	597	47
67.5	16.11%	16.01%	0	0	461	106
90	33.03%	33.37%	0	0	270	66
112.5	31.22%	23.13%	0	0	274	42
135	6.13%	7.72%	0	0	363	12
157.5	0.82%	2.62%	0	0	358	9
180	0.21%	1.28%	0	0	362	20
202.5	0.03%	0.55%	24	4	168	21
225	0.03%	0.34%	22	4	100	20
247.5	0.02%	0.31%	67	7	32	18
270	0.06%	0.25%	41	3	18	19
292.5	0.07%	0.16%	29	6	38	17
315	0.13%	0.12%	21	4	155	10
337.5	1.73%	1.36%	5	1	431	21

Intersection of Orange Zone Wind Rose (1500m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	4	0	172	1096
22.5	0.87%	0.72	1	0	108	774
45	4.27%	3.11	1	0	49	770
67.5	16.11%	16.01	0	0	114	515
90	33.03%	33.37	0	0	66	399
112.5	31.22%	23.13	0	0	42	405
135	6.13%	7.72	0	0	15	506
157.5	0.82%	2.62	9	0	17	422
180	0.21%	1.28	573	53	42	404
202.5	0.03%	0.55	96	16	39	177
225	0.03%	0.34	58	10	24	102
247.5	0.02%	0.31	134	17	37	34
270	0.06%	0.25	42	3	56	20
292.5	0.07%	0.16	29	7	31	39
315	0.13%	0.12	21	4	22	163
337.5	1.73%	1.36	5	1	59	608

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WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

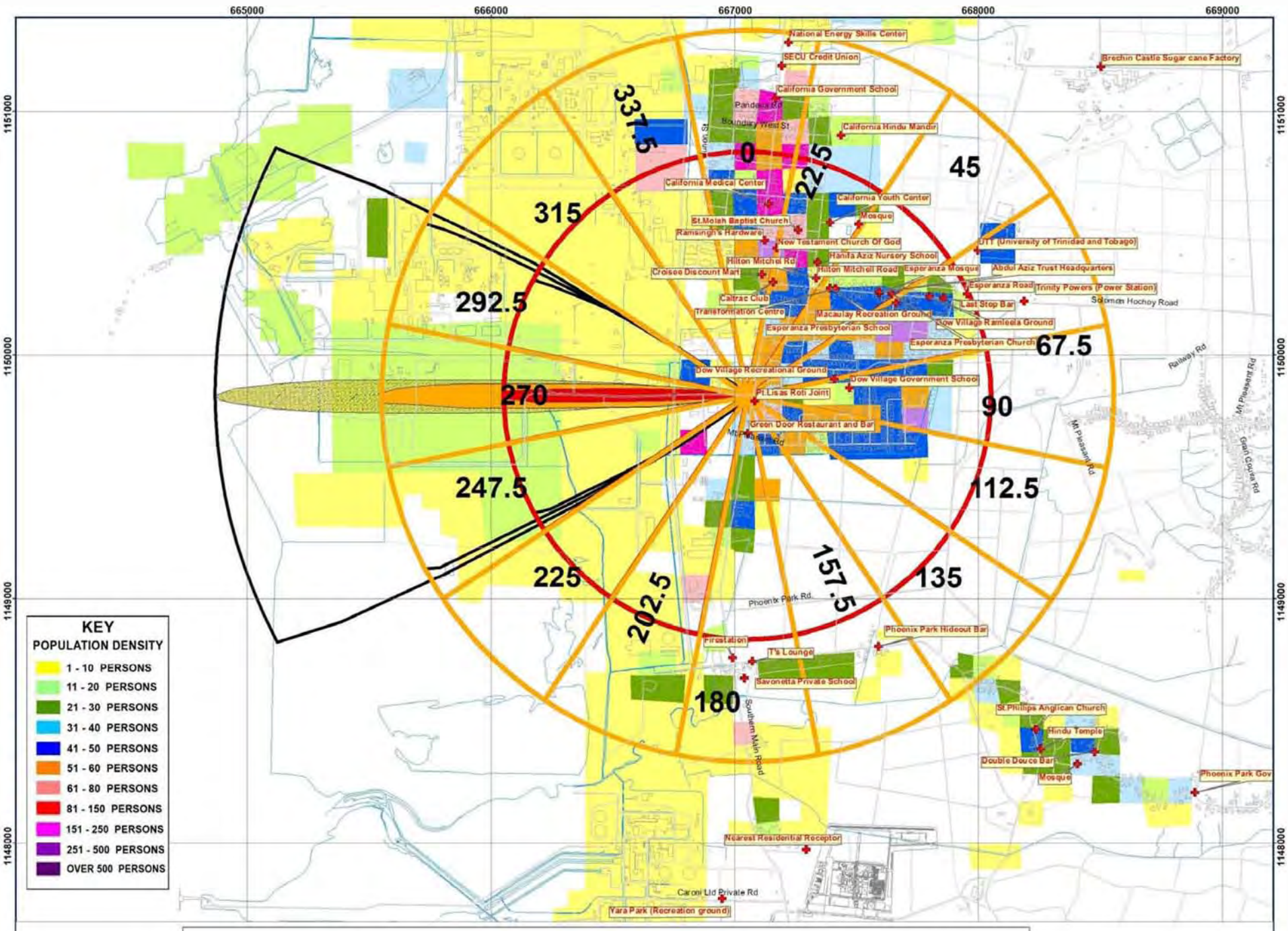
N W E S

1:7,000

0 0.5 1 2 Kilometers

5-2-21a_WindRose_1500m
5-2-21a_WindRose_1000m
5-2-21a
Confidence Lines
>=25 ppm
>=50 ppm
>=100 ppm

Figure 5.2-17a. Threat zone for offsite spill of hypochlorite from 4,000-gallon tank truck accident on public road (Scenario 6.b: Wet Season) in relation to time-weighted population.



Threat Zone for Offsite Hypochlorite Spill from 4,000 Gallon Tank Truck Accident on Public Road (Scenario 6b: Wet Season) in relation to Community Facilities, Sensitive Receptor & Pop. Maps

Intersection of Red Zone Wind Rose (1000m) with Census 2K, Industrial Population and Population Density Maps

Sector	% Dry	% Wet	IndPop_Nor	IndPop_Aft	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	4	0	534	96
22.5	0.87%	0.72%	1	0	504	83
45	4.27%	3.11%	0	0	597	47
67.5	16.11%	16.01%	0	0	461	106
90	33.03%	33.37%	0	0	270	66
112.5	31.22%	23.13%	0	0	274	42
135	6.13%	7.72%	0	0	363	12
157.5	0.82%	2.62%	0	0	358	9
180	0.21%	1.28%	0	0	362	20
202.5	0.03%	0.55%	24	4	168	21
225	0.03%	0.34%	22	4	100	20
247.5	0.02%	0.31%	67	7	32	18
270	0.06%	0.25%	41	3	18	19
292.5	0.07%	0.16%	29	6	38	17
315	0.13%	0.12%	21	4	155	10
337.5	1.73%	1.36%	5	1	431	21

Intersection of Orange Zone Wind Rose (1500m) with Census 2K, Industrial Population and Population Density Maps

Sector	Per_Dry	Per_Wet	IndPop_Nor	IndPop_Aft	Pop -Density Map	Pop - Census 2K
0	1.17%	1.11	4	0	172	1096
22.5	0.87%	0.72	1	0	108	774
45	4.27%	3.11	1	0	49	770
67.5	16.11%	16.01	0	0	114	515
90	33.03%	33.37	0	0	66	399
112.5	31.22%	23.13	0	0	42	405
135	6.13%	7.72	0	0	15	506
157.5	0.82%	2.62	9	0	17	422
180	0.21%	1.28	573	53	42	404
202.5	0.03%	0.55	96	16	39	177
225	0.03%	0.34	58	10	24	102
247.5	0.02%	0.31	134	17	37	34
270	0.06%	0.25	42	3	56	20
292.5	0.07%	0.16	29	7	31	39
315	0.13%	0.12	21	4	22	163
337.5	1.73%	1.36	5	1	59	608

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WGS_1984_UTM_Zone_20N
Projection: Transverse_Mercator
Linear Unit: Meter
Datum: D_WGS_1984

N W E S

1:7,000

0 0.5 1 2 Kilometers

5-2-21b_WindRose_1500m
5-2-21b_WindRose_1000m
5-2-21b
Confidence Lines
>=25 ppm
>=50 ppm
>=100 ppm

Figure 5.2-17b. Threat Zone for offsite spill of hypochlorite from 4,000-gallon tank truck accident on public road (Scenario 6.b: Wet Season) in relation to community facilities and sensitive receptors.

ATTACHMENT 4

ADDENDUM TO THE QUANTITATIVE RISK ASSESSMENT

Addendum to the Quantitative Risk Assessment

CEC1743/2006

January 16, 2009

Prepared by:

Da Costa Gwendoline, Limited

ICF International

1. INTRODUCTION

In June 2008, CariSal submitted a Quantitative Risk Assessment (QRA) as an appendix to the EIA report to the Trinidad and Tobago Environmental Management Authority (EMA). ICF International prepared this Addendum to the QRA (Addendum) to address the EMA's comments on the QRA. This Introduction summarizes the scope of the revisions made in response to EMA comments. Section 2 describes the CariSal Project. Section 3 describes the methodology for the Addendum analysis, including the accident scenarios analyzed, the models employed, and the meteorological data used as model inputs. Section 4 presents and discusses the results of the release and dispersion modelling for the accident scenarios that were considered in the QRA. Section 5 describes the results of the societal risk assessment, and Section 6 describes the results of the risk assessment for individuals in the population residing in the Project vicinity. Appendix A to this Addendum summarizes the dispersion modelling inputs and results for the release scenarios described in Section 4. Appendix B presents a discussion of the inhalation toxicology of hydrogen chloride. Modelling results are presented for the ALOHA dispersion model in Appendix C and for the SLAB dispersion model in Appendix D.

1.1 Accident Scenarios

Accident scenarios for the proposed chlor-alkali plant were identified by reviewing the revised hazard identification (HAZID) and process flow diagrams and considering the proposed process design and operation. Accident scenarios associated with ex-situ facilities and offsite transportation operations also were identified and selected for further evaluation in this Addendum. Revised analyses are presented for four categories of accident scenarios:

1. Onsite chlorine gas releases (process pipe breach scenarios)
2. Onsite hydrochloric acid releases (storage tank releases)
3. Onsite hypochlorite releases (storage tank releases)
4. Offsite transportation accidents (tank truck releases)
   - Offsite hydrochloric acid spill
   - Offsite sodium hypochlorite spill

In addition, modelling results for the offsite natural gas release/deflagration scenario that was analyzed in the original QRA are also presented in this Addendum. No revisions were made to the modelling parameters for this scenario. This scenario is included in the estimation of total individual risk.

1.2 Scope of Revisions

This Addendum to the QRA was prepared in response to the EMA's RAR issued to CariSal on November 7, 2008. The EMA asked that scenarios included in the QRA be reanalysed and submitted to them in January 2008.

The results of the societal risk assessment in this addendum differ from that in the original EIA. The societal risk assessment in this Addendum indicates that all of the accident scenarios are below the lower curve of the Netherlands F-N Curve and within societal risk guidelines. There are three principal reasons why the results of the societal risk assessment in this addendum differ from that of the original EIA, as described below:

The exposure threshold concentrations used in the modelling of release scenarios in the original EIA were the "Immediately Dangerous to Life or Health (IDLH)" values for chlorine and hydrochloric acid. These exposure threshold values are overly conservative with respect to evaluating the potential for fatalities, as opposed to evaluating the potential for both fatalities and other health effects. Therefore, the revised analyses use exposure threshold values for chlorine and hydrochloric acid that correspond to a probability that 10 percent of the exposed population would experience fatality. These exposure threshold values are lower than the IDLH values and therefore the modelled plume areas are also lower than those based on the IDLH values. Therefore, there are fewer residences and businesses situated within the plume areas, reducing the number of persons exposed to the exposure threshold concentrations.

In the original EIA, the ALOHA® model was used for all model runs. The ALOHA® model is a model developed for emergency response and therefore produces more conservative results than other models. For the revised modelling in this Addendum, the SLAB model was used for scenarios where the SLAB model is appropriate. Use of the SLAB model also results in smaller modelled plume areas than does the ALOHA® model; therefore there are fewer residences and businesses situated within the smaller plume areas.

Finally, in the original EIA the estimated amount of material released for the release scenarios and the estimated release durations did not fully reflect the details of the CariSal plant design and mitigation processes or technologies incorporated into the design. For the revised analysis in this Addendum, the release amounts and release durations more closely reflect the CariSal plant design-based mitigation. Therefore, the amount of material released and release duration, which are used as dispersion modelling inputs, are lower for the revised analysis than for the original analysis. This also results in smaller modelled plume areas for the revised modelling and therefore fewer residences and businesses situated within the smaller plume areas.

1.3 Individual Risk Assessment

Comments received from the EMA concerning the individual risk assessment include:

- Total individual risk at a particular location needed to be calculated and presented as the sum of the risks at various locations due to all the hazard outcomes from the facility. This would allow the impact on sensitive receptors to be better determined.
- Vessel failures of the onsite NaOH, HCl, and hypochlorite storage tanks were included in the accidental release scenarios, but tanks leaks (typically more common than a catastrophic tank failure) were not included. The EMA questioned whether these releases could significantly contribute to offsite total individual risk.

In response to these comments, the risk assessment for individuals was revised. Revisions include the following:

- Individual risk levels from the facility as a whole at off-property sensitive receptor locations were assessed. The risks are shown as contours.
- Because the catastrophic failures of these tanks do not result in predicted lethalities, neither will the smaller, more probable releases, and they will not contribute significantly to off-site total individual risk.

The combination of more sophisticated modelling, modelling to those toxic concentrations capable of yielding lethalities in a small portion of the population, and more precise release scenario information significantly reduced the consequences of many of the release scenarios. This in turn reduced both the individual and societal risks.

1.4 Individual Risk Summary

Section 6 includes an assessment of individual risk levels from the facility as a whole at off-property sensitive receptor locations. The risks are shown as contours in Figure 6-1. Typically, contours are prepared for risks in the range of 10^{-4} per year, 10^{-5} per year, 10^{-6} per year, and 10^{-7} per year. Only the 10^{-7} per year contour extends offsite when the new consequence modelling results are used. This result is dominated by the natural gas deflagration (Scenario 4B). All of the contours are very close to the CariSal site. The risks along the transportation route are also well below 10^{-7} per year.

1.5 Societal Risk Assessment

Comments received from the EMA concerning the societal risk assessment include:

- The results of ALOHA® modelling for accident scenarios predicted off-property concentrations well above the criteria listed in Table 3 of the protocol document;
- An appropriate reference was not provided for the F-N Curve used in the societal risk assessment in the QRA;
- Releases of vapour from sodium hypochlorite liquid spills were modelled as chlorine monoxide releases, however, threshold criteria for hydrochloric acid were used to model these releases; clarification was requested as to whether the hypochlorous acid emissions were considered as equivalent chlorine monoxide emissions or if they were modelled separately for these scenarios.
- It has been recommended (Netherlands TNO) that a residential occupancy of 70% is appropriate during daytime, but 100% should be used at night. However, the screening assessment conducted for the QRA appeared to use 70% for both day and night populations.

In response to these comments, the scenario modelling for the societal risk assessment was revised. Revisions to the societal risk assessment include the following:

- The SLAB model was used as an alternative to the ALOHA® model for scenarios where the SLAB model is appropriate for modelling the given release, as approved by the EMA in January 2009 (e.g., SLAB cannot be used to model fires and explosions or indoor release scenarios; the ALOHA® model was applied to these scenarios).
- The EMA provided CariSal with an updated societal risk guideline from The Netherlands. The societal risk was re-assessed using this guideline. Results of the re-assessment and the use of the Dutch societal risk guideline, including the F-N anchor point and line slope the EMA provided are presented in Section 5 of this Addendum.
- Modelling of sodium hypochlorite liquid spill scenarios in the revised analysis was based on evaporation of chlorine gas from the spilled liquid; this assumption is based on an analysis of the chemical properties of sodium hypochlorite solution at conditions anticipated during a spill event. The derivation of the chlorine release rate for liquid hypochlorite spills from the chemical properties of hypochlorite is provided in Section 4 of this Addendum.
- The threshold criterion for the hydrochloric acid release scenarios was revised to 4000 ppm (5,965 mg/m^3) (for a 30-minute average exposure time). At this exposure concentration and average exposure time, the incidence of fatality was estimated to be 10 percent of the exposed population. Threshold criteria for hydrochloric acid are discussed in Section 3.5 of this Addendum.
- The threshold criteria for the chlorine release scenarios were revised to 140 ppm (406 mg/m^3) (for a 10-minute average exposure time) and 80 ppm (172 mg/m^3) (for a 30-minute exposure time). At these exposure concentrations and average exposure times, the incidence of fatality was estimated to be 10 percent of the exposed population. Threshold criteria for hydrochloric acid are discussed in Section 3.5 of this Addendum.
- Residential population calculations for the revised societal risk analysis in this Addendum are based on 100-percent occupancy during the day and 100-percent occupancy at night. Use of 100-percent for all times provides a more conservative assessment for the societal risk analysis. This conservative assumption was thought to be appropriate because the fatality results were fairly low.
- Durations of releases for the scenarios were revised to include the effects of plant design-based mitigation that would reduce the duration of an occurrence and the amount released.

1.6 Societal Risk Assessment Summary

The revised analyses of chlorine gas release scenarios, hydrochloric acid liquid release scenarios, and sodium hypochlorite release scenarios described in this Addendum indicate that all scenarios result in less than one fatality, except for the offsite sodium hypochlorite liquid release (tank truck accident) release scenario (Scenario 6.b.). This scenario, modelled as a chlorine gas release scenario, results in two modelled fatalities. A chlorine gas release from this scenario is unlikely to occur. All scenarios modelled, including Scenario 6.b., are within the societal risk guidelines as indicated by the Netherlands F-N Curve. In addition, the modelling conducted for Scenario 4.b in the original EIA shows one modelled fatality. All of the scenarios are below the lower curve of the Netherlands F-N curve, as shown in Figure 1.6-1.

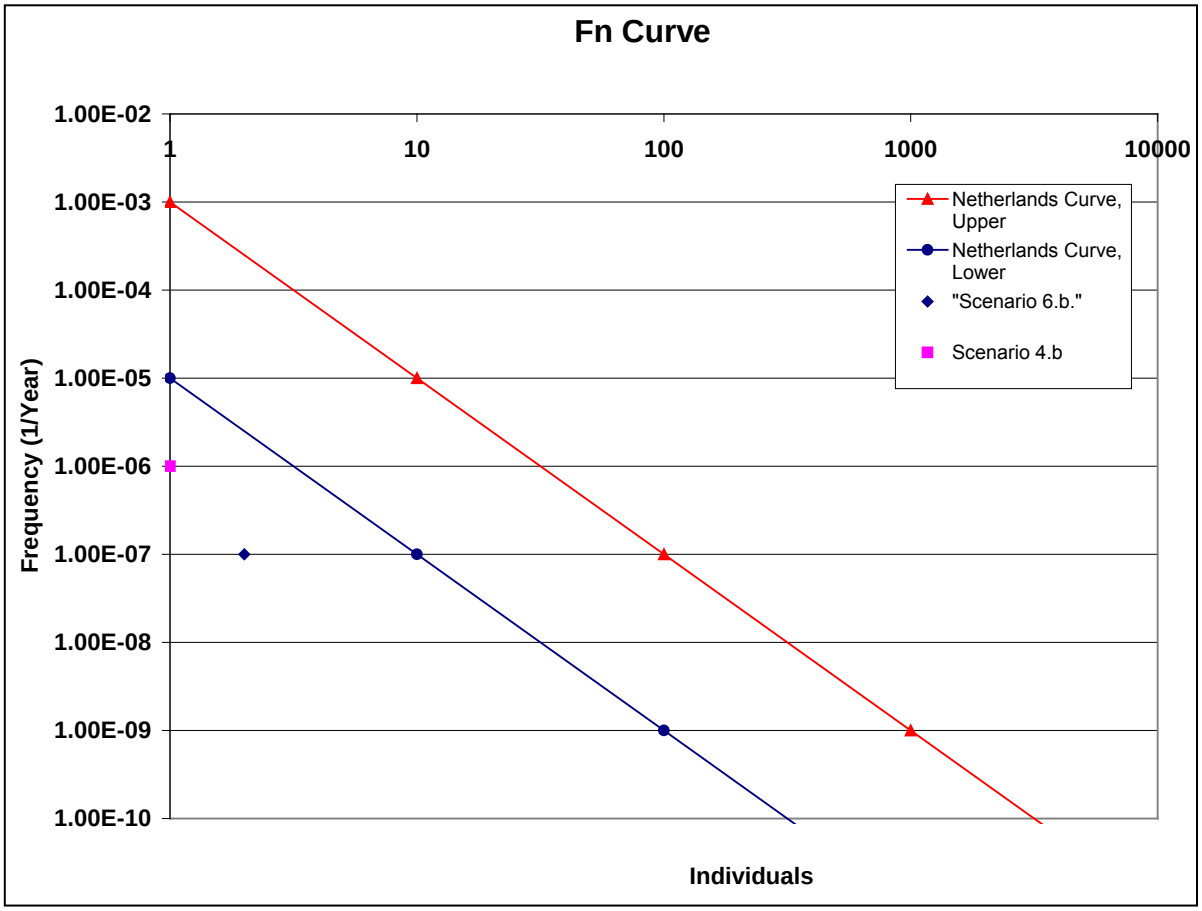


Figure 1.6-1: F-N Curve and Societal Risk Assessment Results.

2. PROPOSED PROJECT

CariSal Unlimited (CariSal) proposes to construct a chlor-alkali plant adjacent to the existing PLIPDECO industrial estate for the production of calcium chloride, caustic soda, sodium hypochlorite, and hydrochloric acid with high quality industrial water as a by-product.

The CariSal Project would use waste brine from DESALCOTT to produce the following products for local and overseas markets:

- Calcium chloride ($CaCl_2$) as 94-percent $CaCl_2$ pellets [65,000 metric tons (MT)/year] and 77-percent $CaCl_2$ flakes (60,000 MT/year);
- Caustic soda (50-percent solution of sodium hydroxide, NaOH) – 93,000 MT/year;
- Hydrochloric acid (36-percent solution of hydrogen chloride, HCl) – 85,000 MT/year; and
- Bleach (12-percent solution of sodium hypochlorite) – 53,000 MT/year

The production process involves production of chlorine in two electrolysis units. Hydrochloric acid (HCl) is an intermediate product of the electrolysis production process. A portion (1,280 MT/year) of the HCl produced by the process would be supplied to market, and the remainder of the HCl produced would be used for calcium chloride production. Hydrochloric acid and sodium hypochlorite solution would be stored on site in storage tanks having secondary containment systems. Sodium hypochlorite solution and hydrochloric acid would be transported off site to customers in 4,000-gallon (15,142-litre) capacity tank trucks and iso-containers. It is estimated that 80 trucks per year would transport hydrochloric acid and 3,200 trucks per year would transport sodium hypochlorite solution. The trucks would be filled from onsite hydrochloric acid and sodium hypochlorite solution storage tanks.

Each electrolysis unit includes approximately 30 metres of indoor 12-inch (30.5-centimetre) diameter chlorine piping and approximately 75 metres of outdoor 12-inch (30.5-centimetre) diameter chlorine piping. No chlorine would be stored on site; all chlorine would be contained in process piping or in equipment. The hydrochloric acid tanks and sodium hypochlorite solution tanks would be connected to the process areas by approximately 150 metres of hydrochloric acid piping and 150 metres of sodium hypochlorite piping.

The plot plan showing the locations of the electrolysis units and chlorine piping and the onsite storage tanks is shown in Figure 3.2-2a in the EIA. A map showing the anticipated truck transportation routes for the hydrochloric acid and sodium hypochlorite tank trucks is shown in Figure 5.1-1 of the EIA.

3. METHODOLOGY

3.1 Accident Scenario Description

3.1.1 Overview

Accident scenarios for the proposed chlor-alkali plant were identified based on reviews of the revised hazard identification (HAZID) and process flow diagrams and on considerations of the proposed process design and operation. Accident scenarios associated with ex-situ facilities and offsite transportation operations also were identified and selected for further evaluation for this Addendum. Revised analyses are presented for four categories of accident scenarios:

1. Onsite chlorine gas release
2. Onsite hydrochloric acid release
3. Onsite hypochlorite release
4. Offsite truck transportation accident

In addition, even though no revisions were made to the modelling parameters, results for the offsite natural gas release/deflagration scenario are presented again in this document for the convenience of the review.

3.1.2 Chlorine Release Scenarios

Releases of chlorine gas might result from accidents, including full breach of a chlorine process pipe either within the cell room (indoors) or outside of the cell room (outdoors) or from a line leak in a process pipe. The indoor and outdoor release scenarios were modelled separately because the release conditions differ. A chlorine release would be detected by plant monitoring equipment and would activate the plant's dry compressed air purge system and emergency plant shutdown procedures. Plant emergency shutdown would occur immediately upon detection of a release or detection of a pressure change in the process piping system, limiting the expected chlorine release duration to approximately 10 seconds. To account for the fact that it might take some time for the detection system to detect the release (due to outdoor wind conditions, for example), the releases are assumed to have a higher duration of 30 seconds. The worst-case volume of chlorine for modelling purposes contained in the breached process equipment is equivalent to a release rate of approximately 96 pounds (44 kilograms) per minute for 30 seconds plus the initial volume of chlorine contained in the process pipe (55 pounds; 25 kilograms) at the time of the release, for a total release of 103 pounds (47 kilograms) of chlorine (CariSal Unlimited 2008).

Scenario 1.a.1 Indoor Chlorine Release Scenario

For the indoor release scenario, 103 pounds (47 kilograms) of chlorine would be released within the cell room over a 10-second period at a pressure of 1.23 bar and would be entrained in the cell

room ventilation (ambient air) system and exhausted to the atmosphere. The estimated exhaust gas flow rate is approximately 100,000 Nm^3/hr.

Scenario 1.a.2. Outdoor Chlorine Release Scenario

For the outdoor release, 103 pounds (47 kilograms) of chlorine would be released to the atmosphere over a 30-second period at a pressure of 1.23 bar. The release is assumed to occur as an elevated release (4-m release height). This assumption accounts for the elevated outdoor process piping at the facility.

Scenario 1.a.3 Outdoor Chlorine Release Scenario (Seismic Event)

For an outdoor release caused by a seismic event, 103 pounds (47 kilograms) of chlorine is assumed to be released to the atmosphere over a 30-second period at a pressure of 1.23 bar from each of the two electrolysis units, for a combined release of 206 pounds (94 kilograms) of chlorine. The release is assumed to occur as an elevated release (4-m release height).

Scenario 1.b. Intermixing of Hypochlorite with HCl (Cl_2 Release)

Chlorine could be released in the event of the inadvertent mixing of hydrochloric acid and hypochlorite product in a 4,000-gallon (15,142-litre) tank truck during product loading for shipment off site. Tank trucks used to transport hypochlorite and hydrochloric acid would normally be dedicated to a single material; a breach of procedure could result in inadvertent mixing of the two materials. The scenario would involve the inadvertent loading of 4,000 gallons (15,142 litres) of hypochlorite product into a 4,000-gallon (15,142-litre) tank truck that already contains a 100-gallon (379-litre) "heel" of hydrochloric acid, or the inadvertent loading of 4,000 gallons (15,142 litres) of hydrochloric acid into a 4,000-gallon (15,142-litre) tank truck that already contains a 100-gallon (379-litre) "heel" of hypochlorite. The hypochlorite product contains approximately 12 percent chlorine, and either scenario would result in a release of 120 pounds (54 kilograms) of chlorine gas from the reaction of hypochlorite with hydrochloric acid over the course of approximately 3 minutes. The chlorine gas release would occur from the tank truck vent at an assumed release height of 4 metres. The tank truck would be located outdoors at the CariSal plant loading area, as the mixing-generated release would occur immediately, not on the road. This scenario is unlikely to occur on account of mitigations in place, including design specification of incompatible nozzles between the hydrochloric acid and hypochlorite tank trucks.

3.1.3 Hydrochloric Acid Release Scenarios

Scenario 2.b Vessel Failure: Onsite Hydrochloric Acid Tank

An accidental release of liquid HCl could occur from vessel failure of the onsite hydrochloric acid storage tank, resulting in a maximum 400,000-gallon (1,514,160-litre) release. For this scenario, it is assumed that a 12-inch (30-centimetre) breach in the tank causes the tank to empty at a rate of approximately 1,215 kilograms per second, resulting in a total release of the tank contents over a 24-minute period. This release would involve the 36-percent HCl product. Any such release would be contained in the secondary containment system for the vessel. For this scenario, it is assumed that a catastrophic failure of the vessel would fill the secondary

containment system and that HCl emissions would result from the devolution of HCl vapour from the secondary containment system. The surface area of the secondary containment system is approximately 911 square metres.

Scenario 6.a Transportation Accident: Hydrochloric Acid Tank Truck

Hydrochloric acid would be transported to local customers using 4,000-gallon (15,142-litre) tank trucks travelling on public roads. An accidental release could result from an offsite transportation accident, potentially involving another vehicle. A release resulting from a transportation accident would be assumed to involve damage to the 2-inch (5-centimetre) diameter truck fill pipe and subsequent release of 50 percent of the volume of the tank truck. The 2,000-gallon (7,570-litre) release would occur over approximately 8 minutes and would be assumed to be uncontained. For this scenario, the hydrochloric acid release is assumed to occur over a paved area (e.g., a roadway) and the liquid release would remain in the paved area until it is neutralized by emergency responders. The spread of the liquid release is assumed to be constrained due to the assumed presence of roadway structures (e.g., curbs, shoulders, drainage, slope). The area of confinement is taken as 30% of the area of a totally unconstrained spill, resulting in an approximate surface area of the liquid release of 227 square metres.

3.1.4 Sodium Hypochlorite Release Scenarios

The vapour over a 12-percent sodium hypochlorite solution will contain hypochlorous acid at high pH values, but chlorine gas can be released if the pH is lowered (Lee and Lin 2007). Sodium hypochlorite solutions are stored at pH values between 11 and 12 to slow down decomposition (The Chlorine Institute 2006), so a likely release would involve limited releases of hypochlorous acid. However, chlorine releases will tend to pose a larger public health threat, so the accidental release modelling assumes the pH is lowered to 5.5, causing a release of chlorine gas as a worst-case scenario. To lower the pH to this level would require a highly acidic material present at the spill site or applied to the spill through human error during spill response. Thus, these scenarios are very unlikely.

Scenario 2.c Vessel Failure: Onsite Hypochlorite Tank

An accidental release of liquid hypochlorite could occur from vessel failure of one of the four onsite hypochlorite acid storage tanks, resulting in a maximum 45,000-gallon (170,340-litre) release. For this scenario, it is assumed that a breach in the tank causes the tank to empty at a rate of approximately 737 kilograms per second, resulting in a total release of the tank contents over a 19-minute period. This release would involve the 12-percent hypochlorite product. Any such release would be contained in the secondary containment system for the vessel. For this scenario, it is assumed that a catastrophic failure of the vessel would fill the secondary containment system and that emissions would result from the devolution of chlorine gas from the secondary containment system. The surface area of the secondary containment system is approximately 426 square metres. At an assumed pH of 5.5, the pool would release chlorine gas at a rate of 1.7 kilograms per second for 3 minutes. Full derivations of these assumptions are presented in Section 4. This event might occur if, through human error, an acidic material were applied to the spill. This is unlikely to occur on account of emergency response training in procedures established to respond to spill events.

Scenario 6.b Transportation Accident: Hypochlorite Tank Truck

Hypochlorite would be transported to local customers using 4,000-gallon (15,142-litre) tank trucks travelling on public roads. An accidental release could result from an offsite transportation accident, potentially involving another vehicle. A release resulting from a transportation accident is assumed to involve damage to the 2-inch (5-centimetre) diameter truck fill pipe and subsequent release of 50 percent of the volume of the tank truck. The 2,000-gallon (7,570-litre) hypochlorite release is assumed to occur over a paved area (e.g., a roadway) and the liquid release remains in the paved area it is until neutralized by emergency responders. The spread of the liquid release is assumed to be constrained due to the assumed presence of roadway structures (e.g., curbs, shoulders, drainage, slope). The area of confinement is taken as 30% of the area of a totally unconstrained spill, resulting in an approximate surface area of the liquid release of 227 square metres. At an assumed pH of 5.5, the pool would release chlorine gas at a rate of 1.0 kilogram per second for 30 seconds. Full derivations of these assumptions are presented in Section 4. This event might occur if, through human error, acidic material were applied to the spill or the truck accident involved another vehicle carrying a strong acid such as sulphuric or hydrochloric. Human error is unlikely to occur on account of established emergency training procedures to respond to spill events. The incident of two trucks carrying hazardous materials being involved in a single accident is also very unlikely considering the small amount of such truck traffic as compared to the amount of general vehicle traffic on the roads.

3.1.5 Offsite Natural Gas Release Scenario

Scenario 4.b Offsite Natural Gas Deflagration (CH_4 release)

CariSal would make a 6-inch (15-centimetre) minimum or 8-inch (20-centimetre) maximum diameter tie-in to the existing Natural Gas Corporation (NGC) 24-inch (61-centimetre) Residue Gas Header to supply natural gas to the CariSal site via a metering station on the CariSal site. The line length from the NGC 24-inch (61-centimetre) pipeline to the metering station on the CariSal site is anticipated to be approximately 20 metres.

The residue gas pressure is approximately 340 to 360 psig (24.5 to 26 bar). A release of the entire volume of natural gas from the pipeline between the shutdown valves at the Residue Gas Header and the CariSal onsite metering station would involve 0.65 cubic metres of natural gas at release pressure, equivalent to 16.6 standard cubic metres of natural gas at standard atmospheric pressure.

For this scenario it is assumed that the released gas ignites immediately upon release at the point of the release.

3.2 Scenario Probability Assessment

3.2.1 Overview

Table 3.2.1-1 provides a summary of the frequency of occurrence of each scenario. Frequencies are provided for each scenario with and without application of mitigation. Mitigation measures

applicable to each scenario are described in this section. These mitigations are an integral part of the proposed design rather than potential measures that might be applied. Both the mitigated and unmitigated frequencies for each scenario are applied in estimating the individual risk and societal risk associated with the release scenarios as described in Sections 3.4 and 3.5 and as required by the EMA. Frequencies are not estimated for scenarios for which modelling indicated no offsite impacts.

Table 3.2.1-1: Summary of Scenario Probabilities

No.	Scenario	Type	Event	Frequency[a]	Mitigated Frequency	Length of Piping (m)	Overall Frequency
1.	*Onsite hazardous material (gaseous) release*						
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	Full breach	$1x10^{-6}$ /yr	$1x10^{-9}$ /yr	30	$2.7x10^{-11}$/yr-m
1.a.2	Chlorine [outdoor] process pipe breach	Cl_2 release	Full breach	$1x10^{-6}$ /yr	$1x10^{-9}$ /yr	75	$1.3x10^{-11}$/yr-m
1.a.3	Chlorine process pipe breach [seismic event]	Cl_2 release	Seismic	$1x10^{-6}$ /yr	$1x10^{-8}$ /yr	150	$6.7x10^{-11}$/yr-m
1.b	Intermixing of Hypochlorite with HCl	Cl_2 release	Probable	$1x10^{-7}$ /yr	$1x10^{-7}$ /yr	NA	
2.	*Onsite hazardous material (liquid) release*						
2.a	Vessel Failure: Onsite NaOH storage tank	NaOH spill	Full Breach	---	[b]	---	
2.b	Vessel Failure: Onsite HCl storage tank	HCl spill	Full Breach	$1x10^{-6}$ /yr	$1x10^{-8}$ /yr	150	$6.7x10^{-11}$/yr-m
2.c	Vessel Failure: Onsite hypochlorite storage tank	bleach spill	Full Breach	$1x10^{-6}$ /yr	$1x10^{-6}$ /yr	150	$6.7x10^{-11}$/yr-m
3.	*Flammable gas release (dispersion)*						
3.a.1	Hydrogen [indoor] process pipe breach	H_2 release	Full Breach	---	[b]	---	
3.a.2	Hydrogen [outdoor] process pipe breach	H_2 release	Full Breach	---	[b]	---	
3.a.3	Hydrogen process pipe breach [seismic event]	H_2 release	Full Breach	---	[b]	---	
3.b.1 3.b.2	Hydrogen vent stack release HCl scrubber stack release	H_2 release H_2 release	Probable Probable	---	[b]	---	
4.	*Flammable gas release (deflagration)*						
4.a	Onsite Natural gas deflagration	CH_4 release	Line leak	---	[b]		
4.b	Offsite Natural gas deflagration	CH_4 release	Line leak	$1x10^{-6}$ /yr	$1x10^{-6}$ /yr	20	$5x10^{-8}$ /yr-m
5	*Offsite facility hazardous material release*						
5.a	Vessel Failure: Offsite EISL Facility caustic tank breach	NaOH spill	Full Breach	---	[b]	---	
5.b	Offsite caustic pipeline breach	NaOH spill	Full Breach	---	[b]	---	
6.	*Offsite transportation hazardous material release*						
		Type	Event	Frequency[a]	Mitigated Frequency		
6.a	Hydrochloric acid: 4,000 gallon tank truck accident	HCl spill	Probable	$3x10^{-7}$ /yr	$1x10^{-7}$ /yr		
6.b	Hypochlorite: 4,000 gallon tank truck accident	bleach spill	Probable	$3x10^{-7}$ /yr	$3x10^{-7}$ /yr		

[a] Event frequency is estimated based on the CariSal process design standards for onsite and offsite release scenarios. Source: ABS Consulting. 2008. *Report and Findings for Qualitative Risk Assessment and Safety Case Support for the CariSal Chlor-Alkali Plant Point Lisas Industrial Estate, Couva, Trinidad and Tobago, W.I.*, Summary Table, ABS Consulting, November 24.

[b] No modelled offsite consequences are associated with these release scenarios, therefore event frequencies are not reported.

3.2.2 Chlorine Release Scenarios

Scenario 1.a.1 Indoor Chlorine Release Scenario

The mitigated frequency of the indoor process pipe break (full breach) scenario is 1.0×10^{-9} per year. Each electrolyser unit contains approximately 30 metres of 12-inch (30-centimetre) diameter indoor chlorine process piping. The mitigated frequency corresponds to an overall frequency of 2.7×10^{-11} per year per metre of piping. [Note: Because the initial frequencies are

given in rough orders of magnitude, minor variations will result when these rounded frequencies are divided by specific lengths of piping.] Mitigation factors that reduce the frequency of this scenario include material selection and pressure testing of process piping, overpressure and differential pressure interlocks, and area chlorine release monitoring systems. The electrolyser units automatically shut down in the event of a loss of electric power or detection of a chlorine release by the monitoring system, and differential and overpressure interlocks isolate the process piping in the event that the pressure in the process pipe exceeds process control thresholds.

Scenario 1.a.2 Outdoor Chlorine Release Scenario

The mitigated frequency of the outdoor process pipe break (full breach) scenario is 1.0×10^{-9} per year. Each electrolyser unit contains approximately 75 metres of 12-inch (30-centimetre) diameter outdoor chlorine process piping. The mitigated frequency corresponds to an overall frequency of 1.3×10^{-11} per year per metre of piping. Mitigation factors that reduce the frequency of this scenario include material selection and pressure testing of process piping, overpressure and differential pressure interlocks, and area chlorine release monitoring systems. The electrolyser units automatically shut down in the event a loss of electric power or detection of a chlorine release by the monitoring system, and differential and overpressure interlocks isolate the process piping in the event that the pressure in the process pipe exceeds process control thresholds.

Scenario 1.a.3 Outdoor Chlorine Release Scenario (Seismic Event)

For a seismic event, 150 metres of piping (i.e., both electrolyser units) would be involved in the release scenario. The mitigated frequency of the outdoor process pipe break (seismic event) is 1×10^{-8} per year, corresponding to an overall frequency of 6.7×10^{-11} per year per metre of piping.

Scenario 1.b Intermixing of Hypochlorite with HCl (Cl_2 Release)

The original and mitigated frequency of the intermixing of hypochlorite with liquid HCl scenario is 1×10^{-7} per year. Mitigation factors that reduce the frequency of this scenario include design specification of incompatible fill nozzles for hydrochloric acid trucks and sodium hypochlorite trucks. The use of incompatible nozzles significantly minimizes the probability of human error that could otherwise lead to an intermixing incident.

3.2.3 Hydrochloric Acid Release Scenarios

Scenario 2.b Vessel Failure: Onsite Hydrochloric Acid Tank (Full Breach Event)

The mitigated frequency of the hydrochloric acid tank release (full breach) scenario is 1.0×10^{-8} per year. Mitigation factors that reduce the frequency of this scenario include material selection and mechanical procedures for the storage tanks and associated piping, scheduled inspection and maintenance procedures for the tanks and associated piping, valves, and fittings, secondary containment systems for the storage tanks, and situating limestone within the secondary containment system such that release of hydrochloric acid would be subject to neutralization by the limestone.

Scenario 6.a Transportation Accident: Hydrochloric Acid Tank Truck

The mitigated frequency of a hydrochloric acid tank truck transportation accident (probable event) is 1.0×10^{-7} per year. Mitigation factors that reduce the frequency of this scenario include use of specialized tank trucks for transportation of hydrochloric acid, and shipping and receiving schedule notifications.

3.2.4 Sodium Hypochlorite Release Scenarios

Scenario 2.c Vessel Failure: Onsite Hypochlorite Tank (Full Breach Event)

The original and mitigated frequency of the hypochlorite tank release (full breach) scenario is 1.0×10^{-6} per year. Mitigation factors that reduce the frequency of this scenario include material selection and mechanical procedures for the storage tanks and associated piping, scheduled inspection and maintenance procedures for the tanks and associated piping, valves, and fittings, and secondary containment systems for the storage tanks.

Scenario 6.b Transportation Accident: Hypochlorite Tank Truck

The original and mitigated frequency of a hypochlorite tank truck transportation accident (probable event) is 3×10^{-7} per year. Mitigation factors that reduce the frequency of this scenario include use of specialized tank trucks for transportation of hypochlorite, and shipping and receiving schedule notifications.

3.2.5 Offsite Natural Gas Release Scenario

Scenario 4.b Offsite Natural Gas Deflagration (CH_4 release)

The original and mitigated frequency of an offsite natural gas release (probable event) from the tie-in to the CariSal site is 1×10^{-6} per year. Mitigation factors that reduce the frequency of this scenario include routine pipeline inspection and maintenance, gas sensors, and pressure sensors. In the event of a line leak from the tie-in, the leak would be detected by gas sensors and by pressure and volume sensors that would close the emergency shutdown valves on the pipeline, thereby reducing the amount of gas leaking to the environment. Pressure sensors similarly protect the NGC's header and emergency shutdown valves.

3.3 Consequence Modelling Methodology

3.3.1 Overview

The SLAB model and the ALOHA® model were applied to estimate releases of hazardous vapours for the release scenarios. The ALOHA® model was used to model Scenario 1.a.1, the indoor chlorine process pipe release scenario, because the SLAB model cannot model indoor releases. The ALOHA® model also was used to model Scenario 4.b, the offsite natural gas release scenario, because the SLAB model cannot model fire and explosion events. The outdoor chlorine process pipe release scenarios were modelled using the SLAB model. For the hydrochloric acid liquid pool release scenarios (Scenario 2.b and Scenario 6.a), the ALOHA®

model was used to estimate the rate of hydrochloric acid vapour evaporation from the liquid pool formed by the hydrochloric acid liquid release, and the SLAB model was then used to model the dispersion of the vapour released. This approach was used because SLAB cannot directly estimate the amount of vapour evaporated from a liquid pool.[1]

Table 3.3.1-1 provides a summary of accident scenario information for the onsite hazardous materials release, offsite fixed facility, flammable gas, and transportation scenarios. Scenarios for the offsite fixed facilities did not illustrate offsite consequences so these scenarios are not discussed further.

Table 3.3.1-1: Accident Scenario Information – Onsite Hazardous Materials Release and Offsite Fixed Facility, Flammable Gas, and Transportation Scenarios

Description Accidental Release Scenario	Release height (m)	Release temp (° C)	Release velocity	Release Duration (seconds)	Pressure (psia)	Total Material Release		Vapour release rate (kg/s) (Hazardous Material)	
						Gallons (m^3)	Kg		
Onsite Hazardous Material (Gaseous Cl_2 release)									
1.a.1 Chlorine [indoor] process pipe breach	1	Ambient	100,000 Nm^3/hr	30	Ambient	--	47	1.6	Cl_2
1.a.2.a Chlorine [outdoor] process pipe breach [full breach]	4	40	12-inch (30-centimetre) diameter pipe	30	17.84 (1.23 bar)	--	47	1.6	Cl_2
1.a.3 Chlorine [outdoor] process pipe breach [seismic event]	4	40	12-inch (30-centimetre) diameter pipe	30	17.84 (1.23 bar)	--	94	3.2	Cl_2
1.b. Intermixing of Hypochlorite with HCl	4	Ambient		180	Ambient	--	54	0.3	Cl_2
Onsite Hazardous Material (Liquid)									
2.a Vessel Failure: Onsite NaOH storage tank									
2.b Vessel Failure: Onsite HCl storage tank [full breach]	1	Ambient	12-inch (30-centimetre) diameter breach	3600	Ambient	400,000 (1,514 m^3)		0.5	HCl
2.c Vessel Failure: Onsite hypochlorite tank [full breach]	1	Ambient	12-inch (30-centimetre) diameter breach	169	Ambient	45,000 (170 m^3)		1.7	Cl_2[b]
Offsite Fixed Facility Scenarios									
4.b Offsite Natural gas deflagration	1	Ambient	Instantaneous release	Inst.	365	--- (0.65 m^3)	---	---	CH_4
Offsite Fixed Facility Scenarios									
5.a Offsite caustic pipeline breach	a								
5.b Offsite EISL facility caustic tank breach	a								

[1] A list of the scenarios to be modelled with SLAB and ALOHA and a rationale for that determination was submitted to, and approved by, the EMA in December 2008/January 2009.

Table 3.3.1-1: Accident Scenario Information – Onsite Hazardous Materials Release and Offsite Fixed Facility, Flammable Gas, and Transportation Scenarios

Description Accidental Release Scenario	Release height (m)	Release temp (° C)	Release velocity	Release Duration (seconds)	Pressure (psia)	Total Material Release		Vapour release rate (kg/s) (Hazardous Material)	
						Gallons (m^3)	Kg		
Offsite Transportation Scenarios									
6.a. Hydrochloric acid: tank truck accident	1	Ambient	2-inch (5-centimetre) diameter pipe	3600	Ambient	2,000 (7.5 m^3)		0.1	HCl
6.b. Hypochlorite (bleach product): tank truck accident	1	Ambient	2-inch (5-cenimetre) diameter pipe	30	Ambient	2,000 (7.5 m^3)		1.0	Cl_2[b]

[a] According to the April 1999 U.S. EPA Guidance Document on accidental release modelling (U.S. Environmental Protection Agency 1999), toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 millimetres of mercury (mm Hg.). The vapour pressure of 50-percent sodium hydroxide solution at ambient temperature (20 degrees C) is approximately 1.5 mm Hg and the vapour pressure is approximately 6 mm Hg at a temperature of 40 degrees C (FMC Corporation 2004). Therefore, potential air emissions from liquid spills of NaOH solution have not been quantitatively modelled in this risk assessment.

[b] The vapour over a 12-percent sodium hypochlorite solution contains chlorine (The Chlorine Institute 2006). The available chlorine in a 12-percent solution is 11.5 percent by volume. For the purposes of accidental release modelling, the vapour devolved from the liquid sodium hypochlorite release is assumed to be chlorine.

Table 3.3.1-2 provides a summary of storage tank containment system volumes and surface areas used in the accidental release modelling for hydrochloric acid storage tank and hypochlorite storage tank releases. Containment systems would be designed to contain 110 percent of the volume of the storage tank, as reported in the EIA.

Table 3.3.1-2: Intermediate and Product Storage Tank Containment Volumes

Storage Tank	Storage Tank Volume (Gallons)	Containment Volume [a] (Gallons)	Containment Height (feet)	Containment Area (square feet)
Onsite Hypochlorite	4 tanks, each 45,000 (each 170 m^3)	205,700 (779 m^3)	6 (1.8 m)	4,584 (426 m^2)
Onsite HCl	400,000 (1,514 m^3)	440,000 (1,666 m^3)	6 (1.8 m)	9,803 (911 m^2)

[a] Containment volumes are estimated based on 110 percent of the total storage tank volume and a containment system height of 6 feet (1.8 metres).

Table 3.3.1-3 provides a summary of the release volumes, assumed percent containment, and resulting liquid pool areas used in the accidental release modelling for hydrochloric acid and hypochlorite tank truck releases. Based on the assumed occurrence of roadway structures (e.g., curbs, shoulders, drainage, and slope) that would provide some containment of the liquid spills, it is assumed that the liquid pool surface area would be 30 percent of the surface area of an uncontained liquid spill.

Table 3.3.1-3: Truck Accident Liquid Release Containment Volumes

Tank Truck	Tank Truck Volume (Gallons)	Release Volume (Gallons)	Spill Containment	Liquid Spill Area (square feet)
Hypochlorite	4,000 (15 m^3)	2,000 (7.6 m^3)	30 percent	2,447 (227 m^2)
Hydrochloric Acid	4,000 (15 m^3)	2,000 (7.6 m^3)	30 percent	2,486 (231 m^2)

3.3.2 SLAB Model

SLAB is a computer model that estimates downwind plumes formed as a result of the release of heavier-than-air gases in the form of evaporating pool releases, horizontal jet releases, or vertical jet releases (LLNL 1990). The model inputs include the release type; chemical-specific parameters such as the boiling point and vapour heat capacity; spill properties such as the area of the release, the duration of the release, and the mass source rate; field parameters such as the time over which to average the plume concentrations, the maximum downwind distance at which to model the release, and the height at which to evaluate the concentrations; and meteorological parameters such as the wind speed, temperature, humidity, surface roughness, and stability class. For horizontal or vertical jet releases, the emission can occur as either gas or a mixture of liquid and gas, assuming the gas is stored under pressure. However, for the evaporating pool release, the mass source rate must be specified as a vapour emission rate, which is best described as an evaporation rate in units of mass per time.

The user specifies the maximum model evaluation distance in metres. SLAB then builds the model domain in the direction of the wind by concentrating points near the release and gradually increasing the distance between points further afield. This process ensures ample model resolution in the areas of greatest concentration gradient. SLAB also calculates the approximate plume half width for each point.

The output of the model includes time-averaged concentrations at the modelled gridpoints. These concentrations are provided at every point along the direction of the wind for crosswind points corresponding to 0, 0.5, 1, 1.5, 2, and 2.5 times the plume half width. These points can then be reflected across the wind axis to generate the full symmetric plume grid. If one wishes to model the release out to a specific threshold concentration, the model runs must be performed iteratively to ensure that the user-specified maximum downwind distance is large enough to capture the threshold concentration but small enough to ensure adequate resolution.

SLAB models outdoor releases and does not include any parameterization of air exchange rates or the spread of chemical spills from an indoor environment outdoors. Thus, the model is best suited for modelling outdoor releases. SLAB also does not include the capability to model explosions resulting from flammable releases.

For the purposes of this assessment, SLAB was downloaded from http://www.lakes-environmental.com/lakeepa4.html. A processor tool was built in Microsoft Excel® to enable batch mode runs of multiple scenarios and efficient processing of the results into a format necessary for the geographic information system (GIS) population analysis. A complete list of the model parameters for each scenario is given in Appendix D.

3.3.3 ALOHA® model

The ALOHA® model is an emergency response model developed for response and planning purposes (USEPA 2007). Many accident types can be modelled, including direct releases of gas and evaporating liquid pool releases, as well as fire and explosion scenarios. ALOHA® requires

location, chemical, spill, and meteorological parameters as input. Unlike SLAB, ALOHA® can accept information about the areal extent of a pool spill, chemical parameters of the spill, and meteorological conditions to estimate the evaporation rate from the pool. However, ALOHA® does not provide the freedom to specify the time over which the plume should be averaged; instead, it plots contours of locations where the peak concentration reaches a specific threshold. Because health criteria are often specified over a specific averaging time, ALOHA® is conservative compared with a model that can average the concentrations.

Because it can specifically handle indoor releases and explosion scenarios, ALOHA® was selected for the corresponding accident scenarios. SLAB was used for all other outdoor release scenarios. However, for the hydrochloric acid spills, ALOHA® was run first in order to estimate the evaporation rate and the average evaporation rate was then input into SLAB.

For this assessment, ALOHA® was downloaded from http://www.epa.gov/emergencies/content/cameo/ALOHA® .htm. Because the location database is not included in the model, the Point Lisas, Trinidad and Tobago location was entered using the parameters shown in Table 3.3.3-1. The chemical parameters for chlorine gas and for 36-percent hydrochloric acid solution were used because they are contained in the chemical database released with the model for the accident release scenarios.

Table 3.3.3-1: Port Lisas Location Settings in ALOHA®

Model Parameter	Setting
Location	Port Lisas
Is location in a US state or territory?	No
Approximate elevation	33 ft (10 m)
Approximate location longitude	61 deg, 28.0 min W
Approximate location latitude	10 deg, 24.0 min N
Country name	Trinidad and Tobago
Offset from local STANDARD time to GMT	4.00 hours
Is current model time standard or daylight savings time?	Standard

As output, ALOHA® provides a plot of a user-specified threshold. As stated above, this contour corresponds to locations where the peak concentration reaches the threshold. To process the output for use in the GIS population analysis, the approximate location of the contour was located by clicking the mouse along the edge of the curve at 26 distinct points. This action produces a plot showing the exact coordinates of the selected point. These points were then noted and exported to GIS.

3.3.4 Meteorological Data

3.3.4.1 Wind Speed

The modelling results used for the societal risk analysis are based the Point Lisas 5th percentile wind with the stability class F condition. Model runs were conducted at various combinations of

wind and stability classes as a sensitivity analysis, and the 5th percentile and stability class F condition generated the highest distance to threshold results for virtually all scenarios. This combination of wind and stability class is likely to occur only at night. Also, the models were run for both the dry and wet season meteorological data but they gave the same distance to the threshold results, so only dry season results are presented graphically and only the dry season results are used for the societal risk analysis.

3.3.4.2 Wind Rose Data

Recent wind rose data are available from the EMA as collected from their air quality and meteorological monitoring site located in Point Lisas, which is located about 4.1 kilometres (km) north-northwest of the Project site. Wind roses from the EMA monitoring site at Point Lisas are shown in Figures 3.3.4-1 and 3.3.4-2 for 2005 and 2006, respectively. These two sites show the same consistent wind pattern. However, unlike Piarco, both stations show a pronounced southeast wind component. Calm winds occur about 22 – 23 percent of the time. The wind pattern found at the EMA site is most representative of the Project site.

3.3.4.3 Wind Direction Probabilities

Wind data collected for Point Lisas (2005 – 2006) are shown in Tables 3.3.4-1 and 3.3.4-2. The percentages of time the wind is in each direction during the wet season and during the dry season, shown in Tables 3.3.4-1 and 3.3.4-2, were used to estimate the population within each sector direction, as described in Section 3.6 below.

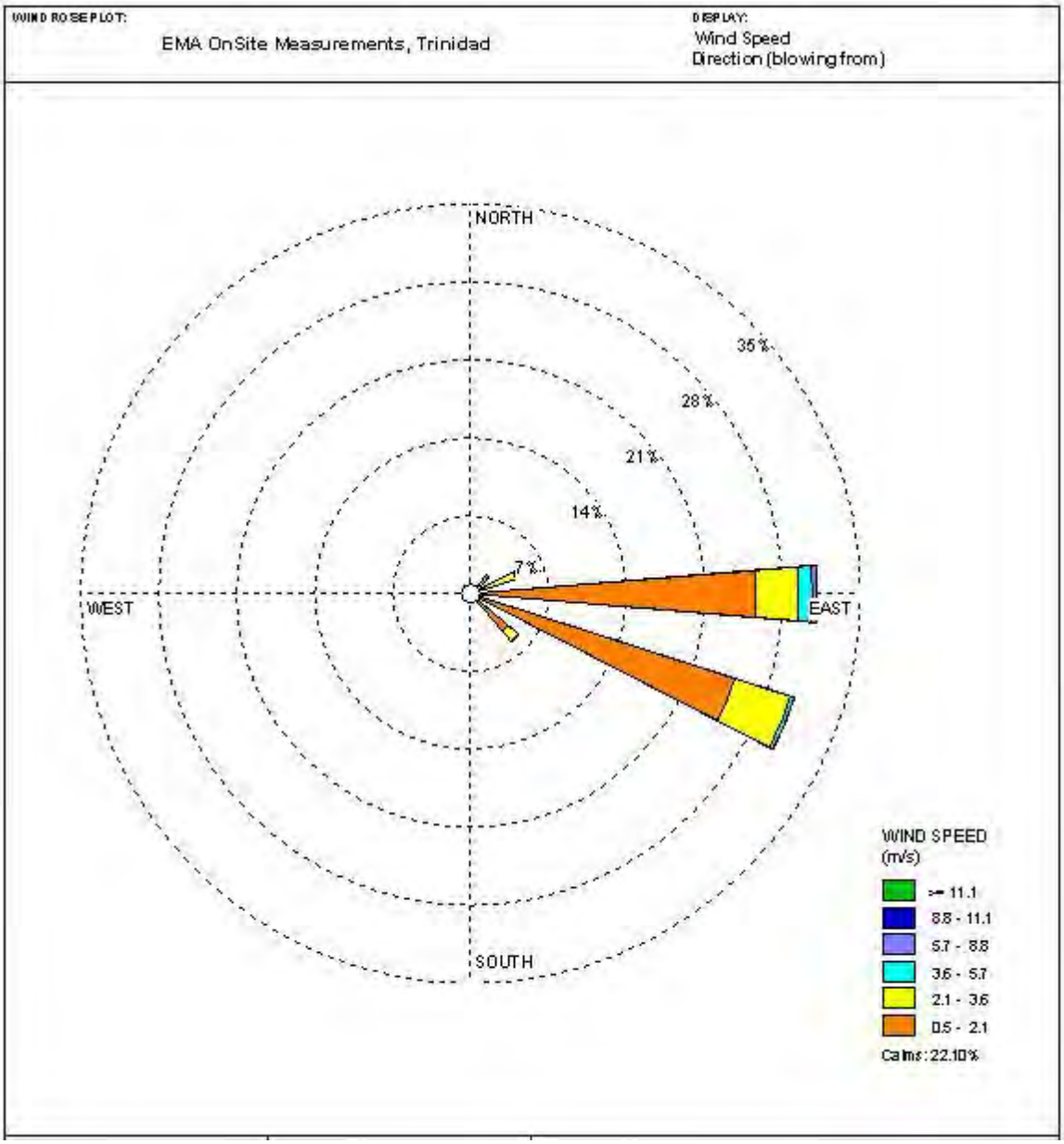


Figure 3.3.4-1: Wind Rose at the EMA Monitoring Station at Point Lisas, 2005 (EMA 2004-2007).

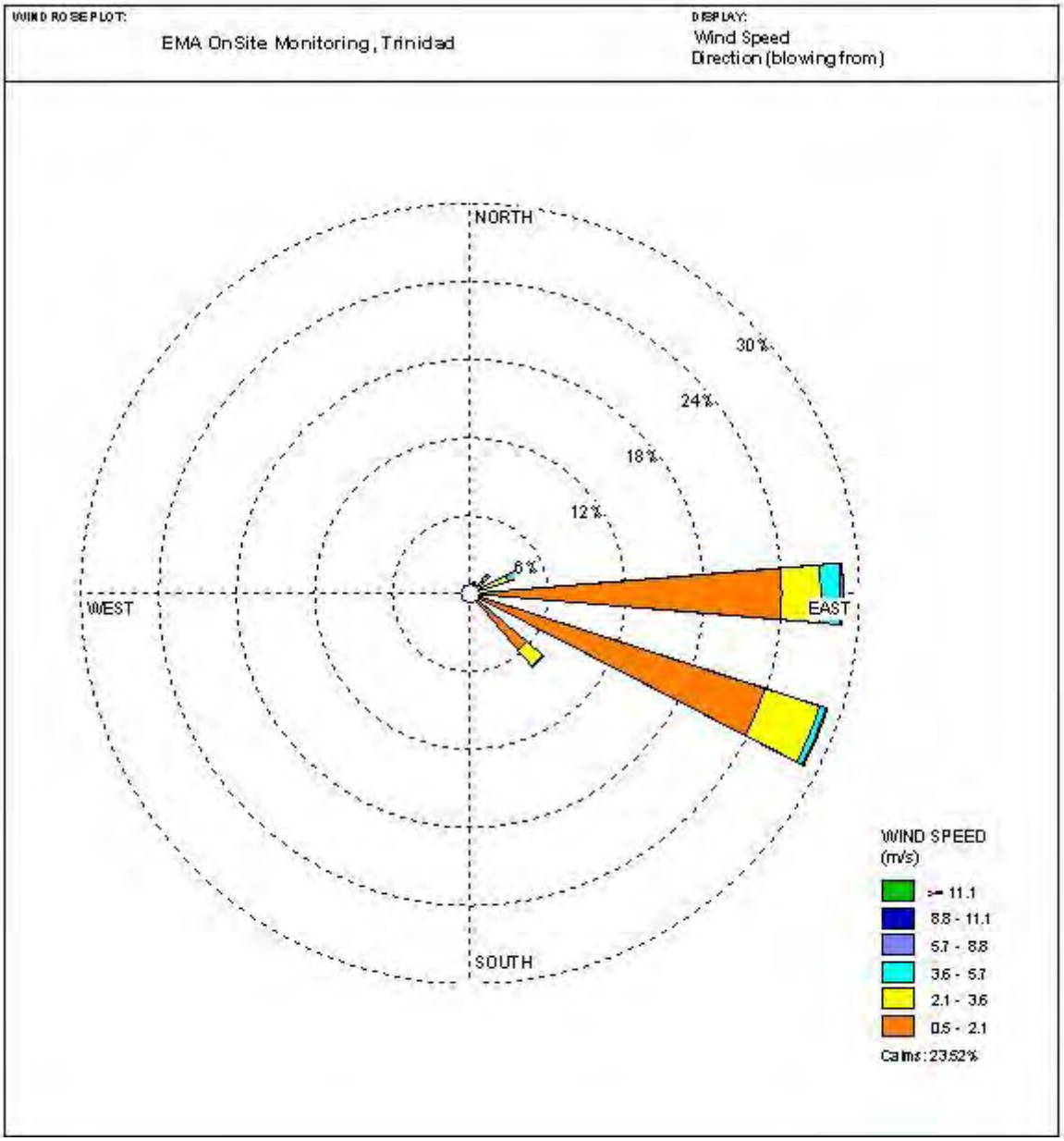


Figure 3.3.4-2. Wind Rose at the EMA Monitoring Station at Point Lisas, 2006 (EMA 2004-2007).

Table 3.3.4-1: Wet Season Wind Data (%): Wind Rose Point Lisas Wet Season (2005–2006) Based on EMA's Point Lisa's Meteorological Data (Source: EMA, 2004-2007)

Wind Direction	5.00E-01 – 1.00E+00	1.00E+00 – 2.00E+00	2.00E+00 – 3.00E+00	3.00E+00 – 4.00E+00	4.00E+00 – 5.00E+00	5.00E+00 – 1.00E+02	Total Obs.	Percent
0	31	64	3	0	0	0	98	1.11%
22.5	34	30	0	0	0	0	64	0.72%
45	246	29	0	0	0	0	275	3.11%
67.5	1208	206	0	0	0	0	1414	16.01%
90	1960	873	114	0	0	0	2947	33.37%
112.5	747	1085	211	0	0	0	2043	23.13%
135	195	385	102	0	0	0	682	7.72%
157.5	90	123	18	0	0	0	231	2.62%
180	36	72	5	0	0	0	113	1.28%
202.5	8	31	10	0	0	0	49	0.55%
225	5	18	7	0	0	0	30	0.34%
247.5	6	20	1	0	0	0	27	0.31%
270	4	16	2	0	0	0	22	0.25%
292.5	6	5	3	0	0	0	14	0.16%
315	6	5	0	0	0	0	11	0.12%
337.5	24	76	20	0	0	0	120	1.36%
Total	4606	3038	496	0	0	0	8140	
CALM OBSERVATIONS							692	7.84%
TOTAL OBSERVATIONS							8832	100.00%

Table 3.3.4-2: Dry Season Wind Data (%): Wind Rose Point Lisas Dry Season (2005–2006) Based on EMA's Point Lisa's Meteorological Data (Source: EMA, 2004-2007)

Wind Direction	5.00E-01 – 1.00E+00	1.00E+00 – 2.00E+00	2.00E+00 – 3.00E+00	3.00E+00 – 4.00E+00	4.00E+00 – 5.00E+00	5.00E+00 – 1.00E+02	Total Obs.	Percent
0	26	58	18	0	0	0	102	1.17%
22.5	47	29	0	0	0	0	76	0.87%
45	315	53	3	0	0	0	371	4.27%
67.5	1087	303	10	0	0	0	1400	16.11%
90	1553	1048	268	1	0	0	2870	33.03%
112.5	619	1324	765	4	0	0	2712	31.22%
135	79	240	212	2	0	0	533	6.13%
157.5	21	34	15	1	0	0	71	0.82%
180	6	11	1	0	0	0	18	0.21%
202.5	1	2	0	0	0	0	3	0.03%
225	0	3	0	0	0	0	3	0.03%
247.5	1	1	0	0	0	0	2	0.02%
270	3	2	0	0	0	0	5	0.06%
292.5	3	2	1	0	0	0	6	0.07%
315	4	6	1	0	0	0	11	0.13%
337.5	11	75	64	0	0	0	150	1.73%
Total	3776	3191	1358	8	0	0	8333	
CALM OBSERVATIONS							355	4.09%
TOTAL OBSERVATIONS							8688	100.00%

3.4 Individual Risk Methodology

The development of individual risk contours requires information on scenarios of concern and release frequencies (Section 3.2), potential consequences of each release for each meteorological condition (Section 3.3), and release locations. To develop the risk contours, the frequency of having impacts at various distances must be determined, by analyzing each individual risk scenario's contribution. A risk scenario is defined by the:

- release frequency
- wind direction (a single stability class and wind speed combination has been assumed – which is conservative)
- area and extent of the hazard zone, for the given release size and stability/wind speed
- release location and distance to fence line in each direction

The predicted likelihood of achieving various distances in each direction is calculated by summing the frequency contributions of all release scenarios, scaled by the likelihood of that direction and the chance of a fatality, given exposure, that achieve or exceed a specified distance. Contours or isopleths of constant risk can then be drawn. Typically, such contours are prepared for 10^{-4}, 10^{-5}, 10^{-6}, and 10^{-7} per year.

For completeness, the calms in the wind rose have also been distributed across the 16 segments of the wind rose (proportional to their likelihoods).

3.5 Societal Risk Methodology

Figure 3.5-1 shows the Societal Risk Guidelines based on the Netherlands Curve. The F-N Curve relates the scenario frequencies with the number of anticipated fatalities.

The number of offsite residential individuals within the threshold area for each scenario is estimated using year 2000 census data and the frequency of wind direction. The number of offsite industrial workers within the threshold area for each scenario is estimated from the locations and employment data for neighbouring industrial facilities and the frequency of wind direction. The modelling thresholds and averaging times for chlorine and for hydrochloric acid used in this analysis are shown in Tables 3.5-1 and 3.5-2. (Appendix B to this Addendum presents information on the inhalation toxicology of hydrogen chloride.) The thresholds and averaging times are based on a 10-percent fatality rate, that is, an exposure of 140 ppm (406 mg/m^3) chlorine for an averaging time of 10 minutes or an exposure of 80 ppm (172 mg/m^3) chlorine for an averaging time of 30 minutes corresponds to 10-percent fatality among exposed individuals. Therefore, the total number of individuals estimated to be within the threshold area for each scenario is multiplied by 10 percent to estimate the number of anticipated fatalities for each scenario.

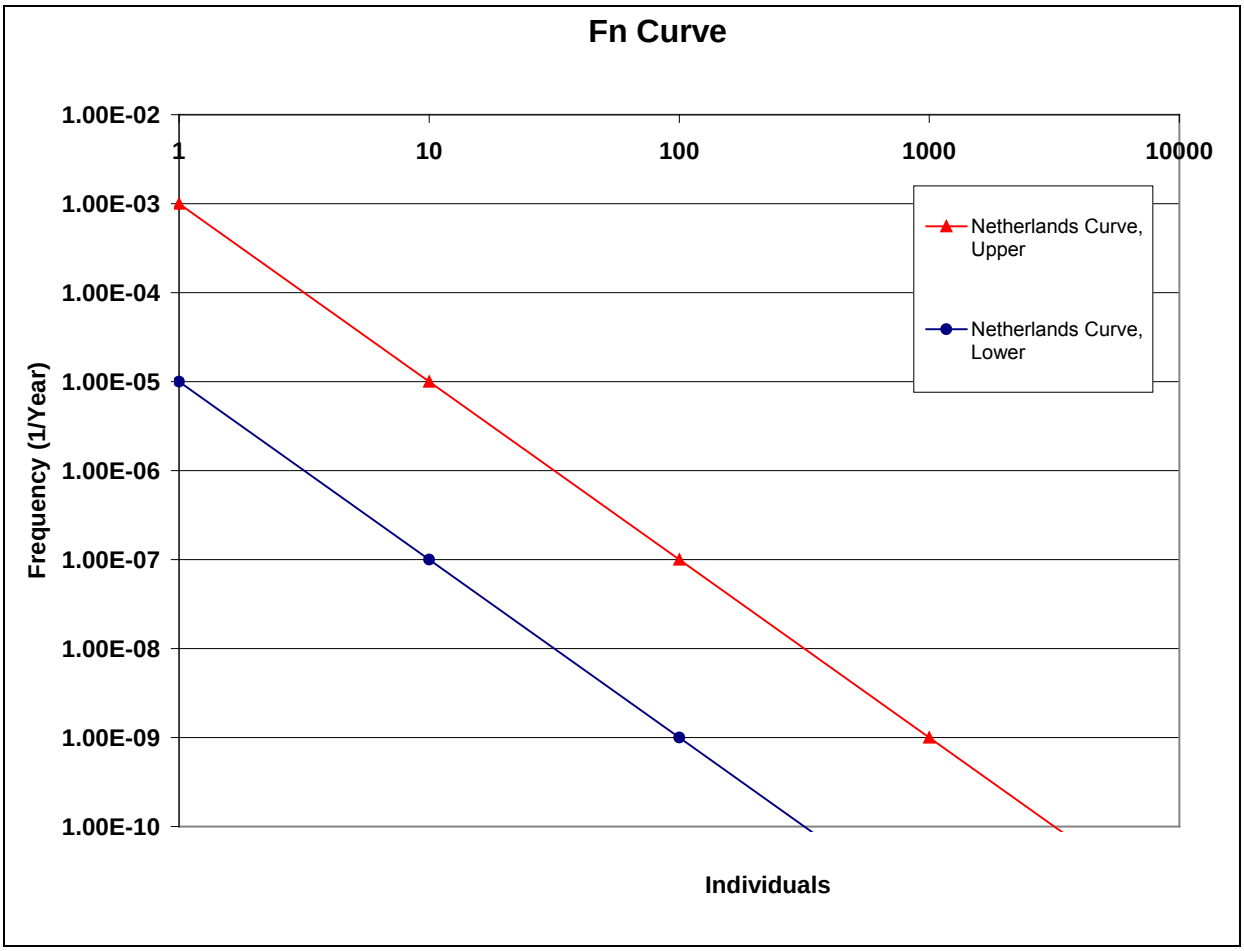


Figure 3.5-1: F-N Curve Based on Netherlands Curves.

The societal risk analysis sums the frequencies of all scenarios and sub-scenarios that produce at least one fatality and plots that value against 1 modelled fatality on the F-N Curve. Similar calculations are made for all scenarios/sub-scenarios that result in at least three modelled fatalities, at least ten modelled fatalities, and so on, and these results are plotted against three fatalities, ten fatalities, and so on, on the F-N Curve.

Table 3.5-1: Chlorine Lethal after 10-minute Exposure

Threshold Concentration		Averaging Time	Population Fatality
Parts per million (ppm)	Milligrams/cubic meter	Minutes	Percent
140	406	10	10
80	172	30	10

Wither, R.M.J., and Lees, F.P. 1985. The Assessment of Major Hazards: The Lethal Toxicity of Chlorine: Part 1 – Review of Information on Toxicity. *Journal of Hazardous Materials* 12:231-282. Elsevier Science Publishers B.V., Amsterdam, The Netherlands.

Table 3.5-2: Hydrochloric Acid Lethal after 30-minute Exposure

Threshold Concentration		Averaging Time	Population Fatality
Parts per million (ppm)	Milligrams/cubic meter	minutes	Percent
4,000	5,965	30	10

3.6 Population Data

The residential population data used for the societal risk analysis are based on the 2000 Census and local census boundaries. For each scenario modelled, the threshold area was overlaid onto the census boundaries. The population analysis was conducted as a typical geospatial task known as proportion overlay. Proportion overlay analysis is used to determine a ratio as a multiplier for demographic data. The analysis determined how much area of a census boundary is overlapped by a given census polygon (in this case, the scenario plumes). The area that overlaps was taken as a percentage of the original area of the census boundary. That percentage was used as the ratio multiplier and applied to determine the "assumed" population that lives within the plume. The major assumption made by conducting the analysis this way is an even distribution of population within a census boundary. An even distribution is obviously not exactly realistic, as in most cases people live grouped in particular areas. For each scenario modelled, an even distribution of population was used across the census boundaries. This assumption places people over the entire extent of the census polygon. Thus in the initial analysis of the census polygon in which the CariSal property is located, the number of people "located" inside the CariSal plant boundary is equal, even though no residential buildings occur on the CariSal property (a conservative assumption).

Each onsite release scenario was modelled using 16 sectors corresponding to the 16 compass (wind rose) directions. The total population within each sector was scaled based on the percentage of time throughout the wet season and the percentage of time throughout the dry season in which the wind would blow in the direction of that sector.

For some scenarios, the threshold area of the plume does not extend past the CariSal plant boundary. For these sectors and for these scenarios, the number of offsite residential persons within the sector is considered to be zero and the population analysis was adjusted accordingly.

Figure 3.6-1 shows the population data used in the societal risk analysis. Figure 3.6-2 shows the locations of neighbouring industrial plants. Table 3.6-1 shows employment at neighbouring industrial operations. For this analysis, residences were assumed to be occupied 100 percent of the time. Industrial facilities were assumed to be occupied 50 percent of the time by the normal working hour population and 50 percent of the time by the after-hours population.

Table 3.6-1: Neighbouring Industrial Operations

No.	Facility Name	Facility Activity	Normal Working Hours[a]	Outside Normal Working Hours
1	Atlas Methanol	Methanol	170	15
2	Titan Methanol	Methanol	240	40
3	CNC Ammonia Plant	Ammonia	65	4
4	Tringen	Natural Gas	2	0
5	Yara Trinidad	Ammonia	50	6
6	PPCPL Compound	Fertilizer	12	1
7	IGL	Oxygen, Acetylene	10	1
8	Petrotrin Comp.	Natural Gas	4	2
9	ANSA McAL	Chlorine	75	12
10	National Agro	Fertilizer	75	12
11	Aerogas Ltd	Aerosol Gas	75	12
12	Desalcott	Desalination of sea water	60	10
13	Northern Const.	Concrete and aggregate batch plant	200	5
14	Work Shops	Machine Shops, etc.		
15	Universal Fds	Food	40	10
16	LJ Williams		32	2
17	ESCO		25	3
18	AUM Complex		40	2
19	Caroin Ltd.		40	2

[a] Normal hours are 7 a.m. to 7 p.m., except for the Yara Trinidad Ltd. facility, where people work three shifts from 7 a.m. to 3 p.m., from 3 p.m. to 11 p.m., and 11 p.m. to 7 a.m.

Source: Telephone conversations with neighbouring industrial facilities conducted by Roger Moore in 2007.

Figure 3.6-1: Population Map for the Vicinity of the CariSal Site.

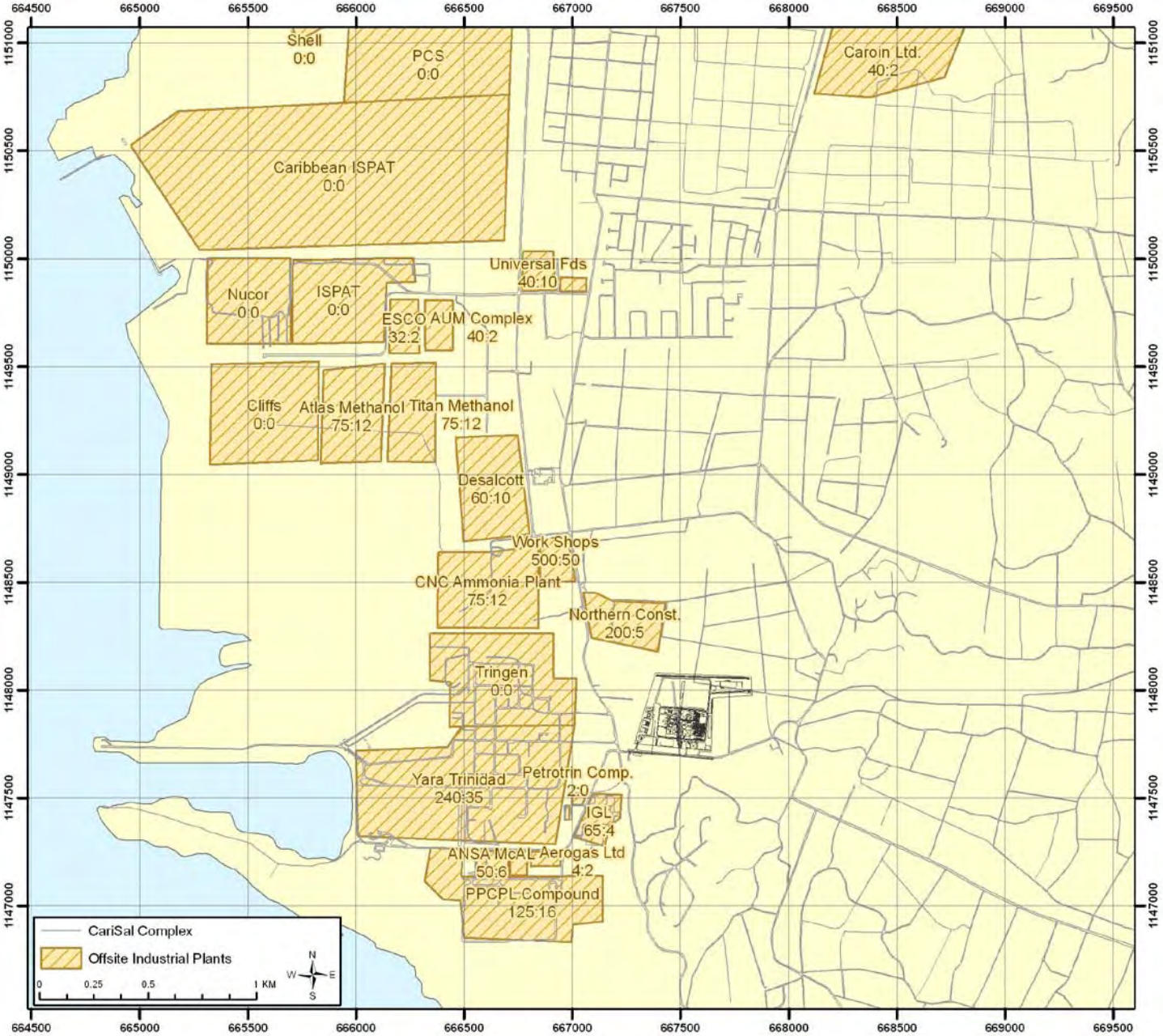


Figure 3.6-2: Locations of Neighbouring Industrial Facilities.

4. ACCIDENT SCENARIO CONSEQUENCE ANALYSIS

The following sections describe the calculations and assumptions used to derive the model source parameters. All the model inputs for the ALOHA® runs are shown in the summary output in Appendix C, and a table of all the model inputs for the SLAB model is shown in Appendix D.

A summary of the modelling assumptions and modelling results for scenarios described in Section 3 above is shown in Appendix A. Modelling assumptions and modelling results for these scenarios are described in this section.

4.1 Chlorine Release Scenarios

The chlorine pipe release scenarios involve both outdoor and indoor releases of chlorine gas due to a breach. In the worst-case scenario, a full breach equal in area to the cross-sectional area of the pipe would occur. Plant emergency shutdown would occur immediately upon detection of a release or detection of a pressure change in the process piping, limiting the expected chlorine release duration to approximately 10 seconds. To account for the fact that it might take some time for the detection system to detect the release (particularly outdoors in the presence of windy conditions), the releases are assumed to be longer than 30 seconds. The worst-case volume of chlorine for modelling purposes contained in the breached process equipment is equivalent to a release rate of approximately 96 pounds (44 kilograms) per minute for 30 seconds plus the initial volume of chlorine contained in the process pipe (55 pounds; 25 kilograms) at the time of the release, for a total release of 103 pounds (47 kilograms) of chlorine (CariSal Unlimited 2008).

4.1.1 Indoor Pipe Breach: Full Breach: Scenario 1.a.1

For the indoor release scenario, the ALOHA® model was used to model the release event. The shortest event duration in the model is 1 minute; thus, the scenario was run as an instantaneous direct release of 47 kilograms to the indoor environment with an air exchange rate of 0.4 exchanges per hour.

For the chemical parameters, the chlorine entry in the ALOHA® database was used.

In addition to this worst-case breach scenario, a second case was also considered. In the second case, a more probable breach to the pipe occurs, which introduces a hole leaving 20 percent of the pipe open. In this case, the release rate and breach area would be only 20 percent of the values in the full breach scenario. Thus, the distance to the threshold concentration of 140 ppm (406 milligrams per cubic metre) is 152 metres, a factor of 0.55 lower than the full breach scenario.

One modelling run was conducted for the indoor pipe breach (full breach) chlorine gas release scenario using the ALOHA® model.

The modelling run shows the "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 milligrams per cubic metre) for a stability class F and wind speed of 0.62 metres per second. Modelling results for this scenario are shown in Figure 4.1.1-1.

As shown, the threshold zone distance for this scenario extends 273 metres from the point of release.

Detailed modelling assumptions and results for the indoor pipe chlorine release scenario are shown in Appendix A.1.1

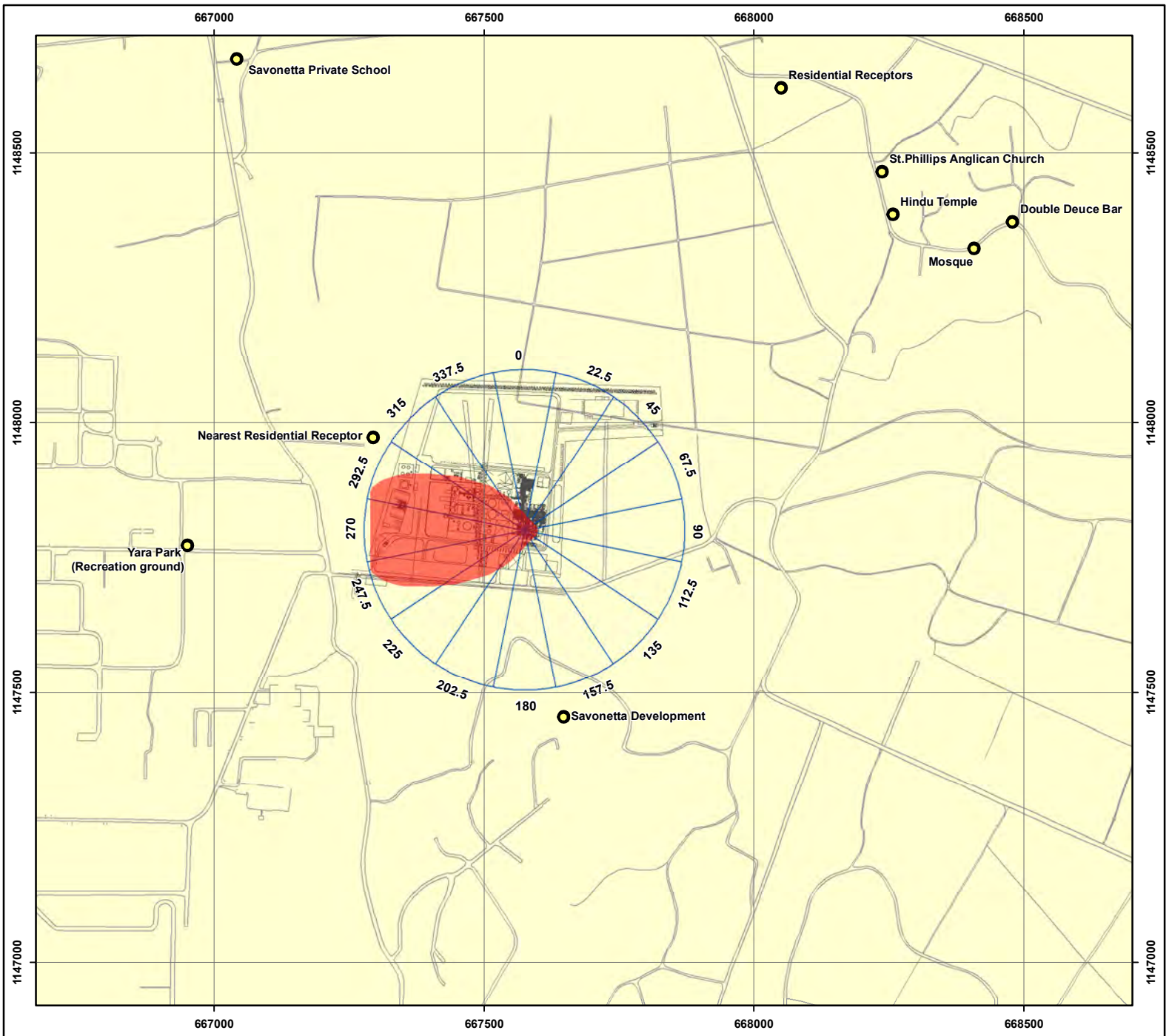


Figure 4.1.1-1. Threat Zone for Chlorine Release Indoors
Scenario 1.a.1: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	2.50	0.00	0.00	0.03	0.00	0.00
22.5	0.87	0.72	2.50	0.00	0.00	0.02	0.00	0.00
45	4.27	3.11	2.50	0.00	0.00	0.09	0.00	0.00
67.5	16.11	16.01	2.50	0.00	0.00	0.40	0.00	0.00
90	33.03	33.37	2.50	0.00	0.00	0.83	0.00	0.00
112.5	31.22	23.13	2.50	0.00	0.00	0.68	0.00	0.00
135	6.13	7.72	2.50	0.00	0.00	0.17	0.00	0.00
157.5	0.82	2.62	2.50	0.00	0.00	0.04	0.00	0.00
180	0.21	1.28	2.50	0.00	0.00	0.02	0.00	0.00
202.5	0.03	0.55	2.50	0.00	0.00	0.01	0.00	0.00
225	0.03	0.34	2.50	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	2.50	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	2.50	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	2.50	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	2.50	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	2.50	0.00	0.00	0.04	0.00	0.00
			Total	0.00	0.00	2.35	0.00	0.00

Community Facility
>= 406 mg/m3
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.125 0.25 0.5 Kilometers

ICF20090107KEW001

4.1.2 Outdoor Pipe Breach: Full Breach: Scenario 1.a.2

For the outdoor release, the contents of the pipe are assumed to exist under pressure. The SLAB users guide indicates that SLAB modelling begins after full adiabatic expansion has occurred; for this reason, the temperature and release area must be adjusted if the contents are under pressure. The source temperature is given by:

$$TS = \left(\frac{1}{\gamma}\right)\left[1 + (\gamma - 1) \times \left(\frac{P_a}{P_{st}}\right)\right] T_{st}$$

where:

TS = adjusted source temperature
γ = ratio of the specific heats
P_a = ambient atmospheric pressure
P_{st} = storage pressure
T_{st} = storage temperature.

Using a storage pressure of 1.23 bar, a storage temperature of 40 °C, ambient pressure of 1 bar, and γ of 1.308 (as in the SLAB user's guide), the storage temperature after adiabatic expansion is 30 °C.

Similarly, the source area must be adjusted using the equation:

$$AS = \frac{P_{st}}{P_a} \frac{TS}{T_{st}} A$$

where:

P_{st} = storage pressure
P_a = ambient atmospheric pressure
TS = adjusted source temperature
T_{st} = storage temperature
A = actual release area.

This calculation increases the effective release radius from 12 inches to 13 inches (30 centimetres to 33 centimetres), for an area of 0.086 square metres.

The source rate is 47 kilograms divided by 30 seconds, or 1.6 kg/s, as detailed above. The model was run as a horizontal jet release.

SLAB provides chlorine-specific chemical inputs in the user's guide, and these parameters were used in the scenario modelling. The 10-minute fatality threshold was used, so the model concentration averaging time was set to 10 minutes.

In addition to this worst-case breach scenario, a second case was also considered. In the second case, a more probable breach to the pipe occurs that introduces a hole leaving 20 percent of the pipe open. In this case, the release rate and breach area would be only 20 percent of the values in the full breach scenario. In this case, the distance to the threshold concentration of 140 ppm (406 mg/m^3) is 60 metres, a factor of 0.29 lower than the full breach scenario.

One model run was conducted for the outdoor pipe breach (full breach) chlorine gas release scenario using the SLAB model.

The modelling run shows the "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 mg/m^3) for an averaging time of 10 minutes, stability class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.1.2-1.

As shown, the threshold zone distance for this scenario extends 208 metres from the point of release.

Detailed modelling assumptions and results for the outdoor pipe chlorine release scenarios are shown in Appendix A.1.2.

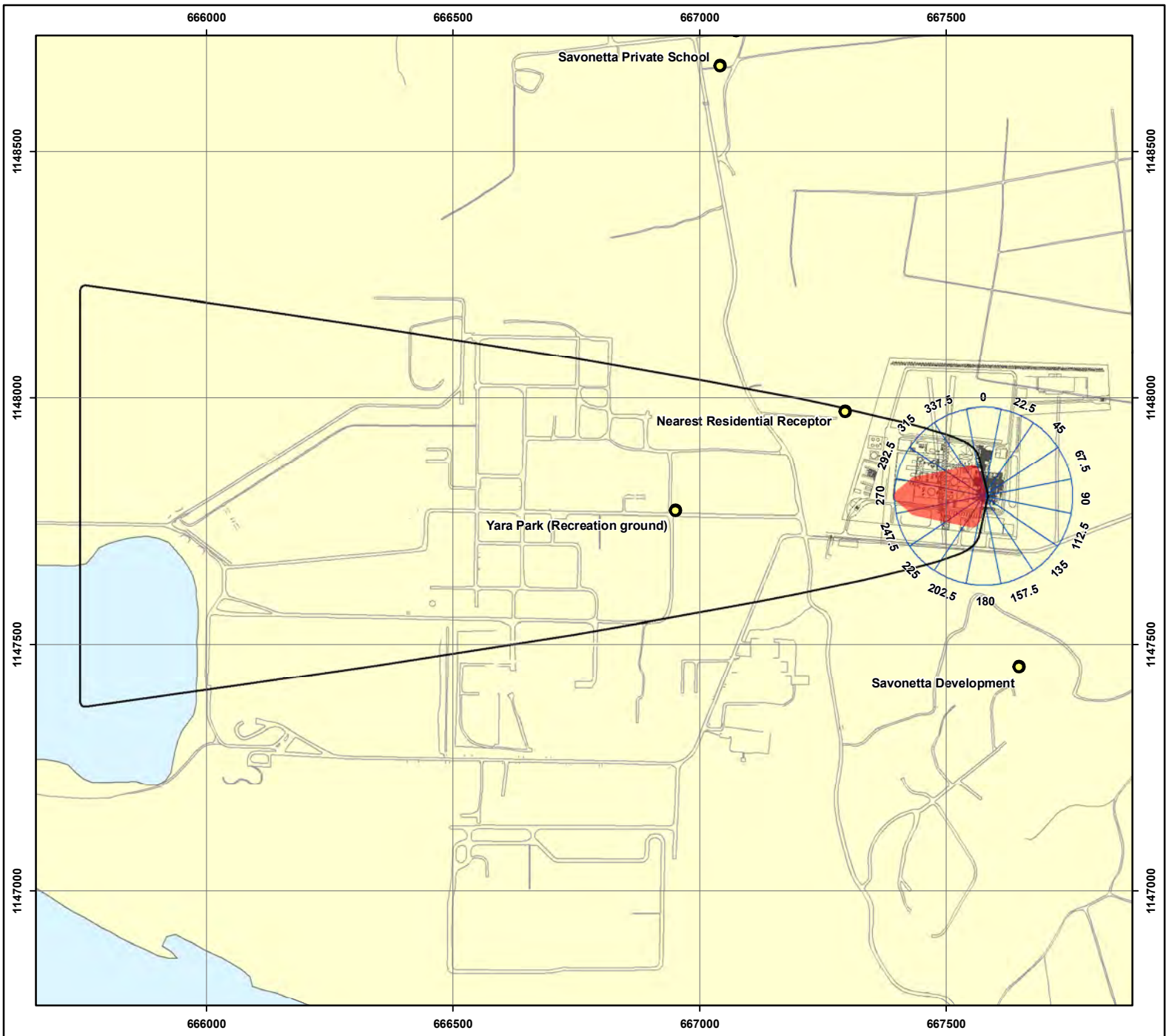


Figure 4.1.2-1. Threat Zone for Chlorine Release Outdoors Scenario 1.a.2: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	0.00	0.00	0.00	0.00	0.00	0.00
22.5	0.87	0.72	0.78	0.00	0.00	0.01	0.00	0.00
45	4.27	3.11	0.78	0.00	0.00	0.03	0.00	0.00
67.5	16.11	16.01	0.78	0.00	0.00	0.12	0.00	0.01
90	33.03	33.37	0.78	0.00	0.00	0.26	0.00	0.03
112.5	31.22	23.13	0.78	0.00	0.00	0.21	0.00	0.02
135	6.13	7.72	0.78	0.00	0.00	0.05	0.00	0.01
157.5	0.82	2.62	0.78	0.00	0.00	0.01	0.00	0.00
180	0.21	1.28	0.78	0.00	0.00	0.01	0.00	0.00
202.5	0.03	0.55	0.78	0.00	0.00	0.00	0.00	0.00
225	0.03	0.34	0.78	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	0.78	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	0.00	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	0.00	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	0.00	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	0.00	0.00	0.00	0.00	0.00	0.00
			Total	0.00	0.00	0.71	0.00	0.07

Community Facility
>= 406 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.125 0.25 0.5 Kilometers

ICF20090107KEW002

4.1.3 Outdoor Pipe Breach: Seismic Event: Scenario 1.a.3

For the seismic event, it is assumed that both process pipes are breached. Thus, the storage temperature is the same as in Scenario 1.a.2, but the source rate and release area are both a factor of 2 higher, giving a release rate of 3.2 kilograms per second and an area of 0.172 square metre. The model was run as a horizontal jet release.

SLAB provides chlorine-specific chemical inputs in the user's guide, and these parameters were used in the scenario modelling. The 10-minute fatality threshold was used, so the model concentration averaging time was set to 10 minutes.

One modelling run was conducted for the outdoor pipe breach (seismic event) chlorine gas release scenario using the SLAB model.

The modelling run shows the "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 mg/m^3) for an averaging time of 10 minutes, stability class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.1.3-1.

As shown, the threshold zone distance for this scenario extends 343 metres from the point of release.

Detailed modelling assumptions and results for the outdoor pipe chlorine release scenarios are shown in Appendix A.1.2.

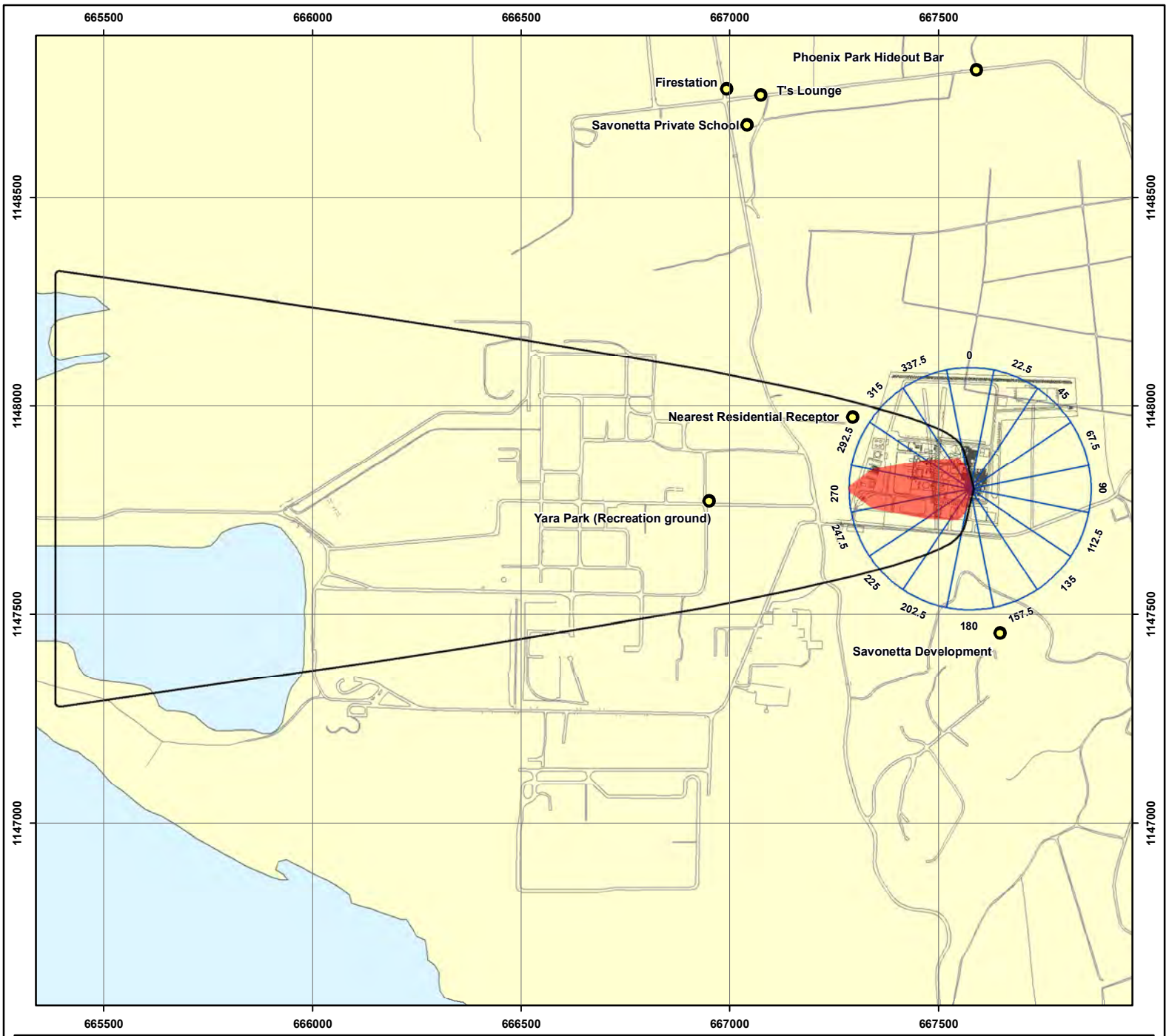


Figure 4.1.3-1. Threat Zone for Chlorine Release Outdoors; Seismic Event Scenario 1.a.3: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	1.56	0.00	0.00	0.02	0.00	0.00
22.5	0.87	0.72	1.56	0.00	0.00	0.01	0.00	0.00
45	4.27	3.11	1.56	0.00	0.00	0.06	0.00	0.01
67.5	16.11	16.01	1.56	0.00	0.00	0.25	0.00	0.03
90	33.03	33.37	1.56	0.00	0.00	0.52	0.00	0.05
112.5	31.22	23.13	1.56	0.00	0.00	0.42	0.00	0.04
135	6.13	7.72	1.56	0.00	0.00	0.11	0.00	0.01
157.5	0.82	2.62	1.56	0.00	0.00	0.03	0.00	0.00
180	0.21	1.28	1.56	0.00	0.00	0.01	0.00	0.00
202.5	0.03	0.55	1.56	0.00	0.00	0.00	0.00	0.00
225	0.03	0.34	1.56	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	1.56	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	1.56	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	1.56	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	0.00	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	0.00	0.00	0.00	0.00	0.00	0.00
			Total	0.00	0.00	1.44	0.00	0.14

Community Facility
>= 406 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.125 0.25 0.5 Kilometers

ICF20090107KEW003

4.1.4 Intermixing Hydrochloric Acid-Sodium Hypochlorite: Scenario 1.b

This scenario would involve the inadvertent loading of 4,000 gallons (15,140 litres) of hypochlorite product into a 4,000-gallon (15,142-litre) tank truck that already contains a 100-gallon (379-litre) "heel" of hydrochloric acid, or the inadvertent loading of 4,000 gallons (15,140 litres) of hydrochloric acid into a 4,000-gallon (15,142-litre) tank truck that already contains a 100-gallon (379-litre) "heel" of hypochlorite. The hypochlorite product contains approximately 12-percent chlorine, and either scenario would result in a release of 120 pounds (54 kilograms) of chlorine gas from the reaction of hypochlorite with the hydrochloric acid over the course of approximately 3 minutes, giving an estimated release rate of 0.3 kilogram per second.

The chlorine gas release would occur from the tank truck valve at an assumed release height of 4 metres. The truck valve is 2 inches (5 centimetres) in diameter, giving a release area of 0.002 square metres at ambient (26.6 °C) temperature. The contents are not stored under pressure, so no correction is made for adiabatic expansion.

SLAB provides chlorine-specific chemical inputs in the user's guide, and these parameters were used in the scenario modelling. The 10-minute fatality threshold was used, so the model concentration averaging time was set to 10 minutes.

One modelling run was conducted for the intermixing hydrochloric acid-sodium hypochlorite chlorine gas release scenario using the SLAB model.

The modelling run shows the "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 mg/m^3) for an averaging time of 10 minutes, stability class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.1.4-1.

As shown, the threshold zone distance for this scenario extends 181 metres from the point of release.

Detailed modelling assumptions and results for the intermixing hydrochloric acid-sodium hypochlorite chlorine release scenarios are shown in Appendix A.1.3.

Figure 4.1.4-1. Threat Zone for Intermixing of Hypochlorite with HCl
Scenario 1.b: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	0.83	0.00	0.00	0.01	0.00	0.00
22.5	0.87	0.72	0.83	0.00	0.00	0.01	0.00	0.00
45	4.27	3.11	0.00	0.00	0.00	0.00	0.00	0.00
67.5	16.11	16.01	0.00	0.00	0.00	0.00	0.00	0.00
90	33.03	33.37	0.00	0.00	0.00	0.00	0.00	0.00
112.5	31.22	23.13	0.00	0.00	0.00	0.00	0.00	0.00
135	6.13	7.72	0.00	0.00	0.00	0.00	0.00	0.00
157.5	0.82	2.62	0.83	0.00	0.00	0.01	0.00	0.00
180	0.21	1.28	0.83	0.00	0.00	0.01	0.00	0.00
202.5	0.03	0.55	0.83	0.00	0.00	0.00	0.00	0.00
225	0.03	0.34	0.83	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	0.83	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	0.83	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	0.83	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	0.83	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	0.83	0.00	0.00	0.01	0.00	0.00
			Total	0.00	0.00	0.06	0.00	0.01

Community Facility
>= 406 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.125 0.25 0.5 Kilometers

ICF20090107KEW004

4.2 Hydrochloric Acid Release Scenarios

4.2.1 Vessel Failure: Onsite Hydrochloric Acid Storage Tank: Scenario 2.b

An accidental release of liquid HCl could occur from vessel failure of the onsite hydrochloric acid storage tank, resulting in a maximum 400,000-gallon (1,514,160-litre) release. For this scenario, it is assumed that a 12-inch (30-centimetre) breach in the tank causes the tank to empty at a rate of approximately 1,215 kilograms per second, resulting in a total release of the tank contents over 24 minutes. This release would involve the 36-percent HCl product. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would fill the secondary containment system and that HCl emissions would result from the devolution of HCl vapour from the secondary containment system. The surface area of the secondary containment system is approximately 911 square metres.

SLAB does not estimate evaporation rates from liquid releases. However, ALOHA® does incorporate chemical parameters, spill areas, and meteorological conditions to estimate time varying evaporation rates in units of kilograms per second. Thus, ALOHA® was run as a puddle release assuming a pool area of 911 square metres, a puddle volume of 400,000 gallons (1,514,160 litres), a ground temperature of 26.6 °C, and a concrete ground type. The hydrochloric acid 36-percent solution chemical parameters from the ALOHA® database were used to set the chemical parameters. ALOHA® estimated that hydrochloric acid release would continue past the maximum 1-hour evaluation period in the model. The total mass of chemical released (1,789 kilograms) was divided by 1 hour to give an average release rate of 0.5 kilograms per second. The full ALOHA® outputs are shown in Appendix C.

This release rate was then input into the SLAB model. SLAB does not provide chemical-specific parameters for HCl. Thus, the values from the ALOHA® database were used for all overlapping input requirements, and the remaining necessary values (liquid density, latent heat of vaporization, and heat capacity) were taken from Air Liquide Gas Encyclopaedia (http://encyclopedia. airliquide.com). The full list of chemical parameters is shown in Appendix D.

The SLAB release duration was set to 1 hour, which assumes that the response time to mediate the spill is 1 hour. Because the release lasts substantially longer than 10 minutes, the 30-minute fatality threshold was used, and the model concentration averaging time was set to 30 minutes. The model was run as an evaporative pool release.

One modelling run was conducted for the hydrochloric acid storage tank release scenario using the SLAB model and the ALOHA® model. The ALOHA® model was used to estimate the rate of vapour release from the liquid spill and the SLAB model was used to model the dispersion of the vapour released.

The modelling run shows the “threshold zone” based on the zone of the plume of hydrochloric acid within which the concentration of hydrochloric acid would reach or exceed a concentration of 4,000 ppm (5,965 milligrams per cubic metre) for an averaging time of 30 minutes, stability

class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.2.1-1. As shown, the threshold zone distance for this scenario extends 122 metres from the point of release.

Detailed modelling assumptions and results for the hydrochloric acid release scenario are shown in Appendix A.2.1.

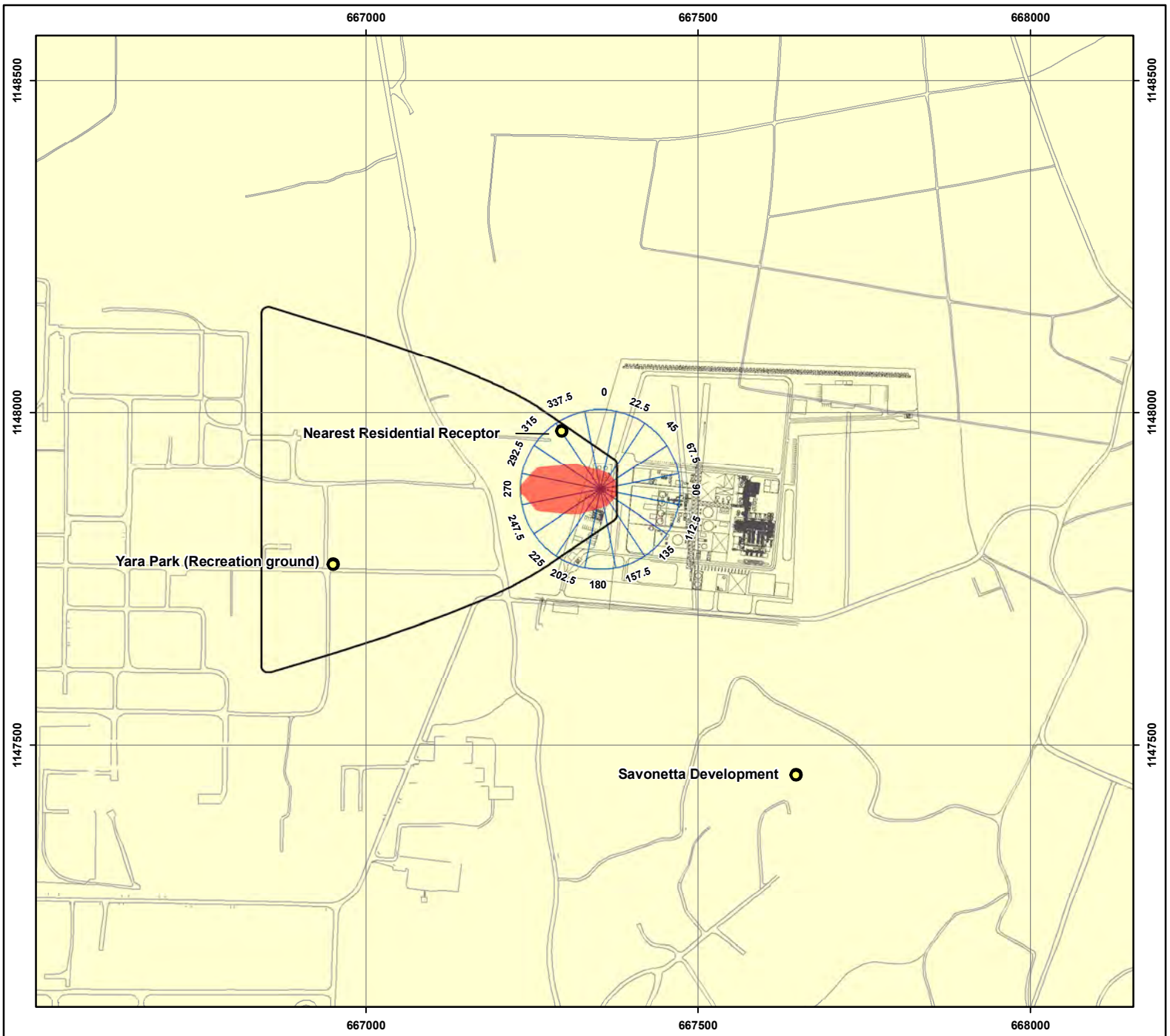


Figure 4.2.1-1. Threat Zone for Vessel Failure: Onsite HCl Storage Tank Scenario 2.b: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	0.41	0.00	0.00	0.00	0.00	0.00
22.5	0.87	0.72	0.00	0.00	0.00	0.00	0.00	0.00
45	4.27	3.11	0.00	0.00	0.00	0.00	0.00	0.00
67.5	16.11	16.01	0.00	0.00	0.00	0.00	0.00	0.00
90	33.03	33.37	0.00	0.00	0.00	0.00	0.00	0.00
112.5	31.22	23.13	0.00	0.00	0.00	0.00	0.00	0.00
135	6.13	7.72	0.00	0.00	0.00	0.00	0.00	0.00
157.5	0.82	2.62	0.00	0.00	0.00	0.00	0.00	0.00
180	0.21	1.28	0.00	0.00	0.00	0.00	0.00	0.00
202.5	0.03	0.55	0.41	0.00	0.00	0.00	0.00	0.00
225	0.03	0.34	0.41	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	0.41	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	0.41	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	0.41	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	0.41	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	0.41	0.00	0.00	0.01	0.00	0.00
			Total	0.00	0.00	0.02	0.00	0.00

Community Facility
>= 5,965 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.1 0.2 0.4 Kilometers

ICF20090107KEW005

4.2.2 Offsite Hydrochloric Acid Tank Truck Accident: Scenario 6.a

Hydrochloric acid would be transported to local customers using 4,000-gallon (15,142-litre) tank trucks travelling on public roads. An accidental release could result from an offsite transportation accident, potentially involving another vehicle. A release resulting from a transportation accident would be assumed to involve damage to the 2-inch (5-centimetre) diameter truck fill pipe and subsequent release of 50 percent of the volume of the tank truck. The 2,000-gallon (7,570-litre) release would occur over a period of approximately 8 minutes and would be assumed to be uncontained. For this scenario, it is assumed that the hydrochloric acid release occurs over a paved area (e.g., a roadway) and that the liquid release remains in the paved area until it is neutralized by emergency responders. The uncontained area is estimated assuming a 1-centimetre pool depth and the density of the solution (1,177 kilograms per cubic metre), yielding an area of 758 square metres. The spread of the liquid release is assumed to be constrained due to the assumed presence of roadway structures (e.g., curbs, shoulders, drainage, slope). The area of confinement is taken as 30 percent of the area of a totally unconstrained spill, resulting in an approximate surface area of the liquid release of 227 square metres.

As in the onsite truck scenario, ALOHA® was used to estimate the evaporation rate from the pool. The total mass released was 364 kilograms over a 1-hour time scale, yielding an average evaporation rate of 0.1 kilograms per second.

The SLAB release duration was set to 1 hour, which assumes that the response time to mediate the spill is 1 hour. Because the release lasts substantially longer than 10 minutes, the 30-minute fatality threshold was used, and the model concentration averaging time was set to 30 minutes. The model was run as an evaporative pool release.

One modelling run was conducted for the hydrochloric acid tank truck release scenario using the SLAB model and the ALOHA® model. The ALOHA® model was used to estimate the rate of vapour release from the liquid spill and the SLAB model was used to model the dispersion of the vapour released.

The modelling run shows the “threshold zone” based on the zone of the plume of hydrochloric acid within which the concentration of hydrochloric acid would reach or exceed a concentration of 4,000 ppm (5,965 milligrams per cubic metre) for an averaging time of 30 minutes, stability class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.2.2-1.

As shown, the threshold zone distance for this scenario extends 44 metres from the point of release.

Detailed modelling assumptions and results for the hydrochloric acid release scenario are shown in Appendix A.2.2.

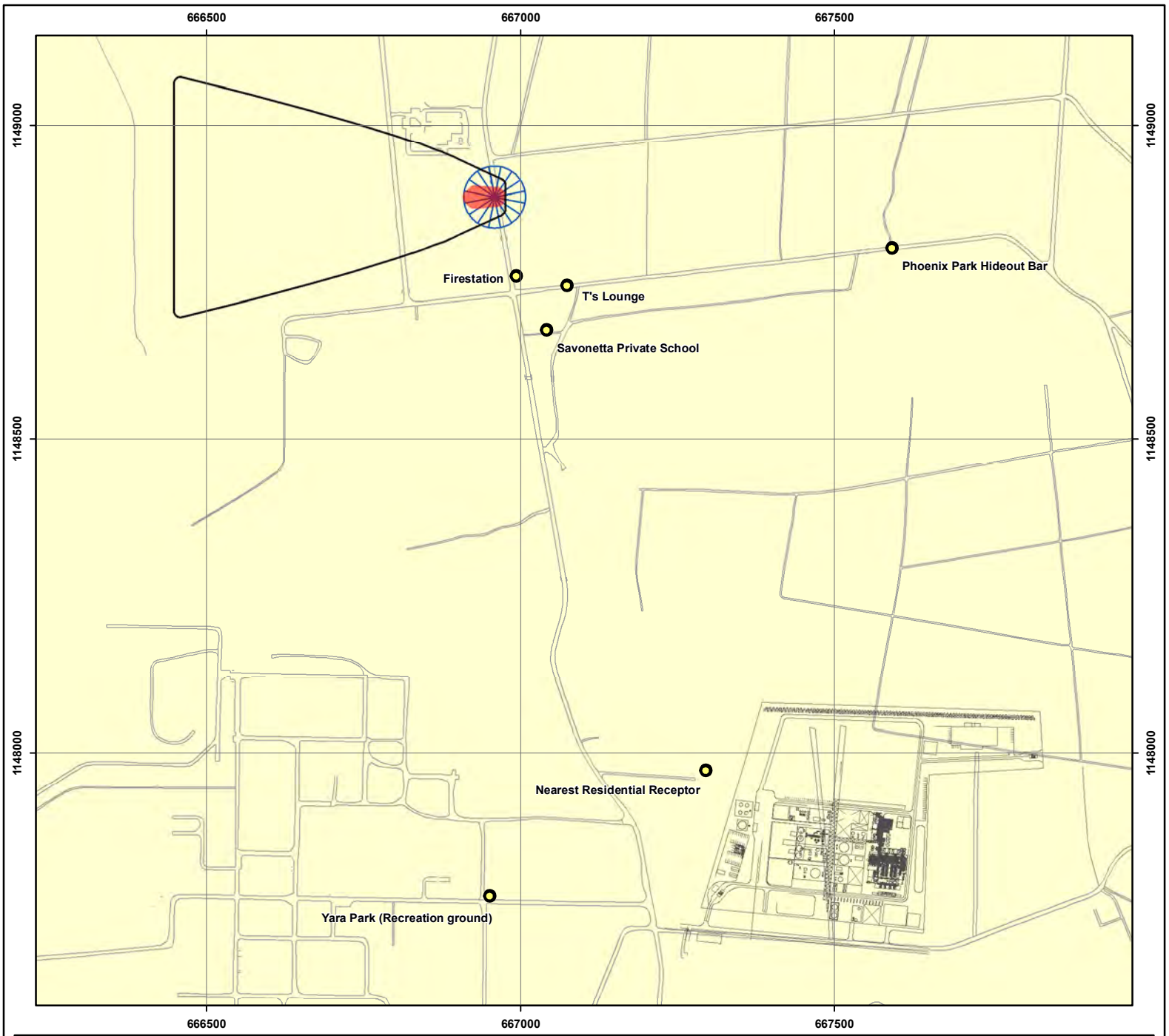


Figure 4.2.2-1. Threat Zone for Offsite Hypochloric Acid Spill from 4,000 Gallon Tank Truck Accident on Public Road (Scenario 6.a: Wet/Dry Season IDLH Threshold)

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	3.02	0.00	0.00	0.03	0.00	0.00
22.5	0.87	0.72	3.02	0.00	0.00	0.02	0.00	0.00
45	4.27	3.11	3.02	0.00	0.00	0.11	0.00	0.01
67.5	16.11	16.01	3.02	0.00	0.00	0.49	0.00	0.05
90	33.03	33.37	3.02	0.00	0.00	1.00	0.00	0.10
112.5	31.22	23.13	3.02	0.00	0.00	0.82	0.00	0.08
135	6.13	7.72	3.02	0.00	0.00	0.21	0.00	0.02
157.5	0.82	2.62	3.02	0.00	0.00	0.05	0.00	0.01
180	0.21	1.28	2.93	0.00	0.00	0.02	0.00	0.00
202.5	0.03	0.55	2.33	0.00	0.00	0.01	0.00	0.00
225	0.03	0.34	1.86	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	1.65	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	1.64	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	1.83	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	2.27	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	2.89	0.00	0.00	0.04	0.00	0.00
			Total	0.00	0.00	2.83	0.00	0.27

Community Facility
>= 5,965mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.1 0.2 0.4 Kilometers

ICF20090107KEW009

4.3 Sodium Hypochlorite Release Scenarios

4.3.1 Vessel Failure: Onsite Sodium Hypochlorite Storage Tank: Scenario 2.c

An accidental release of liquid hypochlorite could occur from vessel failure of one of the four onsite hypochlorite acid storage tank, resulting in a maximum 45,000-gallon (170,340-litre) release. For this scenario, it is assumed that a breach in the tank causes the tank to empty at a rate of approximately 737 kilograms per second, resulting in a total release of the tank contents over a 19-minute period. This release would involve the 12-percent hypochlorite product. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would fill the secondary containment system, and that emissions would result from the devolution of chlorine gas from the secondary containment system. The surface area of the secondary containment system is approximately 426 square metres.

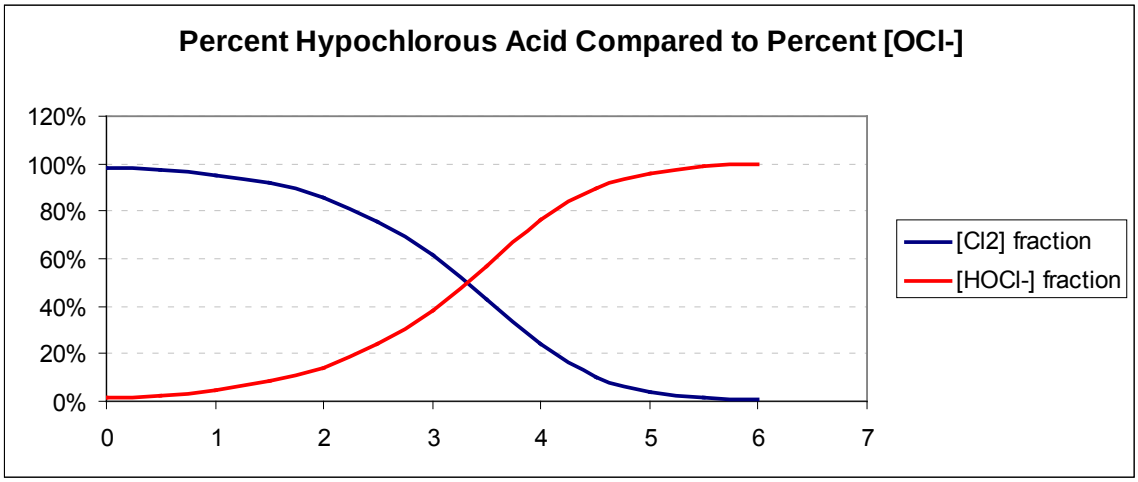
The vapour over a 12-percent sodium hypochlorite solution will contain hypochlorous acid at high pH values, but chlorine gas can be released if the pH is lowered (Lee and Lin 2007). Sodium hypochlorite solutions are stored at pH values between 11 and 12 to slow down decomposition (The Chlorine Institute 2006), so a likely release would involve limited releases of hypochlorous acid. However, chlorine releases will tend to pose a larger public health threat, so the worst-case scenario spill would be an event which leads to a lowered spill pH and a release of chlorine. A scenario where the spill came in contact with a strong acid, such as through human error during spill clean up, might lower the pH to this level. It would be unlikely that this would happen.

To quantify the release rate of either hypochlorous acid or chlorine at a given pH, the following two equilibrium reactions can be used (Lee and Lin 2007):

$$OCl^- + H^+ \longleftrightarrow HOCl$$

$$H^+ + Cl^- + HOCl \longleftrightarrow H_2O + Cl_2$$

Using the original molarity of the NaOCl solution and equilibrium constants of 3.7 x 10^{-8} and 4.48 x 10^{-4} for the reactions, respectively, one can determine the concentration of [HOCl], [OCl-], and [Cl_2] at any pH. Lee and Lin (2007) show a graph of the relative fraction of each species at a given pH and indicate that the species consists entirely of HOCl and aqueous Cl_2 at a pH of approximately 6.5. The following graph indicates the relative fractions of the two species using the equilibrium constant for the temperature of the release scenario:



The total available molarity of the 12-percent solution is 1.9 molar (M). Thus, the concentration of Cl_2 and OCl^- can be calculated for any pH using the relative fraction from the graph. For the purposes of accident release modelling, a pH of 5.5 was selected. This pH corresponds to the pH of rainwater and represents a possible pH of the spill due to inadvertent pH effects from the mitigation efforts or from natural phenomena. At a pH of 5.5, $[Cl_2]$ is 2.4 x 10^{-2} M and [HOCl] is 1.84 M.

Once the concentrations are known, Henry's Law can be used to estimate the partial vapour pressure of each species using the Henry's Law constant. For chlorine gas, the Henry's Law constant is 9.5 x 10^{-2} M/atm (Lide and Frederikse 1995) and for HOCl the Henry's Law constant is 2.60 x 10^{2} M/atm (Wagman et. al. 1982). At a pH of 5.5, then, the partial vapour pressure of HOCl is 5.4 mm Hg. According to the U.S. EPA Guidance Document on accidental release modelling (USEPA 1999), toxic substances may be excluded from accidental release modelling if the partial vapour pressure of the toxic substance is below 10 millimetres of mercury (mm Hg). Thus, even when nearly all the available chlorine exists as HOCl in solution, the vapour pressure is low and an accidental hypochlorous acid release would result in limited health consequences.

The vapour pressure of Cl_2 gas at pH 5.5, however, is 191 mm Hg or 25.5 kilopascals (kPa). The Dow Chemical Company Chemical Exposure Index (The Dow Chemical Company 1998) provides an equation for estimating the evaporation rate of a substance from a liquid spill:

$$AQ = 9.0 \times 10^{-4} \left(A_p\right)^{0.95} \left(\frac{MW\ P_v}{T + 273}\right)$$

where:

AQ = airborne quantity release rate in kg/s
Ap = pool area in m2
MW = molecular weight of the substance
Pv = vapour pressure of the substance in kPa
T = characteristic pool temperature in °C.

At pH 5.5, a temperature of 26.6 °C, and a pool area of 426 square metres, this equation yields a Cl_2 release rate of 1.7 kilograms per second. Based on the molarity of the aqueous Cl_2 and the volume of the spill, the entire mass of aqueous Cl_2 would be emitted after 169 seconds.

SLAB was then run using a pool area of 426 square metres, a mass source rate of 1.7 kilograms per second, and a duration of 169 seconds. The concentrations are compared to the 10-minute fatality threshold, so the concentration averaging time was set to 10 minutes. In SLAB, the boiling point was left equal to the boiling point of chlorine gas rather than aqueous chlorine in solution; however, because the spill type is an evaporating pool release, this parameter is not used by the model.

Three modelling runs were conducted for the hypochlorite storage tank release scenario using the SLAB model.

The first modelling run shows the "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 milligrams per cubic metre) for an averaging time of 10 minutes, stability class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.3.1-1. As shown, the threshold zone distance for this scenario extends 520 metres from the point of release.

To determine the sensitivity of the modelling results to the meteorological conditions, two additional cases were run. In one case, the 5th percentile wind was substituted with a more typical wind speed of 1.5 metres per second and the stability class was kept at F. In this case, the "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 milligrams per cubic metre) for an averaging time of 10 minutes. Modelling results for this scenario are shown in Figure 4.3.1-2. As shown, the threshold zone distance for this scenario extends 486 metres from the point of release.

The third modelling run kept the winds at the 5th percentile value but implemented a stability class of C. The "threshold zone" based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 milligrams per cubic metre) for an averaging time of 10 minutes, stability class C, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.3.1-3. As shown, the threshold zone distance for this scenario extends 284 metres from the point of release.

As shown, the highest distance to threshold is from the case for stability class F and wind speed 0.6 metres per second. Therefore, this case was used to model the other scenarios for the societal risk analysis. Detailed modelling assumptions and results for the hydrochloric acid release scenario are shown in Appendix A.3.1.

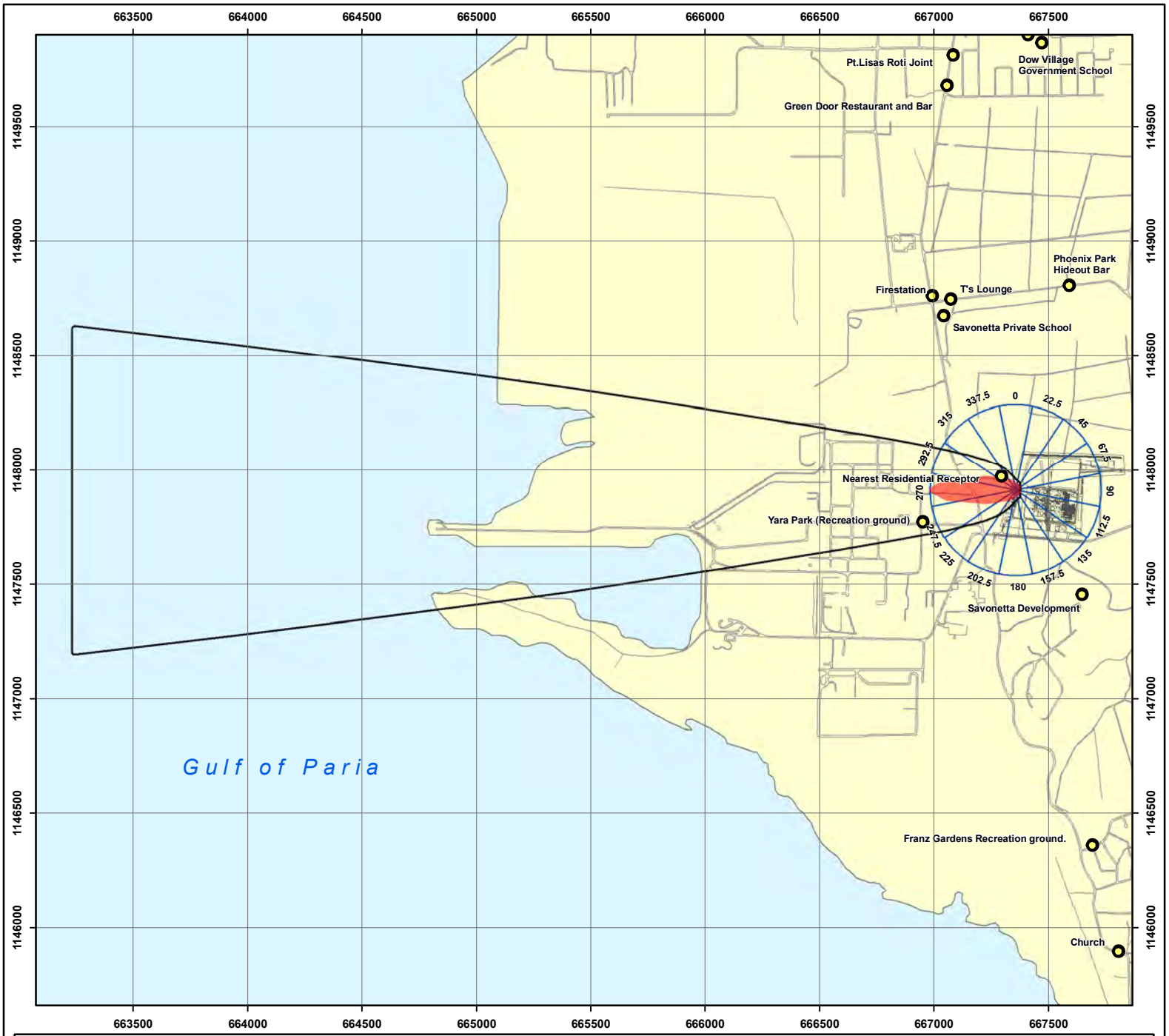


Figure 4.3.1-1. Threat Zone for Vessel Failure: Onsite Hypochlorite Storage Tank Scenario 2.c met 1: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	1.72	16.17	0.40	0.02	0.09	0.00
22.5	0.87	0.72	1.72	0.00	0.00	0.01	0.00	0.00
45	4.27	3.11	1.72	0.00	0.00	0.06	0.00	0.00
67.5	16.11	16.01	1.72	0.00	0.00	0.28	0.00	0.00
90	33.03	33.37	1.72	0.00	0.00	0.57	0.00	0.00
112.5	31.22	23.13	1.72	0.00	0.00	0.47	0.00	0.00
135	6.13	7.72	1.72	0.00	0.00	0.12	0.00	0.00
157.5	0.82	2.62	1.72	0.00	0.00	0.03	0.00	0.00
180	0.21	1.28	1.72	0.00	0.00	0.01	0.00	0.00
202.5	0.03	0.55	1.72	0.00	0.00	0.00	0.00	0.00
225	0.03	0.34	1.72	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	1.72	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	1.72	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	1.72	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	1.72	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	1.72	5.44	0.14	0.03	0.04	0.00
			Total	21.61	0.54	1.61	0.14	0.00

Community Facility
>= 406 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.25 0.5 1 Kilometers

ICF20090107KEW006

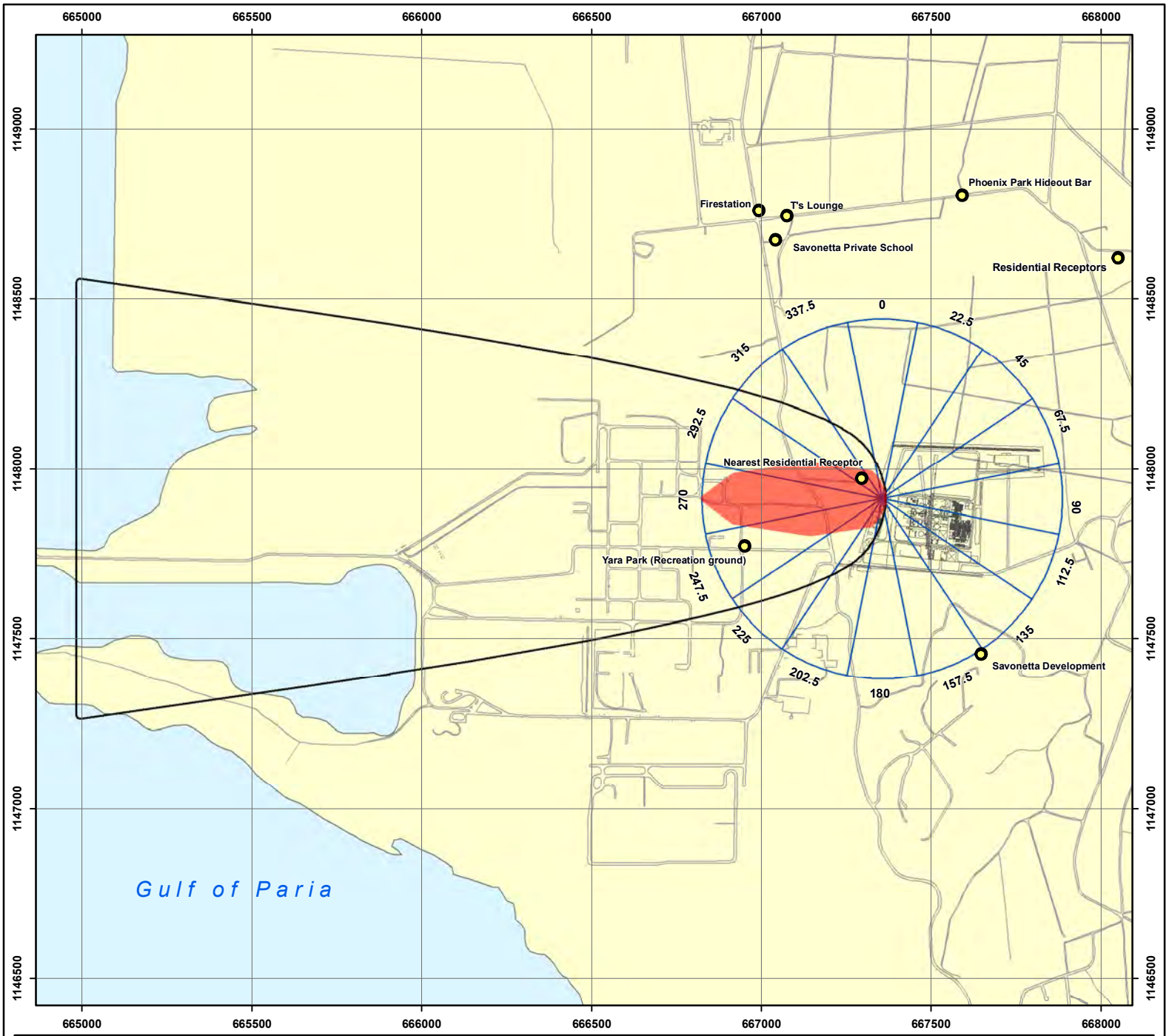


Figure 4.3.1-2. Threat Zone for Vessel Failure: Onsite Hypochlorite Storage Tank Scenario 2.c met 2: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	4.31	77.33	1.93	0.05	0.45	0.00
22.5	0.87	0.72	4.31	4.31	0.11	0.03	0.02	0.00
45	4.27	3.11	4.31	0.00	0.00	0.16	0.00	0.00
67.5	16.11	16.01	4.31	0.00	0.00	0.69	0.00	0.00
90	33.03	33.37	4.31	0.00	0.00	1.43	0.00	0.00
112.5	31.22	23.13	4.31	0.00	0.00	1.17	0.00	0.00
135	6.13	7.72	4.31	0.00	0.00	0.30	0.00	0.00
157.5	0.82	2.62	4.31	0.00	0.00	0.07	0.00	0.00
180	0.21	1.28	4.31	0.00	0.00	0.03	0.00	0.00
202.5	0.03	0.55	4.31	14.12	0.87	0.01	0.02	0.00
225	0.03	0.34	4.31	0.00	0.00	0.01	0.00	0.00
247.5	0.02	0.31	4.31	7.75	1.13	0.01	0.01	0.00
270	0.06	0.25	4.31	0.35	0.05	0.01	0.00	0.00
292.5	0.07	0.16	4.31	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	4.31	3.53	0.09	0.01	0.00	0.00
337.5	1.73	1.36	4.31	71.67	1.79	0.07	0.57	0.00
			Total	179.05	5.97	4.05	1.07	0.00

Community Facility
>= 406 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.15 0.3 0.6 Kilometers

ICF20090107KEW007

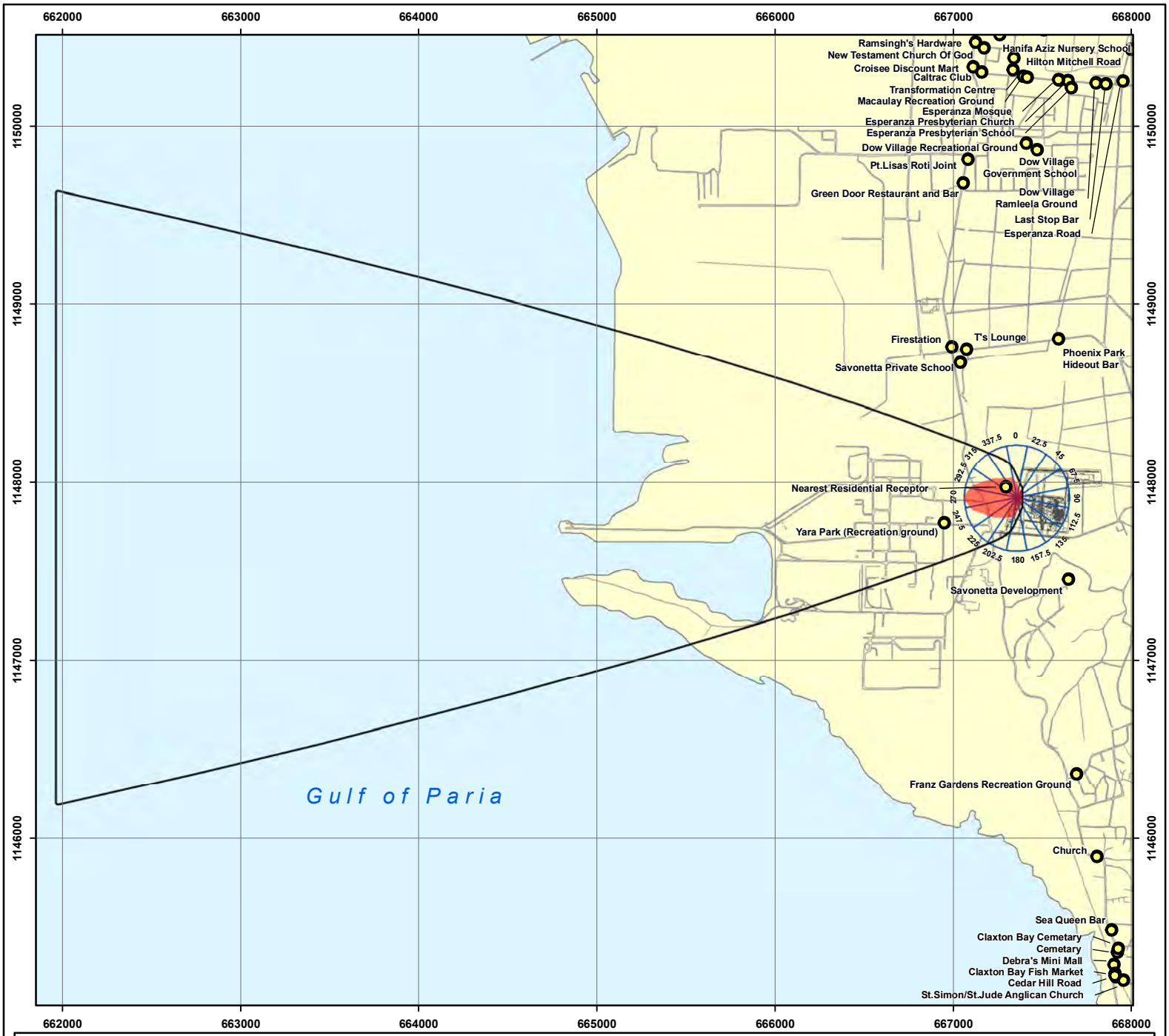


Figure 4.3.1-3. Threat Zone for Vessel Failure: Onsite Hypochlorite Storage Tank Scenario 2.c met 3: Wet/Dry Season IDLH Threshold

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	2.58	1.67	0.04	0.03	0.01	0.00
22.5	0.87	0.72	2.58	0.00	0.00	0.02	0.00	0.00
45	4.27	3.11	2.58	0.00	0.00	0.10	0.00	0.00
67.5	16.11	16.01	2.58	0.00	0.00	0.41	0.00	0.00
90	33.03	33.37	2.58	0.00	0.00	0.86	0.00	0.00
112.5	31.22	23.13	2.58	0.00	0.00	0.70	0.00	0.00
135	6.13	7.72	2.58	0.00	0.00	0.18	0.00	0.00
157.5	0.82	2.62	2.58	0.00	0.00	0.04	0.00	0.00
180	0.21	1.28	2.58	0.00	0.00	0.02	0.00	0.00
202.5	0.03	0.55	2.58	0.00	0.00	0.01	0.00	0.00
225	0.03	0.34	2.58	0.00	0.00	0.00	0.00	0.00
247.5	0.02	0.31	2.58	0.00	0.00	0.00	0.00	0.00
270	0.06	0.25	2.58	0.00	0.00	0.00	0.00	0.00
292.5	0.07	0.16	2.58	0.00	0.00	0.00	0.00	0.00
315	0.13	0.12	2.58	0.00	0.00	0.00	0.00	0.00
337.5	1.73	1.36	2.58	0.00	0.00	0.04	0.00	0.00
			Total	1.67	0.04	2.43	0.01	0.00

Community Facility

>= 406 mg/m3

Confidence Line

Wind Rose

N W E S

Coordinate System: WGS84, UTM Zone 20 North

0 0.25 0.5 1 Kilometers

ICF20090107KEW008

4.3.2 Offsite Sodium Hypochlorite Tank Truck Accident: Scenario 6.b

Hypochlorite would be transported to local customers using 4,000-gallon (15,142-litre) tank trucks travelling on public roads. An accidental release could result from an offsite transportation accident, potentially involving another vehicle. A release resulting from a transportation accident would be assumed to involve damage to the 2-inch (5-centimetre) diameter truck fill pipe and subsequent release of 50 percent of the volume of the tank truck. The 2,000-gallon (7,570-litre) hypochlorite release is assumed to occur over a paved area (e.g., a roadway) and the liquid release remains in the paved area until it is neutralized by emergency responders. The uncontained area is estimated assuming a 1-centimetre pool depth and the density of the solution (1,159 kilograms per cubic metre), yielding an area of 769 metres. The spread of the liquid release is assumed to be constrained due to the assumed presence of roadway structures (e.g., curbs, shoulders, drainage, slope). The area of confinement is taken as 30% of the area of a totally unconstrained spill, resulting in an approximate surface area of the liquid release of 231 square metres.

The same calculations performed for Scenario 2.c also apply for this liquid pool release. At an assumed pH of 5.5, the vapour pressure of hypochlorous acid would also be 5.4 mm Hg, below the EPA guidance threshold. The chlorine gas vapour pressure would remain 191 mm Hg and the release rate for a pool area of 231 square metres would be 1.0 kilogram per second. Based on the molarity of the solution and the volume of the pool, the pool would release the available aqueous chlorine within 30 seconds. Thus, in SLAB, the mass source rate is set to 1.0 kilogram per second for 30 seconds. This release time is much shorter than the release time for the analogous hydrochloric acid spill. This fact reflects the relatively small amount of aqueous chlorine and the relatively high evaporation rate of chlorine compared with the 36-percent HCl solution. The scenario is executed in SLAB assuming an evaporative pool release type, and the concentration averaging time is set to 10 minutes to match the fatality threshold used.

One modelling run was conducted for the hypochlorite tank truck release scenario using the SLAB model.

The modelling run shows the “threshold zone” based on the zone of the plume of chlorine gas within which the concentration of chlorine would reach or exceed a concentration of 140 ppm (406 milligrams per cubic metre) for an averaging time of 10 minutes, stability class F, and wind speed of 0.6 metres per second. Modelling results for this scenario are shown in Figure 4.3.2-1.

As shown, the threshold zone distance for this scenario extends 145 metres from the point of release.

Detailed modelling assumptions and results for the hydrochloric acid release scenario are shown in Appendix A.3.2.

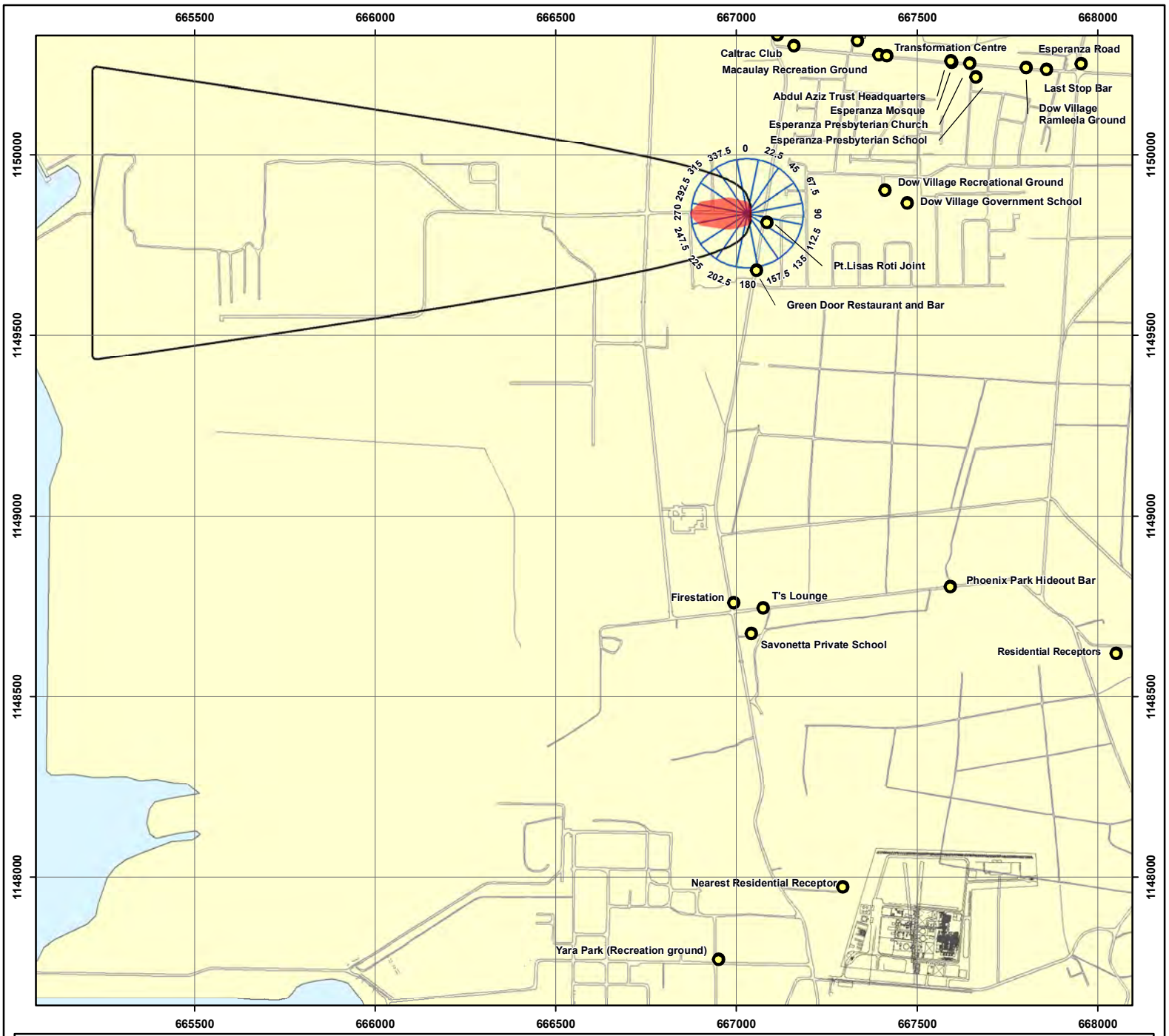


Figure 4.3.2-1. Threat Zone for Offsite Hypochlorite Spill from 4,000 Gallon Tank Truck Accident on Public Road (Scenario 6.b: Wet/Dry Season IDLH Threshold)

Intersection of Threat Zone with Census 2000 & Industrial Population								
Sector	% Dry	% Wet	Census Pop.	Ind. Pop. Day	Ind. Pop. After	Total Census	Total Ind.	Fatality
0	1.17	1.11	19.50	15.47	1.86	0.22	0.10	0.00
22.5	0.87	0.72	19.00	12.04	1.44	0.15	0.05	0.00
45	4.27	3.11	18.66	8.87	1.06	0.69	0.18	0.00
67.5	16.11	16.01	18.53	5.31	0.64	2.98	0.48	0.00
90	33.03	33.37	18.49	3.05	0.37	6.14	0.57	0.00
112.5	31.22	23.13	18.50	1.73	0.21	5.03	0.26	0.00
135	6.13	7.72	18.55	0.82	0.10	1.28	0.03	0.00
157.5	0.82	2.62	18.70	0.17	0.02	0.32	0.00	0.00
180	0.21	1.28	19.11	0.00	0.00	0.14	0.00	0.00
202.5	0.03	0.55	19.54	0.10	0.01	0.06	0.00	0.00
225	0.03	0.34	19.63	0.72	0.09	0.04	0.00	0.00
247.5	0.02	0.31	16.81	2.59	0.31	0.03	0.00	0.00
270	0.06	0.25	15.33	7.96	1.04	0.02	0.01	0.00
292.5	0.07	0.16	16.35	16.15	2.26	0.02	0.01	0.00
315	0.13	0.12	19.65	18.90	2.28	0.02	0.01	0.00
337.5	1.73	1.36	19.63	17.42	2.09	0.30	0.15	0.00
			Total	111.30	13.78	17.44	1.86	0.00

Community Facility
>= 406 mg/m3
Confidence Line
Wind Rose

N
W E
S

Coordinate System:
WGS84, UTM Zone 20 North

0 0.15 0.3 0.6 Kilometers

ICF20090107KEW010

4.4 Offsite Natural Gas Release Scenario: Scenario 4.b

The offsite natural gas release and deflagration scenario was modelled using the ALOHA® model. The threat modelled was overpressure (blast force) from vapour cloud explosion, ignited by detonation. The 0.65 cubic metres of natural gas are released at a pressure of 340 to 360 psig (24.5 to 26 bar) over the course of 1 minute and ignite immediately upon release.

Levels of concern for overpressure (blast force) from vapour cloud explosion were:

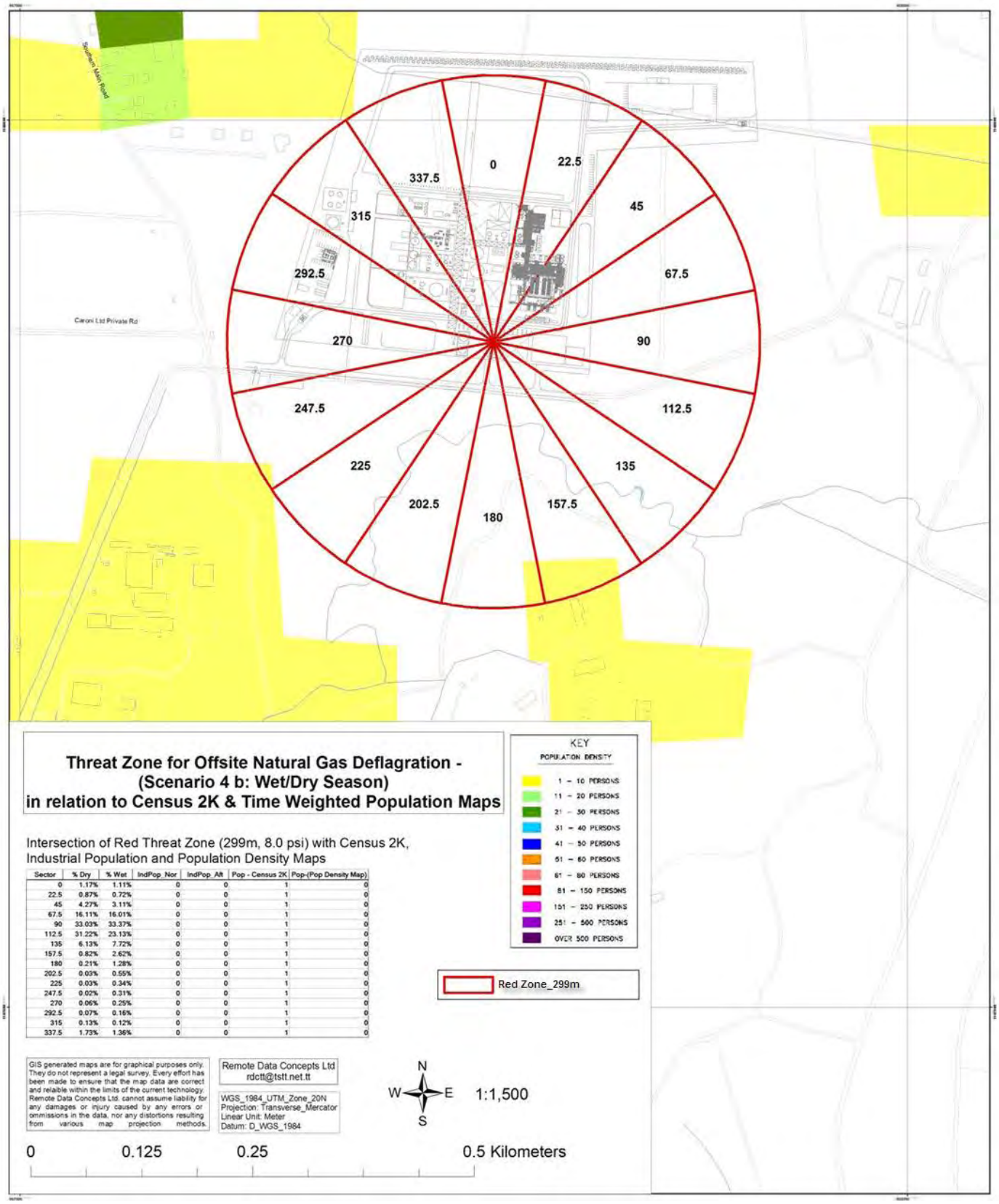
- Red Zone: 8.0 psi overpressure (high enough to cause destruction of buildings)
- Orange Zone: 3.5 psi overpressure (serious injury or fatality likely as a result of structural damage)
- Yellow Zone: 1.0 psi overpressure (high enough to shatter glass)

The orange zone corresponds to the zone in which serious injuries or fatalities could occur.

Modelling results for this scenario are shown in Figure 4.4-1. For this scenario:

- Red zone extends 299 metres from the offsite natural gas tie-in
- Orange zone extends 311 metres from the offsite natural gas tie-in
- Yellow zone extends 387 metres from the offsite natural gas tie-in

Detailed modelling assumptions and results for the offsite natural gas/deflagration scenario are shown in Appendix A.4. The orange zone was used in the individual risk analysis calculations.



Sector	% Dry	% Wet	IndPop_Nor	IndPop_Alt	Pop - Census 2K	Pop-(Pop Density Map)
0	1.17%	1.11%	0	0	1	0
22.5	0.87%	0.72%	0	0	1	0
45	4.27%	3.11%	0	0	1	0
67.5	16.11%	16.01%	0	0	1	0
90	33.03%	33.37%	0	0	1	0
112.5	31.22%	23.13%	0	0	1	0
135	6.13%	7.72%	0	0	1	0
157.5	0.82%	2.62%	0	0	1	0
180	0.21%	1.28%	0	0	1	0
202.5	0.03%	0.55%	0	0	1	0
225	0.03%	0.34%	0	0	1	0
247.5	0.02%	0.31%	0	0	1	0
270	0.06%	0.25%	0	0	1	0
292.5	0.07%	0.16%	0	0	1	0
315	0.13%	0.12%	0	0	1	0
337.5	1.73%	1.36%	0	0	1	0

Figure 4.4-1: Threat Zone for Offsite Natural Gas Deflagration (Scenario 4.b: Wet/Dry Season) in Relation to Time-weighted Population. (Same as in EIA document)

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5. SOCIETAL RISK ASSESSMENT

Figure 5.1-1 shows the Societal Risk Guidelines based on the Netherlands Curves and the results of the societal risk assessment for the modelled scenarios. The number of offsite residential individuals within the threshold area for each scenario is estimated using 2000 Census data and the frequency of wind direction. The number of offsite industrial workers within the threshold area for each scenario is estimated from the locations and employment data for neighbouring industrial facilities and the frequency of wind direction. The results of the population analysis for each scenario are depicted in Figures 4.1.1-1 through 4.4-1. The modelling thresholds and averaging times for chlorine and for hydrochloric acid shown in the figures are based on a 10-percent fatality rate; that is, an exposure of 140 ppm (406 mg/m^3) chlorine for an averaging time of 10 minutes corresponds to 10-percent fatality among exposed individuals.

Table 5.1-1 shows the offsite population exposure summary, including the number of residential individuals and industrial workers within the threshold area and the total number of individuals within the threshold area. As shown, based on the frequency and number of individuals within the zone of influence, all scenarios result in less than one modelled fatality except for Scenario 6.b, which results in two modelled fatalities. In addition, the modelling conducted for Scenario 4.b in the original EIA shows one modelled fatality. Therefore, all scenarios are within (i.e., below the lower curve of) the Dutch Societal Risk Guidelines.

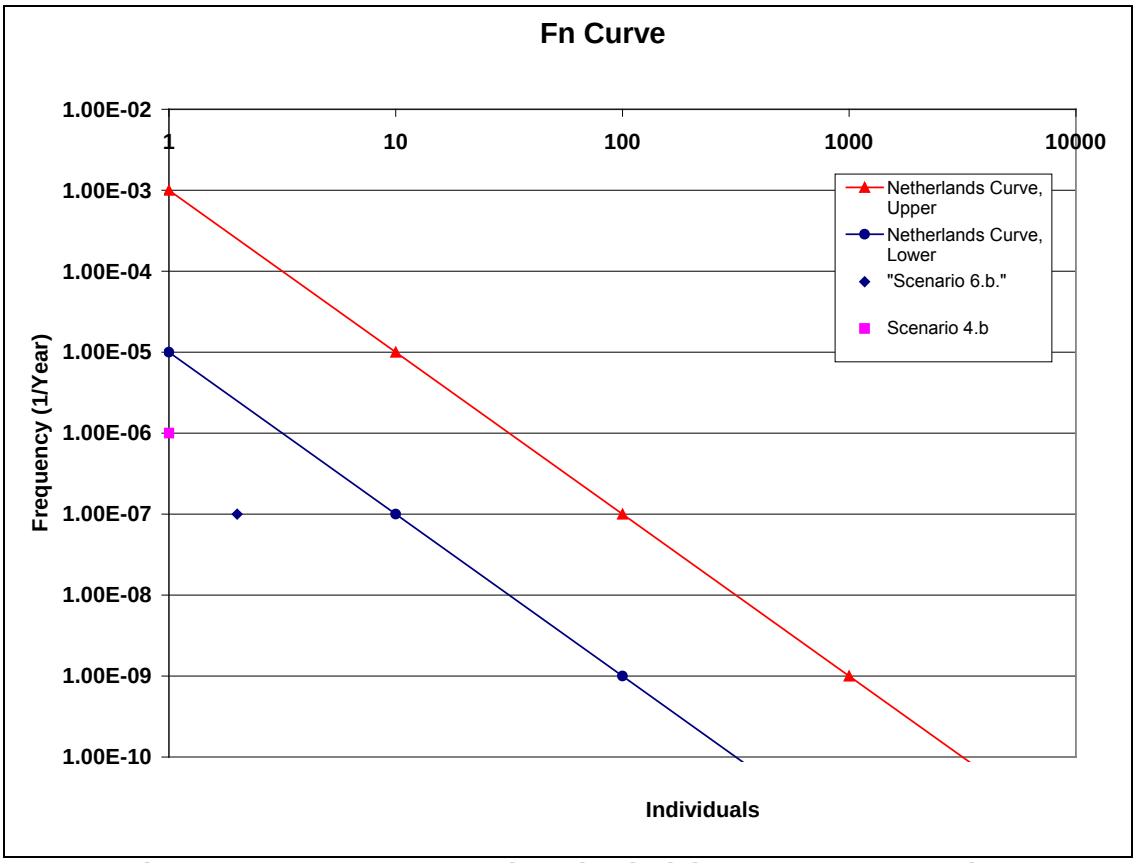


Figure 5.1-1: F-N Curve and Societal Risk Assessment Results.

Table 5.1-1: Offsite Population Summary

No.	Scenario	Type	Figure	Offsite Persons Within Plume Area			10% Fatality Threshold	Mitigated Frequency
				Resident	Industrial	Total		
1	*Onsite hazardous material (gaseous) release*							
1.a.1	Chlorine [indoor] process pipe breach	Cl_2 release	4.1.1-1	2	0	2	<1	$1x10^{-9}$ /yr
1.a.2.a	Chlorine [outdoor] process pipe breach [Full Breach]	Cl_2 release	4.1.2-1	<1	0	<1	<1	$1x10^{-9}$ /yr
1.a.3	Chlorine process pipe breach [Seismic Event]	Cl_2 release	4.1.3-1	2	0	2	<1	$1x10^{-8}$ /yr
1.b	Intermixing of Hypochlorite with HCl	Cl_2 release	4.1.4-1	<1	0	<1	<1	$1x10^{-7}$/yr
2	*Onsite hazardous material (liquid) release*							
2.b.	Vessel Failure: Onsite HCl storage tank [Full Breach]	HCl spill	4.2.1-1	<1	0	<1	<1	$1x10^{-8}$ /yr
2.c.	Vessel Failure: Onsite hypochlorite storage tank [Full Breach]	bleach spill - Cl_2 release	4.3.1-1	4	1	5	<1	$1x10^{-6}$ /yr
4	*Flammable gas release (deflagration)*							
4.b	Offsite Natural gas deflagration[a]	CH_4 release	4.4-1	1	0	1	1[a]	$1x10^{-6}$/yr
6	*Offsite transportation hazardous material release*							
6.a	Hydrochloric acid: tank truck accident	HCl spill	4.3.1-1	3	0	3	<1	$1x10^{-7}$ /yr
6.b	Hypochlorite: tank truck accident	bleach spill – Cl_2 release	4.3.1-2	18	2	20	2	$3x10^{-7}$ /yr

[a] 10% fatality was not calculated for scenario 4.b since it is not a chemical release. The number reported is total fatality.

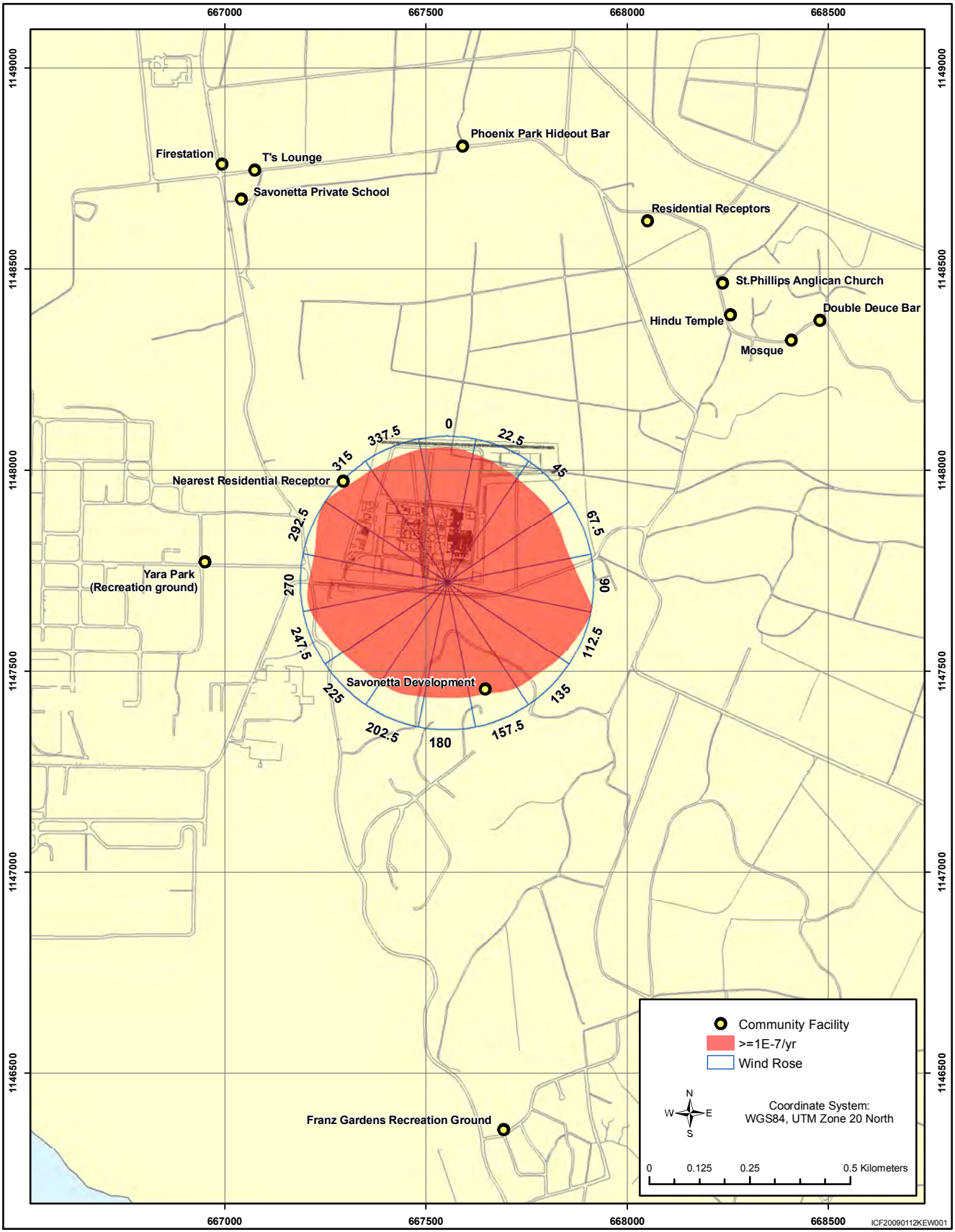
6. INDIVIDUAL RISK ASSESSMENT

As shown in Figure 6-1, only the 10^{-7} per year contour extends offsite when the new consequence modelling results are used. The contour is dominated by the natural gas deflagration (Scenario 4B). The contour is very close to the CariSal site—within approximately 300 metres. The slightly irregular shape of the contour reflects the dominant overpressure scenario and the fact that other scenarios make minor contributions to the overall risk level.

The contour for the mitigated frequencies is essentially identical because no specific mitigation measures were targeted toward the overpressure scenario (4B). The frequencies of other scenarios are reduced significantly, but this does not impact the 10^{-7} per year individual risk contour.

The 10^{-7} per year contour just includes the nearest residential receptor and the Savonetta Estate Development (residential neighbourhood) site. Individuals who are in the contour area less than 100 percent of the time will have lower risk levels.

The risks along the transportation route are also well below 10^{-7} per year at any given point, and the risk is limited to an area roughly 150 metres to either side of the roadway. The aggregate risk of a transportation accident is 6×10^{-7} per year (unmitigated case) or 4×10^{-7} per year (mitigated case). When the chance of a spill occurring within 150 metres of a particular location and the wind direction are factored in, along with the 10-percent chance of a fatality, given exposure, the individual risk levels along the route would be less than 10^{-8} per year.


667000
667500
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1149000
1148500
1148000
1147500
1147000
1146500
Phoenix Park Hideout Bar
Firestation
T's Lounge
Savonetta Private School
Residential Receptors
St.Phillips Anglican Church
Double Deuce Bar
Hindu Temple
Mosque
0
22.5
45
67.5
90
112.5
135
157.5
180
202.5
225
247.5
270
292.5
315
337.5
Nearest Residential Receptor
Yara Park
(Recreation ground)
Savonetta Development
Franz Gardens Recreation Ground
Community Facility
>=1E-7/yr
Wind Rose
N
W
E
S
Coordinate System:
WGS84, UTM Zone 20 North
0
0.125
0.25
0.5 Kilometers
ICF20090112KEW001

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APPENDIX A: MODELING PARAMETERS AND RESULTS FOR ACCIDENT SCENARIO RELEASE MODELING

A.1. Chlorine Release Scenarios

Site Conditions

Parameter	Value Dry Season
Wind speed/atmospheric stability combinations	0.6 m/s F
Ambient temperature	80 °F (26.6 °C)
Relative humidity	75%
Surface roughness height	0.04 m
Stability Class Values	6.0
Inverse Monin-Obukhov Length	0.0

Consequence Endpoints

Phenomenon	Measure	Concentration (ppm)	Averaging time (sec)	Comment
Outdoor				
Toxic cloud	**10% FATALITY**	140	600	Acute exposure
Indoor				
Toxic cloud	**10% FATALITY**	140	600	Acute exposure
Intermixing				
Toxic cloud	**10% FATALITY**	140	600	Acute exposure

Material Properties

Property	Cl_2	
MW	70.94	
Density	1574	Kg/m^3

A.1.1. Indoor Chlorine Release Scenarios

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Full Breach	47	1.6	30

Modelling Assumptions

The basic assumptions included in the modelling were:

- The ALOHA Model was used for modelling this scenario.
- Chlorine was modelled as a dense gas release.
- Threshold: 140 ppm Cl2
- Averaging time: dispersion to threshold target–600 seconds.
- Full breach: A catastrophic failure of the chlorine pipe will release approximately 103 pounds of chlorine across a period of 30 seconds.

Modelling Results

The dispersion modelling results are given below.

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 140 ppm
Full Breach	0.6	F	274

A.1.2. Outdoor Chlorine Release Scenarios

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Full Breach	47	1.6	30
Seismic	94	3.2	30

Modelling Assumptions

The basic assumptions included in the modelling were:

- The SLAB Model was used for modelling this scenario.
- Chlorine was modelled as a dense gas release.
- Threshold: 140 ppm Cl_2

- Averaging time: dispersion to threshold target–600 seconds.
- Full breach: A catastrophic failure of the chlorine pipe will release approximately 103 pounds of chlorine across a period of 30 seconds.
- Seismic Event: A simultaneous catastrophic failure of both chlorine pipes will release approximately 206 pounds of chlorine across a period of 30 seconds.

Modelling Results

The dispersion modelling results are given below.

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 140 ppm
Full Breach	0.6	F	208
Seismic Event	0.6	F	343

A.1.3. Hydrochloric Acid-Sodium Hypochlorite Intermixing Scenario

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Intermixing	54	0.3	180

Modelling Assumptions

The basic assumptions included in the modelling were:

- The SLAB Model was used for modelling this scenario.
- Chlorine was modelled as a dense gas release.
- Threshold: 140 ppm Cl_2.
- Averaging time: dispersion to threshold target–600 seconds.
- Intermixing: Intermixing of hydrochloric acid and sodium hypochlorite will release approximately 120 pounds of chlorine across a period of approximately 3 minutes.

Modelling Results

The dispersion modelling results are given below:

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 140 ppm
Intermixing	0.6	F	181

A.2. Hydrochloric Acid Release Scenarios

Site Conditions

Parameter	Value	
	Vessel Failure	Truck Accident
Wind speed/atmospheric stability combinations	0.6 m/s F	0.6 m/s F
Ambient temperature	80 °F (26.6 °C)	80 °F (26.6 °C)
Relative humidity	75%	75%
Surface roughness length	0.04 m	0.04 m
Stability Class Values	6.0	6.0
Inverse Monin-Obukhov Length	0.0	0.0

Consequence Endpoints

Phenomenon	Measure	Concentration (ppm)	Averaging time (sec)	Comment
Vessel Failure				
Toxic cloud	**10% FATALITY**	4000	1800	Acute exposure
Truck Accident				
Toxic cloud	**10% FATALITY**	4000	1800	Acute exposure

Material Properties

Property	HCl	
MW	36.46	
Density	1177	Kg/m^3

A.2.1. Hydrochloric Acid Vessel Failure Release Scenario

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Vessel Failure	1,789	0.5	3600

Modelling Assumptions

The basic assumptions included in the modelling were:

- The ALOHA Model was used to estimate the evaporation rate from the liquid pool, and the SLAB Model was used for dispersion modelling.
- Hydrochloric Acid release was modelled as an evaporative pool release.
- Threshold: 4000 ppm HCl
- Averaging time: dispersion to threshold target–1800 seconds.
- Hydrochloric acid tank vessel failure will release 1,789 kilograms across a period of approximately 60 minutes.

Modelling Results

The dispersion modelling results are given below.

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 4000 ppm
Vessel Failure	0.6	F	122

A.2.2. Offsite Hydrochloric Acid Tank Truck Accident Scenario

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Truck Accident	364	0.1	3600

Modelling Assumptions

The basic assumptions included in the modelling were:

- The ALOHA Model was used to estimate the evaporation rate from the liquid pool, and the SLAB Model was used for dispersion modelling.
- Hydrochloric Acid release was modelled as an evaporative pool release
- Threshold: 4000 ppm HCl
- Averaging time: dispersion to threshold target–1800 seconds.
- Hydrochloric acid tank truck accident will release 364 kilograms across a period of approximately 60 minutes.

Modelling Results

The dispersion modelling results are given below.

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 4000 ppm
Truck Accident	0.6	F	44

A.3. Sodium Hypochlorite Release Scenarios

Site Conditions

Parameter	Value	
	Vessel Failure	Truck Accident
Wind speed/atmospheric stability combinations	0.6 m/s F 0.6 m/s C 1.5 m/s C	0.6 m/s F
Ambient temperature	80 °F (26.6 °C)	80 °F (26.6 °C)
Relative humidity	75%	75%
Surface roughness length	0.04 m	0.04 m

Consequence Endpoints

Phenomenon	Measure	Concentration (ppm)	Averaging time (sec)	Comment
Vessel Failure				
Toxic cloud	**10% FATALITY**	80	1800	Acute exposure Cl_2
Truck Accident				
Toxic cloud	**10% FATALITY**	80	1800	Acute exposure Cl_2

Material Properties

Property	Cl_2	
MW	70.94	
Density	1574	Kg/m^3

A.3.1. Sodium Hypochlorite Vessel Failure Release Scenario

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Vessel Failure	287	1.7	169
Vessel Failure	287	1.7	169
Vessel Failure	287	1.7	169

Modelling Assumptions

The basic assumptions included in the modelling were:

- The SLAB Model was used for modelling this scenario.
- Sodium Hypochlorite release was modelled as a chlorine gas release evaporating from a pool of liquid sodium hypochlorite solution
- Threshold: 140 ppm Cl_2
- Averaging time: dispersion to threshold target–600 seconds.
- Sodium Hypochlorite tank vessel failure will release 287 kilograms of chlorine across a period of approximately 3 minutes.

Modelling Results

The dispersion modelling results are given below.

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 140 ppm
Vessel Failure	0.6	F	520
Vessel Failure	1.5	C	436
Vessel Failure	0.6	C	284

A.3.2. Offsite Sodium Hypochlorite Tank Truck Accident Scenario

Release Cases

Scenario	Quantity (kg)	Rate (kg/s)	Duration (seconds)
Truck Accident	30	1	30

Modelling Assumptions

The basic assumptions included in the modelling were:

- The SLAB Model was used for modelling this scenario.
- Sodium Hypochlorite release was modelled as a chlorine gas release evaporating from a pool of liquid sodium hypochlorite solution.
- Threshold: 140 ppm Cl_2.
- Averaging time: dispersion to threshold target–600 seconds.
- Sodium hypochlorite tank truck accident will release 30 kilograms of chlorine gas across a period of approximately 0.5 minutes.

Modelling Results

The dispersion modelling results are given below.

Scenario	Wind Speed (m/s)	Stability Class	Distance (m) to 140 ppm
Truck Accident	0.6	F	145

A.4. Offsite Natural Gas Release Scenario

Site Conditions

Parameter	Value
	Natural Gas Pipeline Release
Wind speed/atmospheric stability combinations	1.5 m/s F
Ambient temperature	80 °F (26.6 °C)
Relative humidity	70%

Release Cases

Scenario	Quantity (m^3)	Rate (kg/s)	Duration (seconds)
Natural Gas Pipeline Release	0.65	NA	instantaneous

Consequence Endpoints

Phenomenon	Measure	Pressure (psi)	Averaging time (sec)	Comment
Flammable Cloud	**DESTRUCTION OF BUILDINGS**	8.0	NA	Extent of fire/explosion
Flammable Cloud	Serious Injury or Fatality	3.5	NA	Extent of fire/explosion
Flammable Cloud	Shattered Glass	1.0	NA	Extent of fire/explosion

Modelling Assumptions

The basic assumptions included in the modelling were:

- The ALOHA Model was used for modelling this scenario.
- Natural gas (methane) release was modelled as an instantaneous explosion.
- Extent of fire/explosion target: 3.5 psi (serious injury or fatality occurrence).
- Averaging time: instantaneous release and explosion.
- Natural gas pipeline release will release 0.65 cubic meters of natural gas assumed instantaneously.

Material Properties

Property	CH_4
MW	16.04

Modelling Results

The natural gas release modelling results are as follows.

Scenario	Stability Class	Wind Speed (m/s)	Distance (m) to 1.0 psi pressure	Distance (m) to 3.5 psi pressure	Distance (m) to 8.0 psi pressure
Natural Gas Pipeline Release	F	1.5	387	311	299

APPENDIX B: INHALATION TOXICOLOGY OF HYDROGEN CHLORIDE

General Overview

Hydrogen chloride is a severe irritant to the respiratory tract which may produce coughing, burning of the throat, a choking sensation, laryngitis, glottal edema, bronchitis, pulmonary edema and possibly death after excessive exposures according to Sittig (1985), NIOSH (1981), and numerous other sources. Effects are usually limited to inflammation and occasional ulceration of the nose, throat, and larynx. However, if inhaled deeply and in sufficient concentrations, pulmonary edema may follow, and this can be lethal.

Estimates of Lethal Exposure Levels for Episodic Discharges

For consequence analysis purposes, it is desired to attempt to estimate those concentrations in air capable of causing deaths in at least some small fraction of exposed populations within the two time periods of 10 minutes (or less) and 30 minutes. These represent two distinct classes of release: 1) instantaneous loss of contents or a continuous discharge that is rapidly isolated; and 2) a continuous discharge that requires a longer time to isolate or which continues until available inventory is depleted.

Table 3.5-2 lists inhalation toxicity data available in the general literature for hydrogen chloride and hydrochloric acid. According to the report by the National Academy of Sciences (NAS), in a discussion of both acute and subacute (up to 50 day) exposures summarized by Environment Canada (1984), guinea pig deaths were attributed to acute respiratory damage. High concentrations caused necrosis of the trachea and bronchi, edema, atelectasis, emphysema, and damage to pulmonary blood vessels. Gross pathologic changes were noted in the livers of 79 percent of the guinea pigs that died; pulmonary lesions were noted in those that died or were sacrified between one and 18 months after exposure. Rabbits were more resistant to the immediate effects of hydrogen chloride vapor, but died later from pulmonary or nasal infections. Severe lesions were noted in the livers of 31 percent of the rabbits that died.

The above sources additionally note that mice appear to be more sensitive to the lethal effects of hydrogen chloride vapor than are rats, guinea pigs, rabbits, or monkeys. Within a given species, the degree of damage is related to the total dosage of exposure over the known ranges of concentration and exposure. The dosage causing 50 percent mortality for mice is about half that for rats. Data indicate that irreversible toxic effects or death will occur only rarely after single exposures of five minutes or more at a dosage of 10,000 mg-min/m3 or less, even in mice. The dosage for 50 percent mortality is about 100,000 mg-min/m3 for mice and about 250,000 mg-min/m3 for rats at exposure times of 5 or 30 minutes according to these sources.

Of key significance are the findings of Hinderer et al. (1986) which indicate that non-human primates appear to be substantially more resistant to the effects of hydrogen chloride inhalation exposure than mice and possibly other smaller experimental animals, and that this in turn suggests that humans may be substantially more resistant. In the words of these researchers, extracted from various portions of their work, "Within the last ten years, a considerable amount of data that refute many common perceptions about the effect of HCl has been generated. Many studies have provided additional information on, and further confirmation of, differences in

animal sensitivity to HCl. The results of this research indicate that man may be able to tolerate much higher levels than have often been claimed and that some animal species may be much more sensitive than others to this chemical... The results of the studies by ... are ... important because they indicate that the response of the rat to HCl is comparable to that of the baboon... The results of studies by ... have indicated that mice are three to ten times more sensitive than rats to HCl, based on the lowest lethal dose (LLD) observed. Similar results were reported by ... (in which) mice were approximately four times more sensitive to HCl based on LC50 values and ten times more sensitive based on the LLD. A comparison of the lethality data on HCl indicates that the mouse (LLD = 3200 ppm, 5 min) is more sensitive than the rat (LLD = 15,250 - 32,250 ppm, 5 min) or the primate (LLD = 16,570 - 30,000+ ppm, 5 min)... Although the LLD of the rat and baboon is comparable, this does not appear to be the case with longer exposures. For a 30-minute exposure to HCl, the LLD is 2,678 - 2,910 ppm for rats and greater than 5,000 ppm for baboons... These species differences are very important and must be taken into consideration, particularly if one wants to utilize data obtained with rodents for predicting qualitatively and quantitatively the response of humans to HCl."

With due consideration of the findings that primates are more resistant to the effects of HCl than some rodents, that past conclusions about the effects of HCl on man have been based on experimental data involving rodents, and that claims that concentrations on the order of 1300 to 2000 ppm may be lethal in a few moments to humans appear to be in error, it is concluded for the purposes of this study that that some small fraction of human populations may be fatally exposed at a concentration of 6000 ppm in air for 10 minutes (or less). Similarly, it is concluded that exposures of 4000 ppm for 30 or more minutes may be lethal to some small fraction of human populations.

Although the above estimates exceed those commonly found in the literature, they are nevertheless considered to be conservative. Note that data presented in Table X.X indicate that an exposure of 15,000 ppm for 10 minutes was survived by healthy baboons, this being substantially higher than the fatality limit of 6000 ppm selected for all humans (including children, the elderly, and the ill). Similarly, the 4000 ppm lethality limit chosen for 30 minute exposures for all humans is more conservative than the finding that baboons can survive exposures in excess of 5000 ppm for this time period.

References for Hydrogen Chloride

National Institute for Occupational Safety and Health (NIOSH), "Criteria for a Recommended Standard - Occupational Exposure to Ethylene Dichloride", U.S. Department of Health, Education, and Welfare, Cincinnati, Ohio. (1976)

Patty 1981: Clayton, G.D., Clayton, F.E. (ed.), "Patty's Industrial Hygiene and Toxicology", 3rd revised edition, John Wiley and Sons, New York, NY. (1981)

APPENDIX C: ALOHA MODEL RESULTS

Scenario 1.a.1

Text Summary ALOHA® 5.4.1

```
SITE DATA:
  Location: POINT LISAS, TRINIDAD AND TOBAGO
  Building Air Exchanges Per Hour: .4 (user specified)
  Time: January 8, 2009  1757 hours ST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: CHLORINE                Molecular Weight: 70.91 g/mol
  AEGL-1(60 min): 0.5 ppm   AEGL-2(60 min): 2 ppm   AEGL-3(60 min): 20 ppm
  IDLH: 10 ppm
  Ambient Boiling Point: -34.0° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 0.62 meters/second from 180° true at 3 meters
  Ground Roughness: open country         Cloud Cover: 3 tenths
  Air Temperature: 26.6° C               Stability Class: F
  No Inversion Height                    Relative Humidity: 75%

SOURCE STRENGTH:
  Direct Source: 47 kilograms            Source Height: 1 meters
  Release Duration: 1 minute
  Release Rate: 783 grams/sec
  Total Amount Released: 47.0 kilograms
  Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE:
  Model Run: Heavy Gas
  Red   : 274 meters --- (140 ppm)

THREAT AT POINT:
  Concentration Estimates at the point:
  Downwind: 273 meters                   Off Centerline: 71.0 meters
  Max Concentration:
     Outdoor: 139 ppm
     Indoor:  2.47 ppm
```

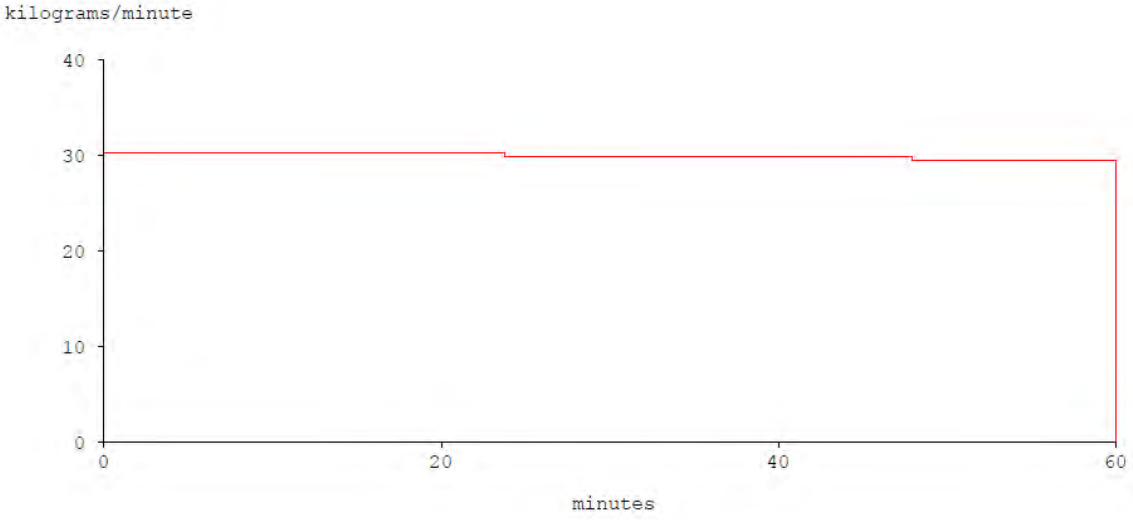
Scenario 2.b

Text Summary ALOHA® 5.4.1

```
SITE DATA:
  Location: POINT LISAS, TRINIDAD AND TOBAGO
  Building Air Exchanges Per Hour: .4 (user specified)
  Time: January 5, 2009  1231 hours ST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: HYDROCHLORIC ACID
  Solution Strength: 36% (by weight)
  Ambient Boiling Point: 56.5° C
  Partial Pressure at Ambient Temperature: 0.20 atm
  Ambient Saturation Concentration: 204,848 ppm or 20.5%
  Hazardous Component: HYDROGEN CHLORIDE
  Molecular Weight: 36.46 g/mol
  AEGL-1(60 min): 1.8 ppm   AEGL-2(60 min): 22 ppm   AEGL-3(60 min): 100 ppm
  IDLH: 50 ppm

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 0.62 meters/second from 180° true at 3 meters
  Ground Roughness: open country          Cloud Cover: 3 tenths
  Air Temperature: 26.6° C
  Stability Class: F (user override)
  No Inversion Height                     Relative Humidity: 75%

SOURCE STRENGTH:
  Evaporating Puddle
  Puddle Area: 911 square meters          Puddle Volume: 400000 gallons
  Ground Type: Concrete                   Ground Temperature: 26.6° C
  Initial Puddle Temperature: Ground temperature
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 30.1 kilograms/min
     (averaged over a minute or more)
  Total Amount Hazardous Component Released: 1,789 kilograms

THREAT ZONE:
  Model Run: Heavy Gas
  Red   : 53 meters --- (11600 mg/(cu m))
```

Source Strength (Evaporation Rate) ALOHA® 5.4.1

```
Time: January 5, 2009  1231 hours ST (using computer's clock)

Chemical Name: HYDROCHLORIC ACID
  Solution Strength: 36% (by weight)

  Hazardous Component: HYDROGEN CHLORIDE
SOURCE STRENGTH:
  Evaporating Puddle
  Puddle Area: 911 square meters         Puddle Volume: 400000 gallons
  Ground Type: Concrete                  Ground Temperature: 26.6° C
  Initial Puddle Temperature: Ground temperature
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 30.1 kilograms/min
     (averaged over a minute or more)
  Total Amount Hazardous Component Released: 1,789 kilograms
```



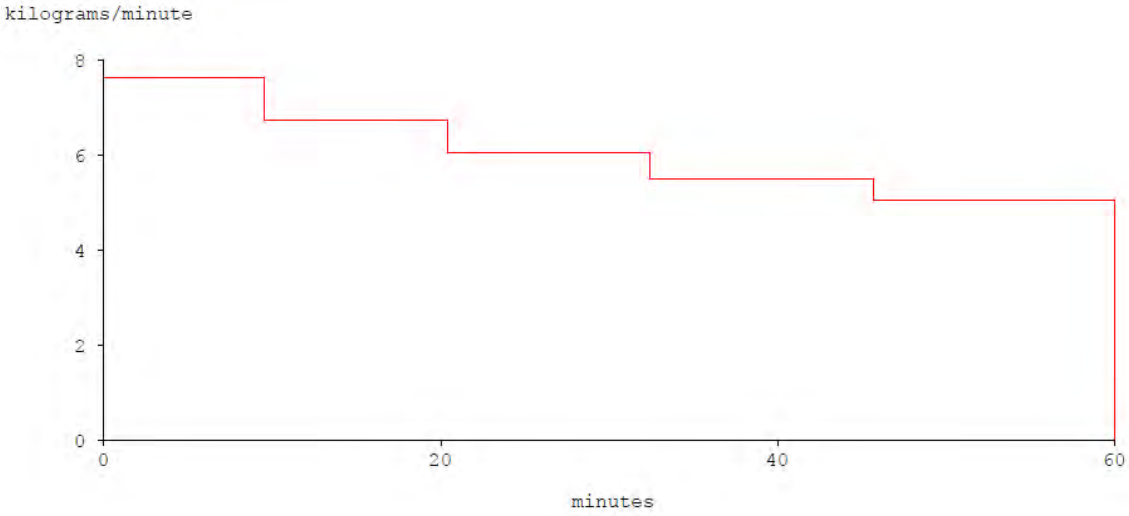
Scenario 6.a

Text Summary ALOHA® 5.4.1

```
SITE DATA:
  Location: POINT LISAS, TRINIDAD AND TOBAGO
  Building Air Exchanges Per Hour: .4 (user specified)
  Time: January 6, 2009  1110 hours ST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: HYDROCHLORIC ACID
  Solution Strength: 36% (by weight)
  Ambient Boiling Point: 56.5° C
  Partial Pressure at Ambient Temperature: 0.20 atm
  Ambient Saturation Concentration: 204,848 ppm or 20.5%
  Hazardous Component: HYDROGEN CHLORIDE
  Molecular Weight: 36.46 g/mol
  AEGL-1(60 min): 1.8 ppm   AEGL-2(60 min): 22 ppm   AEGL-3(60 min): 100 ppm
  IDLH: 50 ppm

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 0.62 meters/second from 180° true at 3 meters
  Ground Roughness: open country         Cloud Cover: 3 tenths
  Air Temperature: 26.6° C
  Stability Class: F (user override)
  No Inversion Height                    Relative Humidity: 75%

SOURCE STRENGTH:
  Evaporating Puddle
  Puddle Area: 227.4 square meters       Puddle Volume: 4000 gallons
  Ground Type: Default soil              Ground Temperature: 26.6° C
  Initial Puddle Temperature: Ground temperature
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 7.63 kilograms/min
     (averaged over a minute or more)
  Total Amount Hazardous Component Released: 364 kilograms

THREAT ZONE:
  Model Run: Heavy Gas
  Red   : 26 meters --- (11600 mg/(cu m))
  Note: Threat zone was not drawn because effects of near-field patchiness
    make dispersion predictions less reliable for short distances.
```

Source Strength (Evaporation Rate) ALOHA® 5.4.1

```
Time: January 6, 2009  1110 hours ST (using computer's clock)

Chemical Name: HYDROCHLORIC ACID
  Solution Strength: 36% (by weight)

  Hazardous Component: HYDROGEN CHLORIDE
SOURCE STRENGTH:
  Evaporating Puddle
  Puddle Area: 227.4 square meters       Puddle Volume: 4000 gallons
  Ground Type: Default soil              Ground Temperature: 26.6° C
  Initial Puddle Temperature: Ground temperature
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 7.63 kilograms/min
     (averaged over a minute or more)
  Total Amount Hazardous Component Released: 364 kilograms
```



APPENDIX D: SLAB MODEL RESULTS

Table C-1: Summary of SLAB Model Results

SLAB Variable Name	SLAB Variable	1.a.2	1.a.3	1.b	2.b	2.c	2.c, alternate met conditions 1	2.c, alternate met conditions 2	6.a	6.b
IDSL	Spill source type	2	2	3	1	1	1	1	1	1
NCALC	Numerical substep parameter	1	3	1	1	1	1	1	1	1
WMS	Molecular weight of source material (KG)	0.07091	0.07091	0.07091	0.03646	0.07091	0.07091	0.07091	0.03646	0.07091
CPS	Vapour heat capacity at constant pressure (J/KG-degree K)	498.1	498.1	498.1	795.0	498.1	498.1	498.1	795.0	498.1
TBP	Boiling point temperature (degree K)	239.1	239.1	239.1	329.5	239.1	239.1	239.1	329.5	239.1
CMDEO	Initial liquid mass fraction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DHE	Heat of vaporization (J/KG)	287840.0	287840.0	287840.0	443380.0	287840.0	287840.0	287840.0	443380.0	287840.0
CPSL	Liquid heat capacity (J/KG-degree K)	926.3	926.3	926.3	795.0	926.3	926.3	926.3	795.0	926.3
RHOSL	Liquid density of source material (KG/M3)	1574.0	1574.0	1574.0	1177.0	1574.0	1574.0	1574.0	1177.0	1574.0
SPB	Saturation pressure constant (default = -1)	1978.3	1978.3	1978.3	-1.0	1978.3	1978.3	1978.3	-1.0	1978.3
SPC	Saturation pressure constant (default = 0)	-27.0	-27.0	-27.0	0.0	-27.0	-27.0	-27.0	0.0	-27.0
TS	Temperature of source material (degree K)	299.2	299.2	299.2	299.8	299.8	299.8	299.8	299.8	299.8
QS	Mass source rate (KG/S)	1.6	3.2	0.302	0.5	1.7	1.7	1.7	0.1	1.0
AS	Source area (M2)	0.086	0.172	0.00203	911	426	426	426	227.4	231
TSD	Continuous source duration (S)	30.0	30.0	180.0	3600.0	169.0	169.0	169.0	3600.0	30
QTIS	Instantaneous source mass (KG)	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0
HS	Source height (M)	4.0	4.0	4.0	1.8	1.8	1.8	1.8	1	1
TAV	Concentration averaging time (S)	600.0	600.0	600.0	1800.0	600.0	600.0	600.0	1800.0	600.0
XFFM	Maximum downwind distance (M)	1000.0	1500.0	1000.0	500.0	2000.0	2000.0	2000.0	500.0	1500.0
ZP1	Height of concentration calculation (M)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ZO	Surface roughness height (M)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
ZA	Ambient measurement height (M)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
UA	Ambient wind speed (M/S)	0.6	0.6	0.6	0.6	0.6	1.5	0.6	0.6	0.6
TA	Ambient temperature (degree K)	299.8	299.8	299.8	299.8	299.8	299.8	299.8	299.8	299.8
RH	Relative humidity (percent)	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
STAB	Stability class values	6.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
ALA	Inverse Monin-Obukhov length	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Scenario 1.a.2

1a2 SLAB Results - Time averaged (tav = 600. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
1.00E+00	1.50E+01	3.00E+01	1.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.02E+00	1.50E+01	3.00E+01	1.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.04E+00	1.50E+01	3.00E+01	1.48E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.06E+00	1.51E+01	3.00E+01	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.08E+00	1.51E+01	3.00E+01	1.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.12E+00	1.51E+01	3.00E+01	1.52E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.15E+00	1.51E+01	3.00E+01	1.54E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.19E+00	1.52E+01	3.00E+01	1.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.24E+00	1.52E+01	3.00E+01	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.30E+00	1.53E+01	3.00E+01	1.61E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.36E+00	1.53E+01	3.00E+01	1.64E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.44E+00	1.54E+01	3.00E+01	1.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.53E+00	1.55E+01	3.00E+01	1.74E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.64E+00	1.56E+01	3.00E+01	1.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.76E+00	1.57E+01	3.00E+01	1.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.90E+00	1.59E+01	3.00E+01	1.97E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.07E+00	1.60E+01	3.00E+01	2.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.26E+00	1.62E+01	3.00E+01	2.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.48E+00	1.64E+01	3.00E+01	2.39E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.75E+00	1.67E+01	3.00E+01	2.61E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.05E+00	1.70E+01	3.00E+01	2.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.41E+00	1.73E+01	3.00E+01	3.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.83E+00	1.77E+01	3.00E+01	3.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.31E+00	1.82E+01	3.00E+01	4.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.88E+00	1.87E+01	3.00E+01	4.69E-01	1.12E-34	7.81E-35	2.57E-35	3.75E-36	2.29E-37	5.66E-39
5.54E+00	1.93E+01	3.00E+01	5.48E-01	1.30E-16	9.00E-17	2.95E-17	4.37E-18	2.81E-19	7.61E-21
6.31E+00	2.01E+01	3.00E+01	6.54E-01	4.91E-05	3.40E-05	1.11E-05	1.66E-06	1.11E-07	3.23E-09
7.21E+00	2.09E+01	3.00E+01	1.82E+00	1.45E-02	9.99E-03	3.26E-03	4.92E-04	3.37E-05	1.02E-06
8.25E+00	2.19E+01	3.00E+01	4.44E+00	7.98E-03	5.50E-03	1.79E-03	2.71E-04	1.87E-05	5.75E-07
9.47E+00	2.31E+01	3.00E+01	7.52E+00	5.44E-03	3.75E-03	1.22E-03	1.85E-04	1.28E-05	3.96E-07
1.09E+01	2.44E+01	3.00E+01	1.11E+01	4.13E-03	2.85E-03	9.29E-04	1.41E-04	9.75E-06	3.03E-07
1.26E+01	2.60E+01	3.00E+01	1.53E+01	3.31E-03	2.28E-03	7.44E-04	1.13E-04	7.82E-06	2.44E-07
1.45E+01	2.79E+01	3.00E+01	2.02E+01	2.72E-03	1.88E-03	6.12E-04	9.28E-05	6.44E-06	2.01E-07
1.67E+01	3.00E+01	3.00E+01	2.58E+01	2.28E-03	1.57E-03	5.11E-04	7.76E-05	5.39E-06	1.69E-07
1.86E+01	3.70E+01	2.03E+02	3.01E+01	6.77E-03	4.67E-03	1.52E-03	2.31E-04	1.60E-05	5.02E-07
2.04E+01	4.51E+01	2.74E+02	3.24E+01	5.43E-03	3.74E-03	1.22E-03	1.85E-04	1.28E-05	4.03E-07
2.26E+01	5.46E+01	3.09E+02	3.42E+01	4.15E-03	2.86E-03	9.31E-04	1.41E-04	9.82E-06	3.08E-07
2.54E+01	6.56E+01	3.26E+02	3.58E+01	3.12E-03	2.15E-03	7.01E-04	1.06E-04	7.41E-06	2.33E-07
2.89E+01	7.85E+01	3.35E+02	3.72E+01	2.35E-03	1.62E-03	5.27E-04	8.00E-05	5.57E-06	1.75E-07
3.33E+01	9.35E+01	3.40E+02	3.86E+01	1.77E-03	1.22E-03	3.97E-04	6.02E-05	4.19E-06	1.32E-07
3.88E+01	1.11E+02	3.44E+02	4.00E+01	1.34E-03	9.23E-04	3.01E-04	4.57E-05	3.18E-06	1.00E-07
4.57E+01	1.31E+02	3.49E+02	4.15E+01	1.02E-03	7.04E-04	2.29E-04	3.48E-05	2.43E-06	7.66E-08
5.42E+01	1.55E+02	3.55E+02	4.30E+01	7.85E-04	5.41E-04	1.76E-04	2.68E-05	1.87E-06	5.90E-08
6.49E+01	1.83E+02	3.63E+02	4.47E+01	6.07E-04	4.18E-04	1.36E-04	2.07E-05	1.45E-06	4.57E-08
7.82E+01	2.15E+02	3.73E+02	4.65E+01	4.71E-04	3.25E-04	1.06E-04	1.61E-05	1.12E-06	3.57E-08
9.46E+01	2.53E+02	3.87E+02	4.86E+01	3.67E-04	2.53E-04	8.23E-05	1.25E-05	8.77E-07	2.79E-08
1.15E+02	2.97E+02	4.03E+02	5.10E+01	2.86E-04	1.97E-04	6.42E-05	9.77E-06	6.85E-07	2.19E-08
1.40E+02	3.48E+02	4.24E+02	5.37E+01	2.23E-04	1.54E-04	5.00E-05	7.61E-06	5.35E-07	1.72E-08
1.70E+02	4.08E+02	4.50E+02	5.69E+01	1.74E-04	1.20E-04	3.89E-05	5.92E-06	4.17E-07	1.34E-08
2.08E+02	4.77E+02	4.81E+02	6.05E+01	1.34E-04	9.26E-05	3.01E-05	4.59E-06	3.24E-07	1.05E-08
2.53E+02	5.59E+02	5.17E+02	6.47E+01	1.03E-04	7.12E-05	2.32E-05	3.53E-06	2.50E-07	8.14E-09
3.09E+02	6.53E+02	5.61E+02	6.95E+01	7.89E-05	5.43E-05	1.77E-05	2.70E-06	1.91E-07	6.26E-09
3.77E+02	7.64E+02	6.12E+02	7.52E+01	5.96E-05	4.10E-05	1.33E-05	2.04E-06	1.45E-07	4.77E-09
4.60E+02	8.92E+02	6.72E+02	8.16E+01	4.45E-05	3.06E-05	9.95E-06	1.52E-06	1.09E-07	3.59E-09
5.61E+02	1.04E+03	7.42E+02	8.90E+01	3.28E-05	2.26E-05	7.34E-06	1.12E-06	8.03E-08	2.67E-09
6.83E+02	1.22E+03	8.24E+02	9.76E+01	2.39E-05	1.64E-05	5.33E-06	8.16E-07	5.85E-08	1.96E-09
8.32E+02	1.42E+03	9.20E+02	1.08E+02	1.71E-05	1.18E-05	3.82E-06	5.85E-07	4.21E-08	1.41E-09
1.01E+03	1.66E+03	1.03E+03	1.19E+02	1.21E-05	8.31E-06	2.70E-06	4.14E-07	2.98E-08	1.01E-09
1.23E+03	1.94E+03	1.16E+03	1.33E+02	8.43E-06	5.80E-06	1.88E-06	2.89E-07	2.08E-08	7.05E-10
1.50E+03	2.26E+03	1.31E+03	1.49E+02	5.81E-06	4.00E-06	1.30E-06	1.99E-07	1.44E-08	4.88E-10
1.82E+03	2.64E+03	1.48E+03	1.67E+02	3.97E-06	2.73E-06	8.86E-07	1.36E-07	9.81E-09	3.34E-10

```
Problem Input
idspl =         2        release gas properties
ncalc =         3
wms   =   .070910         molecular weight of source gas (kg)              - wms  =  7.0910E-02
cps   =    498.10         vapor heat capacity, const. p.  (j/kg-k)         - cps  =  4.9810E+02
tbp   =    239.10         temperature of source gas (k)                    - ts   =  2.9920E+02
cmed0 =       .00         density of source gas (kg/m3)                    - rhos =  2.8883E+00
dhe   =   287840.         boiling point temperature                        - tbp  =  2.3910E+02
cpsl  =    926.30         liquid mass fraction                             - cmed0=  0.0000E+00
rhosl =   1574.00         liquid heat capacity (j/kg-k)                    - cpsl =  9.2630E+02
spb   =   1978.34         heat of vaporization (j/kg)                      - dhe  =  2.8784E+05
spc   =    -27.01         liquid source density (kg/m3)                    - rhosl=  1.5740E+03
ts    =    299.20         saturation pressure constant                     - spa  =  9.3278E+00
qs    =      3.20         saturation pressure constant (k)                 - spb  =  1.9783E+03
as    =       .17         saturation pressure constant (k)                 - spc  = -2.7010E+01
tsd   =       30.
qtis  =       .00        spill characteristics
hs    =      4.00
tav   =    600.00         spill type                                       - idspl=          2
xffm  =   1500.00         mass source rate (kg/s)                          - qs   =  3.2000E+00
zp(1) =       .00         continuous source duration (s)                   - tsd  =  3.0000E+01
zp(2) =       .00         continuous source mass (kg)                      - qtcs =  9.6000E+01
zp(3) =       .00         instantaneous source mass (kg)                   - qtis =  0.0000E+00
zp(4) =       .00         source area (m2)                                 - as   =  1.7200E-01
z0    =   .040000         vertical vapor velocity (m/s)                    - ws   =  0.0000E+00
za    =      3.00         source half width (m)                            - bs   =  2.0736E-01
ua    =       .60         source height (m)                                - hs   =  4.0000E+00
ta    =    299.75         horizontal vapor velocity (m/s)                  - us   =  6.4415E+00
rh    =     75.00
stab  =      6.00

field parameters

 concentration averaging time (s)                  - tav  =  6.0000E+02
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  1.5000E+03
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
                                                   - zp(4)=  0.0000E+00

ambient meteorological properties
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02

additional parameters
 sub-step multiplier                              - ncalc =          3
 number of calculational sub-steps                - nssm  =          9
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01

c(x,y,z,t) = cc(x) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))
   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)                                  exp = exponential function
            t = time (s)                                   za = (z-zc)/(sr2*sig)
          erf = error functon                              zb = (z+zc)/(sr2*sig)
           xa = (x-xc+bx)/(sr2*betax)                      sr2 = sqrt(2.0)
           xb = (x-xc-bx)/(sr2*betax)
           ya = (y+b)/(sr2*betac)
           yb = (y-b)/(sr2*betac)
```

Scenario 1.a.3

1a3 SLAB Results - Time averaged (tav = 600. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
1.00E+00	1.50E+01	3.00E+01	2.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.02E+00	1.50E+01	3.00E+01	2.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.04E+00	1.50E+01	3.00E+01	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.06E+00	1.51E+01	3.00E+01	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.09E+00	1.51E+01	3.00E+01	2.11E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.12E+00	1.51E+01	3.00E+01	2.12E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.16E+00	1.51E+01	3.00E+01	2.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.21E+00	1.52E+01	3.00E+01	2.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.26E+00	1.52E+01	3.00E+01	2.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.32E+00	1.53E+01	3.00E+01	2.21E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.40E+00	1.54E+01	3.00E+01	2.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.48E+00	1.54E+01	3.00E+01	2.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.58E+00	1.55E+01	3.00E+01	2.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.70E+00	1.56E+01	3.00E+01	2.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.84E+00	1.58E+01	3.00E+01	2.48E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.01E+00	1.59E+01	3.00E+01	2.57E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.20E+00	1.61E+01	3.00E+01	2.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.42E+00	1.63E+01	3.00E+01	2.82E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.69E+00	1.65E+01	3.00E+01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.00E+00	1.68E+01	3.00E+01	3.23E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.37E+00	1.71E+01	3.00E+01	3.51E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.79E+00	1.75E+01	3.00E+01	3.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.30E+00	1.79E+01	3.00E+01	4.30E-01	7.99E-44	5.75E-44	1.96E-44	2.80E-45	0.00E+00	0.00E+00
4.89E+00	1.85E+01	3.00E+01	4.85E-01	2.50E-28	1.77E-28	5.87E-29	8.12E-30	4.28E-31	8.17E-33
5.58E+00	1.91E+01	3.00E+01	5.55E-01	2.73E-15	1.91E-15	6.31E-16	9.02E-17	5.20E-18	1.16E-19
6.39E+00	1.98E+01	3.00E+01	6.54E-01	4.45E-06	3.10E-06	1.02E-06	1.49E-07	9.20E-09	2.31E-10
7.35E+00	2.07E+01	3.00E+01	1.29E+00	1.43E-02	9.91E-03	3.25E-03	4.82E-04	3.13E-05	8.58E-07
8.47E+00	2.17E+01	3.00E+01	3.43E+00	1.35E-02	9.35E-03	3.06E-03	4.57E-04	3.01E-05	8.55E-07
9.79E+00	2.29E+01	3.00E+01	6.10E+00	8.93E-03	6.18E-03	2.02E-03	3.03E-04	2.02E-05	5.81E-07
1.13E+01	2.42E+01	3.00E+01	9.39E+00	6.59E-03	4.55E-03	1.49E-03	2.23E-04	1.50E-05	4.36E-07
1.31E+01	2.59E+01	3.00E+01	1.34E+01	5.18E-03	3.58E-03	1.17E-03	1.76E-04	1.18E-05	3.47E-07
1.53E+01	2.78E+01	3.00E+01	1.84E+01	4.22E-03	2.92E-03	9.52E-04	1.43E-04	9.66E-06	2.85E-07
1.78E+01	3.00E+01	3.00E+01	2.45E+01	3.51E-03	2.42E-03	7.91E-04	1.19E-04	8.04E-06	2.39E-07
1.99E+01	3.61E+01	1.65E+02	2.98E+01	9.68E-03	6.69E-03	2.18E-03	3.29E-04	2.22E-05	6.61E-07
2.19E+01	4.33E+01	2.53E+02	3.30E+01	9.13E-03	6.31E-03	2.06E-03	3.10E-04	2.10E-05	6.24E-07
2.40E+01	5.17E+01	3.11E+02	3.56E+01	7.90E-03	5.45E-03	1.78E-03	2.68E-04	1.82E-05	5.41E-07
2.65E+01	6.15E+01	3.49E+02	3.78E+01	6.57E-03	4.54E-03	1.48E-03	2.23E-04	1.51E-05	4.51E-07
2.95E+01	7.31E+01	3.74E+02	3.99E+01	5.32E-03	3.68E-03	1.20E-03	1.81E-04	1.22E-05	3.65E-07
3.32E+01	8.67E+01	3.91E+02	4.19E+01	4.22E-03	2.91E-03	9.51E-04	1.43E-04	9.72E-06	2.91E-07
3.78E+01	1.03E+02	4.02E+02	4.39E+01	3.30E-03	2.28E-03	7.43E-04	1.12E-04	7.60E-06	2.28E-07
4.36E+01	1.21E+02	4.10E+02	4.59E+01	2.55E-03	1.76E-03	5.75E-04	8.67E-05	5.89E-06	1.77E-07
5.08E+01	1.43E+02	4.17E+02	4.80E+01	1.96E-03	1.35E-03	4.42E-04	6.67E-05	4.53E-06	1.36E-07
5.98E+01	1.69E+02	4.24E+02	5.02E+01	1.50E-03	1.04E-03	3.39E-04	5.11E-05	3.48E-06	1.05E-07
7.11E+01	1.99E+02	4.33E+02	5.26E+01	1.15E-03	7.95E-04	2.59E-04	3.91E-05	2.67E-06	8.06E-08
8.52E+01	2.35E+02	4.44E+02	5.52E+01	8.80E-04	6.07E-04	1.98E-04	2.99E-05	2.04E-06	6.19E-08
1.03E+02	2.77E+02	4.57E+02	5.81E+01	6.72E-04	4.64E-04	1.51E-04	2.29E-05	1.57E-06	4.76E-08
1.25E+02	3.26E+02	4.75E+02	6.14E+01	5.13E-04	3.54E-04	1.15E-04	1.74E-05	1.20E-06	3.66E-08
1.52E+02	3.83E+02	4.97E+02	6.50E+01	3.90E-04	2.69E-04	8.77E-05	1.33E-05	9.13E-07	2.81E-08
1.86E+02	4.51E+02	5.25E+02	6.92E+01	2.96E-04	2.04E-04	6.64E-05	1.01E-05	6.95E-07	2.15E-08
2.28E+02	5.30E+02	5.59E+02	7.39E+01	2.23E-04	1.54E-04	5.00E-05	7.59E-06	5.26E-07	1.64E-08
2.79E+02	6.23E+02	5.99E+02	7.93E+01	1.67E-04	1.15E-04	3.74E-05	5.68E-06	3.95E-07	1.24E-08
3.43E+02	7.32E+02	6.48E+02	8.54E+01	1.24E-04	8.54E-05	2.78E-05	4.22E-06	2.95E-07	9.34E-09
4.22E+02	8.60E+02	7.06E+02	9.24E+01	9.12E-05	6.28E-05	2.04E-05	3.11E-06	2.18E-07	6.96E-09
5.19E+02	1.01E+03	7.75E+02	1.00E+02	6.63E-05	4.57E-05	1.49E-05	2.26E-06	1.59E-07	5.13E-09
6.39E+02	1.19E+03	8.57E+02	1.10E+02	4.76E-05	3.28E-05	1.07E-05	1.63E-06	1.15E-07	3.74E-09
7.86E+02	1.39E+03	9.52E+02	1.20E+02	3.38E-05	2.32E-05	7.56E-06	1.15E-06	8.20E-08	2.69E-09
9.65E+02	1.64E+03	1.07E+03	1.32E+02	2.36E-05	1.63E-05	5.29E-06	8.08E-07	5.76E-08	1.90E-09
1.19E+03	1.92E+03	1.20E+03	1.47E+02	1.64E-05	1.12E-05	3.65E-06	5.59E-07	4.00E-08	1.33E-09
1.45E+03	2.26E+03	1.35E+03	1.63E+02	1.12E-05	7.69E-06	2.50E-06	3.82E-07	2.74E-08	9.18E-10
1.78E+03	2.65E+03	1.53E+03	1.82E+02	7.56E-06	5.20E-06	1.69E-06	2.58E-07	1.86E-08	6.26E-10
2.18E+03	3.11E+03	1.74E+03	2.05E+02	5.07E-06	3.48E-06	1.13E-06	1.73E-07	1.25E-08	4.22E-10

```
Problem Input
  idspl =         2  release gas properties
  ncalc =         3
  wms   =   .070910  molecular weight of source gas (kg)              - wms  =  7.0910E-02
  cps   =    498.10   vapor heat capacity, const. p.  (j/kg-k)        - cps  =  4.9810E+02
  tbp   =    239.10   temperature of source gas (k)                   - ts   =  2.9920E+02
  cmed0 =       .00   density of source gas (kg/m3)                   - rhos =  2.8883E+00
  dhe   =   287840.   boiling point temperature                       - tbp  =  2.3910E+02
  cpsl  =    926.30   liquid mass fraction                            - cmed0=  0.0000E+00
  rhosl =   1574.00   liquid heat capacity (j/kg-k)                   - cpsl =  9.2630E+02
  spb   =   1978.34   heat of vaporization (j/kg)                     - dhe  =  2.8784E+05
  spc   =    -27.01   liquid source density (kg/m3)                   - rhosl=  1.5740E+03
  ts    =    299.20   saturation pressure constant                    - spa  =  9.3278E+00
  qs    =      3.20   saturation pressure constant (k)                - spb  =  1.9783E+03
  as    =       .17   saturation pressure constant (k)                - spc  = -2.7010E+01
  tsd   =       30.
  qtis  =       .00  spill characteristics
  hs    =      4.00
  tav   =    600.00   spill type                                      - idspl = 2
  xffm  =   1500.00   mass source rate (kg/s)                         - qs   =  3.2000E+00
  zp(1) =       .00   continuous source duration (s)                  - tsd  =  3.0000E+01
  zp(2) =       .00   continuous source mass (kg)                     - qtcs =  9.6000E+01
  zp(3) =       .00   instantaneous source mass (kg)                  - qtis =  0.0000E+00
  zp(4) =       .00   source area (m2)                                - as   =  1.7200E-01
  z0    =   .040000   vertical vapor velocity (m/s)                   - ws   =  0.0000E+00
  za    =      3.00   source half width (m)                           - bs   =  2.0736E-01
  ua    =       .60   source height (m)                               - hs   =  4.0000E+00
  ta    =    299.75   horizontal vapor velocity (m/s)                 - us   =  6.4415E+00
  rh    =     75.00
  stab  =      6.00

field parameters

 concentration averaging time (s)                  - tav  =  6.0000E+02
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  1.5000E+03
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
                                                   - zp(4)=  0.0000E+00

ambient meteorological properties
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02

additional parameters
sub-step multiplier                              - ncalc =           3
 number of calculational sub-steps                - nssm  =           9
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01

c(x,y,z,t) = cc(x) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)
            t = time (s)

          erf = error functon                za = (z-zc)/(sr2*sig)
           xa = (x-xc+bx)/(sr2*bet           zb = (z+zc)/(sr2*sig)
           xb = (x-xc-bx)/(sr2*bet          sr2 = sqrt(2.0)
           ya = (y+b)/(sr2*betac)
           yb = (y-b)/(sr2*betac)
          exp = exponential function
```

Scenario 1.b

1b SLAB Results - Time averaged (tav = 600. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
1.00E+00	9.00E+01	1.80E+02	2.25E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.20E+00	9.04E+01	1.80E+02	2.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.40E+00	9.08E+01	1.80E+02	4.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.60E+00	9.11E+01	1.80E+02	6.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.80E+00	9.15E+01	1.80E+02	8.54E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.01E+00	9.19E+01	1.80E+02	1.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.21E+00	9.23E+01	1.80E+02	1.27E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.41E+00	9.27E+01	1.80E+02	1.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.61E+00	9.30E+01	1.80E+02	1.69E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.81E+00	9.34E+01	1.80E+02	1.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.01E+00	9.38E+01	1.80E+02	2.10E+00	3.55E-40	2.44E-40	7.92E-41	1.21E-41	8.79E-43	2.94E-44
3.06E+00	9.39E+01	1.80E+02	2.10E+00	3.60E-40	2.47E-40	8.03E-41	1.23E-41	8.90E-43	3.08E-44
3.13E+00	9.40E+01	1.80E+02	2.11E+00	3.68E-40	2.53E-40	8.21E-41	1.26E-41	9.11E-43	3.08E-44
3.20E+00	9.42E+01	1.80E+02	2.11E+00	3.86E-40	2.65E-40	8.61E-41	1.32E-41	9.54E-43	3.22E-44
3.29E+00	9.43E+01	1.80E+02	2.11E+00	4.19E-40	2.88E-40	9.36E-41	1.44E-41	1.04E-42	3.50E-44
3.39E+00	9.45E+01	1.80E+02	2.12E+00	4.81E-40	3.31E-40	1.07E-40	1.65E-41	1.19E-42	4.06E-44
3.51E+00	9.47E+01	1.80E+02	2.12E+00	5.98E-40	4.11E-40	1.33E-40	2.04E-41	1.48E-42	5.04E-44
3.65E+00	9.50E+01	1.80E+02	2.13E+00	8.30E-40	5.70E-40	1.85E-40	2.84E-41	2.05E-42	7.01E-44
3.81E+00	9.53E+01	1.80E+02	2.13E+00	1.35E-39	9.28E-40	3.01E-40	4.62E-41	3.34E-42	1.14E-43
4.01E+00	9.57E+01	1.80E+02	2.14E+00	2.75E-39	1.89E-39	6.13E-40	9.39E-41	6.79E-42	2.31E-43
4.23E+00	9.61E+01	1.80E+02	2.15E+00	7.62E-39	5.24E-39	1.70E-39	2.61E-40	1.89E-41	6.43E-43
4.50E+00	9.66E+01	1.80E+02	2.16E+00	3.25E-38	2.23E-38	7.24E-39	1.11E-39	8.03E-41	2.74E-42
4.82E+00	9.72E+01	1.80E+02	2.17E+00	2.48E-37	1.71E-37	5.54E-38	8.49E-39	6.14E-40	2.09E-41
5.19E+00	9.79E+01	1.80E+02	2.18E+00	4.17E-36	2.87E-36	9.30E-37	1.43E-37	1.03E-38	3.52E-40
5.62E+00	9.88E+01	1.80E+02	2.20E+00	1.98E-34	1.36E-34	4.42E-35	6.78E-36	4.90E-37	1.67E-38
6.14E+00	9.97E+01	1.80E+02	2.22E+00	3.59E-32	2.47E-32	8.02E-33	1.23E-33	8.89E-35	3.04E-36
6.74E+00	1.01E+02	1.80E+02	2.25E+00	5.84E-29	4.02E-29	1.30E-29	2.00E-30	1.45E-31	4.93E-33
7.45E+00	1.02E+02	1.80E+02	2.27E+00	2.80E-24	1.92E-24	6.25E-25	9.58E-26	6.93E-27	2.36E-28
8.28E+00	1.04E+02	1.80E+02	2.31E+00	1.40E-18	9.62E-19	3.12E-19	4.79E-20	3.47E-21	1.18E-22
9.26E+00	1.06E+02	1.80E+02	2.35E+00	3.62E-12	2.49E-12	8.08E-13	1.24E-13	8.97E-15	3.06E-16
1.04E+01	1.08E+02	1.80E+02	2.40E+00	4.53E-06	3.11E-06	1.01E-06	1.55E-07	1.12E-08	3.83E-10
1.18E+01	1.10E+02	1.80E+02	3.62E+00	6.08E-03	4.18E-03	1.36E-03	2.08E-04	1.51E-05	5.14E-07
1.34E+01	1.13E+02	1.80E+02	1.05E+01	4.92E-03	3.38E-03	1.10E-03	1.68E-04	1.22E-05	4.16E-07
1.52E+01	1.17E+02	1.80E+02	1.67E+01	3.36E-03	2.31E-03	7.50E-04	1.15E-04	8.33E-06	2.85E-07
1.75E+01	1.21E+02	1.80E+02	2.21E+01	2.47E-03	1.70E-03	5.51E-04	8.44E-05	6.11E-06	2.08E-07
2.00E+01	1.26E+02	1.80E+02	2.69E+01	1.92E-03	1.32E-03	4.29E-04	6.58E-05	4.76E-06	1.62E-07
2.31E+01	1.32E+02	1.80E+02	3.15E+01	1.55E-03	1.07E-03	3.46E-04	5.31E-05	3.84E-06	1.31E-07
2.67E+01	1.39E+02	1.80E+02	3.60E+01	1.28E-03	8.80E-04	2.86E-04	4.38E-05	3.17E-06	1.08E-07
3.09E+01	1.47E+02	1.80E+02	4.03E+01	1.07E-03	7.35E-04	2.39E-04	3.66E-05	2.65E-06	9.04E-08
3.59E+01	1.56E+02	1.80E+02	4.47E+01	8.99E-04	6.18E-04	2.01E-04	3.08E-05	2.23E-06	7.60E-08
4.17E+01	1.67E+02	1.80E+02	4.91E+01	7.58E-04	5.21E-04	1.69E-04	2.59E-05	1.88E-06	6.40E-08
4.86E+01	1.80E+02	1.80E+02	5.35E+01	6.40E-04	4.40E-04	1.43E-04	2.19E-05	1.58E-06	5.41E-08
5.66E+01	1.98E+02	2.14E+02	5.78E+01	5.96E-04	4.10E-04	1.33E-04	2.04E-05	1.48E-06	5.04E-08
6.61E+01	2.19E+02	2.47E+02	6.18E+01	5.21E-04	3.58E-04	1.16E-04	1.78E-05	1.29E-06	4.40E-08
7.74E+01	2.43E+02	2.76E+02	6.56E+01	4.35E-04	2.99E-04	9.72E-05	1.49E-05	1.08E-06	3.69E-08
9.10E+01	2.72E+02	3.04E+02	6.90E+01	3.54E-04	2.44E-04	7.91E-05	1.21E-05	8.78E-07	3.00E-08
1.07E+02	3.06E+02	3.30E+02	7.23E+01	2.84E-04	1.95E-04	6.34E-05	9.72E-06	7.04E-07	2.40E-08
1.27E+02	3.46E+02	3.56E+02	7.55E+01	2.26E-04	1.55E-04	5.04E-05	7.72E-06	5.59E-07	1.91E-08
1.52E+02	3.93E+02	3.83E+02	7.86E+01	1.79E-04	1.23E-04	3.98E-05	6.11E-06	4.42E-07	1.51E-08
1.81E+02	4.48E+02	4.12E+02	8.18E+01	1.41E-04	9.67E-05	3.14E-05	4.81E-06	3.49E-07	1.19E-08
2.18E+02	5.13E+02	4.44E+02	8.52E+01	1.11E-04	7.60E-05	2.47E-05	3.78E-06	2.74E-07	9.37E-09
2.63E+02	5.89E+02	4.81E+02	8.89E+01	8.66E-05	5.95E-05	1.93E-05	2.96E-06	2.14E-07	7.33E-09
3.17E+02	6.78E+02	5.24E+02	9.30E+01	6.74E-05	4.63E-05	1.50E-05	2.31E-06	1.67E-07	5.71E-09
3.84E+02	7.84E+02	5.74E+02	9.77E+01	5.20E-05	3.58E-05	1.16E-05	1.78E-06	1.29E-07	4.40E-09
4.67E+02	9.08E+02	6.33E+02	1.03E+02	3.98E-05	2.73E-05	8.87E-06	1.36E-06	9.85E-08	3.37E-09
5.67E+02	1.05E+03	7.02E+02	1.09E+02	3.00E-05	2.06E-05	6.70E-06	1.03E-06	7.44E-08	2.54E-09
6.91E+02	1.23E+03	7.83E+02	1.17E+02	2.23E-05	1.53E-05	4.98E-06	7.64E-07	5.53E-08	1.89E-09
8.41E+02	1.43E+03	8.78E+02	1.26E+02	1.63E-05	1.12E-05	3.64E-06	5.59E-07	4.05E-08	1.38E-09
1.03E+03	1.66E+03	9.90E+02	1.36E+02	1.17E-05	8.07E-06	2.62E-06	4.02E-07	2.91E-08	9.94E-10
1.25E+03	1.94E+03	1.12E+03	1.49E+02	8.31E-06	5.71E-06	1.85E-06	2.84E-07	2.06E-08	7.05E-10
1.52E+03	2.27E+03	1.27E+03	1.64E+02	5.79E-06	3.98E-06	1.29E-06	1.98E-07	1.44E-08	4.91E-10

```
Problem Input
  idspl =         3     release gas properties
  ncalc =         1
  wms   =   .070910      molecular weight of source gas (kg)              - wms  =  7.0910E-02
  cps   =    498.10      vapor heat capacity, const. p.  (j/kg-k)         - cps  =  4.9810E+02
  tbp   =    239.10      temperature of source gas (k)                    - ts   =  2.9975E+02
  cmed0 =       .00      density of source gas (kg/m3)                    - rhos =  2.8830E+00
  dhe   =   287840.      boiling point temperature                        - tbp  =  2.3910E+02
  cpsl  =    926.30      liquid mass fraction                             - cmed0=  0.0000E+00
  rhosl =   1574.00      liquid heat capacity (j/kg-k)                    - cpsl =  9.2630E+02
  spb   =   1978.34      heat of vaporization (j/kg)                      - dhe  =  2.8784E+05
  spc   =    -27.01      liquid source density (kg/m3)                    - rhosl=  1.5740E+03
  ts    =    299.75      saturation pressure constant                     - spa  =  9.3278E+00
  qs    =       .30      saturation pressure constant (k)                 - spb  =  1.9783E+03
  as    =       .00      saturation pressure constant (k)                 - spc  = -2.7010E+01
  tsd   =      180.
  qtis  =       .00     spill characteristics
  hs    =      4.00
  tav   =    600.00      spill type                                       - idspl=          3
  xffm  =   1000.00      mass source rate (kg/s)                          - qs   =  3.0200E-01
  zp(1) =       .00      continuous source duration (s)                   - tsd  =  1.8000E+02
  zp(2) =       .00      continuous source mass (kg)                      - qtcs =  5.4360E+01
  zp(3) =       .00      instantaneous source mass (kg)                   - qtis =  0.0000E+00
  zp(4) =       .00      source area (m2)                                 - as   =  2.0300E-03
  z0    =   .040000      vertical vapor velocity (m/s)                    - ws   =  5.1603E+01
  za    =      3.00      source half width (m)                            - bs   =  2.2528E-02
  ua    =       .60      source height (m)                                - hs   =  4.0000E+00
  ta    =    299.75      horizontal vapor velocity (m/s)                  - us   =  0.0000E+00
  rh    =     75.00
  stab  =      6.00

field parameters

 concentration averaging time (s)                  - tav  =  6.0000E+02
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  1.0000E+03
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
                                                   - zp(4)=  0.0000E+00

ambient meteorological properties
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02

additional parameters
 sub-step multiplier                              - ncalc =          1
 number of calculational sub-steps                - nssm  =          3
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01

c(x,y,z,t) = cc(x) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)
            t = time (s)

          erf = error functon                              yb = (y-b)/(sr2*betac)
           xa = (x-xc+bx)/(sr2*betax)                     exp = exponential function
           xb = (x-xc-bx)/(sr2*betax)                      za = (z-zc)/(sr2*sig)
           ya = (y+b)/(sr2*betac)                          zb = (z+zc)/(sr2*sig)
                                                          sr2 = sqrt(2.0)
```

Scenario 2.b

2b SLAB Results - Time averaged (tav = 1800. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
-1.51E+01	1.83E+03	3.60E+03	1.51E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
-1.21E+01	1.82E+03	3.60E+03	1.52E+01	5.67E-03	5.31E-03	1.93E-03	5.43E-05	5.42E-08	0.00E+00
-9.05E+00	1.82E+03	3.60E+03	1.53E+01	8.70E-03	8.08E-03	2.93E-03	9.22E-05	1.23E-07	0.00E+00
-6.04E+00	1.81E+03	3.60E+03	1.55E+01	1.10E-02	1.02E-02	3.67E-03	1.28E-04	2.23E-07	0.00E+00
-3.02E+00	1.81E+03	3.60E+03	1.58E+01	1.30E-02	1.19E-02	4.28E-03	1.65E-04	3.66E-07	0.00E+00
-3.81E-06	1.80E+03	3.60E+03	1.61E+01	1.48E-02	1.34E-02	4.80E-03	2.02E-04	5.61E-07	0.00E+00
3.02E+00	1.81E+03	3.60E+03	1.66E+01	1.64E-02	1.47E-02	5.25E-03	2.39E-04	8.13E-07	0.00E+00
6.04E+00	1.81E+03	3.60E+03	1.71E+01	1.79E-02	1.59E-02	5.65E-03	2.77E-04	1.13E-06	5.34E-10
9.05E+00	1.82E+03	3.60E+03	1.77E+01	1.92E-02	1.69E-02	6.00E-03	3.14E-04	1.50E-06	5.75E-10
1.21E+01	1.82E+03	3.60E+03	1.84E+01	2.04E-02	1.78E-02	6.31E-03	3.49E-04	1.92E-06	6.12E-10
1.51E+01	1.83E+03	3.60E+03	1.92E+01	2.15E-02	1.86E-02	6.58E-03	3.83E-04	2.38E-06	1.29E-09
1.53E+01	1.83E+03	3.60E+03	1.93E+01	2.14E-02	1.85E-02	6.56E-03	3.83E-04	2.40E-06	1.29E-09
1.55E+01	1.83E+03	3.60E+03	1.94E+01	2.13E-02	1.85E-02	6.53E-03	3.82E-04	2.41E-06	1.28E-09
1.57E+01	1.83E+03	3.60E+03	1.94E+01	2.13E-02	1.84E-02	6.50E-03	3.82E-04	2.43E-06	1.28E-09
1.60E+01	1.83E+03	3.60E+03	1.95E+01	2.12E-02	1.83E-02	6.47E-03	3.82E-04	2.45E-06	1.27E-09
1.63E+01	1.83E+03	3.60E+03	1.96E+01	2.11E-02	1.82E-02	6.43E-03	3.81E-04	2.48E-06	1.27E-09
1.66E+01	1.83E+03	3.60E+03	1.97E+01	2.09E-02	1.81E-02	6.39E-03	3.80E-04	2.50E-06	1.26E-09
1.70E+01	1.83E+03	3.60E+03	1.98E+01	2.08E-02	1.79E-02	6.34E-03	3.80E-04	2.53E-06	1.88E-09
1.74E+01	1.83E+03	3.60E+03	1.99E+01	2.07E-02	1.78E-02	6.29E-03	3.79E-04	2.56E-06	1.86E-09
1.79E+01	1.84E+03	3.60E+03	2.01E+01	2.05E-02	1.76E-02	6.23E-03	3.78E-04	2.59E-06	1.85E-09
1.84E+01	1.84E+03	3.60E+03	2.02E+01	2.03E-02	1.75E-02	6.16E-03	3.76E-04	2.63E-06	1.83E-09
1.90E+01	1.84E+03	3.60E+03	2.04E+01	2.01E-02	1.73E-02	6.09E-03	3.75E-04	2.67E-06	1.81E-09
1.96E+01	1.84E+03	3.60E+03	2.06E+01	1.99E-02	1.70E-02	6.01E-03	3.73E-04	2.71E-06	1.79E-09
2.04E+01	1.84E+03	3.60E+03	2.09E+01	1.96E-02	1.68E-02	5.92E-03	3.71E-04	2.76E-06	2.36E-09
2.12E+01	1.84E+03	3.60E+03	2.12E+01	1.93E-02	1.65E-02	5.82E-03	3.68E-04	2.81E-06	2.33E-09
2.21E+01	1.84E+03	3.60E+03	2.15E+01	1.90E-02	1.62E-02	5.71E-03	3.65E-04	2.86E-06	2.29E-09
2.32E+01	1.85E+03	3.60E+03	2.18E+01	1.86E-02	1.59E-02	5.59E-03	3.62E-04	2.91E-06	2.81E-09
2.44E+01	1.85E+03	3.60E+03	2.22E+01	1.82E-02	1.55E-02	5.46E-03	3.57E-04	2.97E-06	2.75E-09
2.57E+01	1.85E+03	3.60E+03	2.27E+01	1.78E-02	1.51E-02	5.31E-03	3.52E-04	3.03E-06	2.69E-09
2.72E+01	1.85E+03	3.60E+03	2.32E+01	1.73E-02	1.46E-02	5.15E-03	3.46E-04	3.08E-06	3.14E-09
2.88E+01	1.86E+03	3.60E+03	2.38E+01	1.68E-02	1.41E-02	4.97E-03	3.40E-04	3.13E-06	3.55E-09
3.07E+01	1.86E+03	3.60E+03	2.45E+01	1.62E-02	1.36E-02	4.78E-03	3.32E-04	3.18E-06	3.92E-09
3.28E+01	1.87E+03	3.60E+03	2.53E+01	1.55E-02	1.30E-02	4.57E-03	3.22E-04	3.22E-06	3.76E-09
3.51E+01	1.87E+03	3.60E+03	2.62E+01	1.48E-02	1.24E-02	4.35E-03	3.12E-04	3.25E-06	4.50E-09
3.78E+01	1.88E+03	3.60E+03	2.72E+01	1.41E-02	1.17E-02	4.11E-03	3.00E-04	3.27E-06	4.70E-09
4.07E+01	1.88E+03	3.60E+03	2.83E+01	1.33E-02	1.10E-02	3.86E-03	2.87E-04	3.27E-06	4.85E-09
4.40E+01	1.89E+03	3.60E+03	2.95E+01	1.25E-02	1.03E-02	3.60E-03	2.73E-04	3.26E-06	5.31E-09
4.78E+01	1.90E+03	3.60E+03	3.08E+01	1.16E-02	9.54E-03	3.33E-03	2.58E-04	3.23E-06	5.65E-09
5.19E+01	1.90E+03	3.60E+03	3.23E+01	1.07E-02	8.77E-03	3.06E-03	2.42E-04	3.18E-06	6.21E-09
5.66E+01	1.91E+03	3.60E+03	3.39E+01	9.81E-03	8.00E-03	2.79E-03	2.25E-04	3.12E-06	6.60E-09
6.19E+01	1.92E+03	3.60E+03	3.56E+01	8.93E-03	7.25E-03	2.52E-03	2.08E-04	3.03E-06	6.84E-09
6.78E+01	1.94E+03	3.60E+03	3.75E+01	8.06E-03	6.51E-03	2.26E-03	1.91E-04	2.93E-06	7.43E-09
7.45E+01	1.95E+03	3.60E+03	3.95E+01	7.23E-03	5.81E-03	2.02E-03	1.74E-04	2.82E-06	7.79E-09
8.19E+01	1.96E+03	3.60E+03	4.16E+01	6.45E-03	5.15E-03	1.79E-03	1.58E-04	2.70E-06	8.16E-09
9.03E+01	1.98E+03	3.60E+03	4.38E+01	5.71E-03	4.54E-03	1.57E-03	1.42E-04	2.57E-06	8.50E-09
9.97E+01	2.00E+03	3.60E+03	4.62E+01	5.04E-03	3.98E-03	1.38E-03	1.27E-04	2.44E-06	8.77E-09
1.10E+02	2.02E+03	3.60E+03	4.87E+01	4.42E-03	3.48E-03	1.20E-03	1.14E-04	2.31E-06	9.11E-09
1.22E+02	2.04E+03	3.60E+03	5.14E+01	3.87E-03	3.02E-03	1.04E-03	1.01E-04	2.17E-06	9.47E-09
1.35E+02	2.07E+03	3.60E+03	5.42E+01	3.37E-03	2.62E-03	9.03E-04	8.95E-05	2.04E-06	9.79E-09
1.50E+02	2.10E+03	3.60E+03	5.71E+01	2.93E-03	2.27E-03	7.79E-04	7.91E-05	1.92E-06	1.01E-08
1.67E+02	2.13E+03	3.60E+03	6.02E+01	2.55E-03	1.95E-03	6.71E-04	6.98E-05	1.79E-06	1.04E-08
1.86E+02	2.17E+03	3.60E+03	6.36E+01	2.21E-03	1.68E-03	5.76E-04	6.14E-05	1.67E-06	1.07E-08
2.07E+02	2.21E+03	3.60E+03	6.71E+01	1.91E-03	1.45E-03	4.94E-04	5.40E-05	1.56E-06	1.10E-08
2.30E+02	2.26E+03	3.60E+03	7.08E+01	1.65E-03	1.24E-03	4.24E-04	4.73E-05	1.45E-06	1.12E-08
2.57E+02	2.31E+03	3.60E+03	7.48E+01	1.42E-03	1.06E-03	3.62E-04	4.15E-05	1.34E-06	1.14E-08
2.87E+02	2.37E+03	3.60E+03	7.91E+01	1.23E-03	9.12E-04	3.10E-04	3.63E-05	1.24E-06	1.16E-08
3.20E+02	2.44E+03	3.60E+03	8.37E+01	1.06E-03	7.81E-04	2.65E-04	3.17E-05	1.15E-06	1.17E-08
3.58E+02	2.51E+03	3.60E+03	8.86E+01	9.10E-04	6.68E-04	2.26E-04	2.76E-05	1.06E-06	1.18E-08
4.00E+02	2.60E+03	3.60E+03	9.40E+01	7.82E-04	5.70E-04	1.92E-04	2.40E-05	9.67E-07	1.18E-08
4.47E+02	2.69E+03	3.60E+03	9.97E+01	6.72E-04	4.87E-04	1.64E-04	2.09E-05	8.83E-07	1.17E-08
5.00E+02	2.80E+03	3.60E+03	1.06E+02	5.76E-04	4.15E-04	1.39E-04	1.81E-05	8.03E-07	1.15E-08

```
Problem Input
  idspl =         1       release gas properties
  ncalc =         1
  wms   =   .036460        molecular weight of source gas (kg)              - wms  =  3.6460E-02
  cps   =    795.00        vapor heat capacity, const. p.  (j/kg-k)         - cps  =  7.9500E+02
  tbp   =    329.50        temperature of source gas (k)                    - ts   =  3.2950E+02
  cmed0 =       .00        density of source gas (kg/m3)                    - rhos =  1.3485E+00
  dhe   =   443380.        boiling point temperature                        - tbp  =  3.2950E+02
  cpsl  =    795.00        liquid mass fraction                             - cmed0=  0.0000E+00
  rhosl =   1177.00        liquid heat capacity (j/kg-k)                    - cpsl =  7.9500E+02
  spb   =     -1.00        heat of vaporization (j/kg)                      - dhe  =  4.4338E+05
  spc   =       .00        liquid source density (kg/m3)                    - rhosl=  1.1770E+03
  ts    =    299.75        saturation pressure constant                     - spa  =  5.9008E+00
  qs    =       .50        saturation pressure constant (k)                 - spb  =  1.9443E+03
  as    =    911.00        saturation pressure constant (k)                 - spc  =  0.0000E+00
  tsd   =     3600.
  qtis  =       .00       spill characteristics
  hs    =      1.80
  tav   =   1800.00        spill type                                       - idspl=          1
  xffm  =    500.00        mass source rate (kg/s)                          - qs   =  5.0000E-01
  zp(1) =       .00        continuous source duration (s)                   - tsd  =  3.6000E+03
  zp(2) =       .00        continuous source mass (kg)                      - qtcs =  1.8000E+03
  zp(3) =       .00        instantaneous source mass (kg)                   - qtis =  0.0000E+00
  zp(4) =       .00        source area (m2)                                 - as   =  9.1100E+02
  z0    =   .040000        vertical vapor velocity (m/s)                    - ws   =  4.0701E-04
  za    =      3.00        source half width (m)                            - bs   =  1.5091E+01
  ua    =       .60        source height (m)                                - hs   =  0.0000E+00
  ta    =    299.75        horizontal vapor velocity (m/s)                  - us   =  0.0000E+00
  rh    =     75.00
  stab  =      6.00

field parameters

 concentration averaging time (s)                  - tav  =  1.8000E+03
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  5.0000E+02
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
                                                   - zp(4)=  0.0000E+00

ambient meteorological properties
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02

additional parameters
 sub-step multiplier                              - ncalc =          1
 number of calculational sub-steps                - nssm  =          3
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01

c(x,y,z,t) = cc(x) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)
            t = time (s)                                        yb = (y-b)/(sr2*betac)
                                                               exp = exponential function
          erf = error functon                                   za = (z-zc)/(sr2*sig)
           xa = (x-xc+bx)/(sr2*betax)                           zb = (z+zc)/(sr2*sig)
           xb = (x-xc-bx)/(sr2*betax)                          sr2 = sqrt(2.0)
           ya = (y+b)/(sr2*betac)
```

Scenario 2.c

2c SLAB Results - Time averaged (tav = 600. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
0.00E+00	0.00E+00	1.69E+02	1.03E+01	1.00E+00	1.00E+00	5.89E-01	1.46E-02	1.06E-05	0.00E+00
1.93E-02	3.13E-01	1.69E+02	1.03E+01	1.79E-03	1.69E-03	6.20E-04	1.54E-05	1.11E-08	0.00E+00
5.01E-02	6.66E-01	1.69E+02	1.03E+01	2.60E-03	2.46E-03	8.99E-04	2.23E-05	1.63E-08	0.00E+00
8.99E-02	1.06E+00	1.69E+02	1.03E+01	3.26E-03	3.08E-03	1.13E-03	2.81E-05	2.06E-08	0.00E+00
1.39E-01	1.51E+00	1.69E+02	1.03E+01	3.89E-03	3.67E-03	1.34E-03	3.36E-05	2.48E-08	0.00E+00
1.98E-01	2.02E+00	1.69E+02	1.03E+01	4.53E-03	4.28E-03	1.56E-03	3.92E-05	2.93E-08	0.00E+00
2.67E-01	2.60E+00	1.69E+02	1.03E+01	5.20E-03	4.90E-03	1.79E-03	4.52E-05	3.41E-08	0.00E+00
3.49E-01	3.24E+00	1.69E+02	1.03E+01	5.91E-03	5.57E-03	2.04E-03	5.16E-05	3.95E-08	0.00E+00
4.44E-01	3.98E+00	1.69E+02	1.03E+01	6.67E-03	6.29E-03	2.30E-03	5.86E-05	4.55E-08	0.00E+00
5.54E-01	4.80E+00	1.69E+02	1.04E+01	7.49E-03	7.06E-03	2.58E-03	6.62E-05	5.23E-08	0.00E+00
6.80E-01	5.74E+00	1.69E+02	1.04E+01	8.39E-03	7.90E-03	2.89E-03	7.47E-05	6.03E-08	0.00E+00
8.26E-01	6.79E+00	1.69E+02	1.04E+01	9.37E-03	8.82E-03	3.22E-03	8.41E-05	6.96E-08	0.00E+00
9.91E-01	7.98E+00	1.69E+02	1.04E+01	1.05E-02	9.84E-03	3.59E-03	9.48E-05	8.05E-08	0.00E+00
1.18E+00	9.32E+00	1.69E+02	1.05E+01	1.17E-02	1.10E-02	4.00E-03	1.07E-04	9.36E-08	0.00E+00
1.39E+00	1.08E+01	1.69E+02	1.06E+01	1.30E-02	1.22E-02	4.46E-03	1.21E-04	1.10E-07	0.00E+00
1.64E+00	1.26E+01	1.69E+02	1.07E+01	1.46E-02	1.37E-02	4.98E-03	1.37E-04	1.29E-07	0.00E+00
1.91E+00	1.45E+01	1.69E+02	1.09E+01	1.63E-02	1.53E-02	5.57E-03	1.56E-04	1.53E-07	0.00E+00
2.22E+00	1.67E+01	1.69E+02	1.12E+01	1.83E-02	1.71E-02	6.23E-03	1.77E-04	1.82E-07	0.00E+00
2.56E+00	1.91E+01	1.70E+02	1.16E+01	2.05E-02	1.92E-02	6.98E-03	2.02E-04	2.18E-07	0.00E+00
2.94E+00	2.19E+01	1.79E+02	1.20E+01	2.29E-02	2.14E-02	7.77E-03	2.30E-04	2.62E-07	0.00E+00
3.37E+00	2.51E+01	1.91E+02	1.27E+01	2.53E-02	2.36E-02	8.56E-03	2.59E-04	3.11E-07	0.00E+00
3.85E+00	2.86E+01	2.04E+02	1.35E+01	2.74E-02	2.55E-02	9.26E-03	2.86E-04	3.64E-07	0.00E+00
4.40E+00	3.26E+01	2.18E+02	1.44E+01	2.90E-02	2.70E-02	9.77E-03	3.09E-04	4.16E-07	0.00E+00
5.02E+00	3.72E+01	2.33E+02	1.55E+01	2.99E-02	2.78E-02	1.01E-02	3.25E-04	4.64E-07	0.00E+00
5.74E+00	4.23E+01	2.48E+02	1.68E+01	3.02E-02	2.79E-02	1.01E-02	3.34E-04	5.07E-07	0.00E+00
6.58E+00	4.81E+01	2.63E+02	1.83E+01	2.98E-02	2.75E-02	9.96E-03	3.38E-04	5.44E-07	0.00E+00
7.56E+00	5.46E+01	2.79E+02	1.98E+01	2.91E-02	2.68E-02	9.67E-03	3.36E-04	5.77E-07	0.00E+00
8.72E+00	6.20E+01	2.94E+02	2.16E+01	2.80E-02	2.57E-02	9.27E-03	3.31E-04	6.07E-07	0.00E+00
1.01E+01	7.03E+01	3.11E+02	2.35E+01	2.66E-02	2.44E-02	8.80E-03	3.23E-04	6.32E-07	0.00E+00
1.17E+01	7.97E+01	3.28E+02	2.56E+01	2.51E-02	2.30E-02	8.27E-03	3.12E-04	6.56E-07	0.00E+00
1.36E+01	9.03E+01	3.45E+02	2.79E+01	2.35E-02	2.14E-02	7.71E-03	2.99E-04	6.76E-07	0.00E+00
1.59E+01	1.02E+02	3.64E+02	3.05E+01	2.18E-02	1.98E-02	7.13E-03	2.85E-04	6.94E-07	0.00E+00
1.86E+01	1.16E+02	3.83E+02	3.32E+01	2.01E-02	1.82E-02	6.53E-03	2.69E-04	7.09E-07	0.00E+00
2.17E+01	1.31E+02	4.03E+02	3.63E+01	1.84E-02	1.66E-02	5.94E-03	2.53E-04	7.20E-07	0.00E+00
2.55E+01	1.48E+02	4.24E+02	3.96E+01	1.67E-02	1.50E-02	5.36E-03	2.36E-04	7.29E-07	0.00E+00
3.00E+01	1.68E+02	4.46E+02	4.33E+01	1.50E-02	1.34E-02	4.81E-03	2.19E-04	7.36E-07	0.00E+00
3.55E+01	1.90E+02	4.65E+02	4.73E+01	1.18E-02	1.05E-02	3.74E-03	1.76E-04	6.47E-07	0.00E+00
4.20E+01	2.15E+02	4.82E+02	5.15E+01	8.92E-03	7.92E-03	2.82E-03	1.38E-04	5.54E-07	2.67E-10
4.99E+01	2.43E+02	4.97E+02	5.58E+01	6.67E-03	5.89E-03	2.10E-03	1.06E-04	4.69E-07	2.00E-10
5.95E+01	2.74E+02	5.10E+02	6.03E+01	4.94E-03	4.34E-03	1.54E-03	8.14E-05	3.97E-07	1.48E-10
7.11E+01	3.10E+02	5.23E+02	6.49E+01	3.65E-03	3.19E-03	1.13E-03	6.22E-05	3.37E-07	1.09E-10
8.51E+01	3.51E+02	5.37E+02	6.96E+01	2.69E-03	2.34E-03	8.27E-04	4.77E-05	2.89E-07	1.62E-10
1.02E+02	3.96E+02	5.53E+02	7.45E+01	2.00E-03	1.72E-03	6.07E-04	3.67E-05	2.50E-07	1.80E-10
1.23E+02	4.48E+02	5.71E+02	7.96E+01	1.48E-03	1.27E-03	4.46E-04	2.83E-05	2.18E-07	1.79E-10
1.47E+02	5.06E+02	5.92E+02	8.50E+01	1.11E-03	9.37E-04	3.29E-04	2.20E-05	1.93E-07	2.00E-10
1.77E+02	5.71E+02	6.18E+02	9.06E+01	8.30E-04	6.95E-04	2.44E-04	1.72E-05	1.72E-07	2.01E-10
2.12E+02	6.46E+02	6.47E+02	9.65E+01	6.25E-04	5.18E-04	1.81E-04	1.35E-05	1.55E-07	2.47E-10
2.55E+02	7.29E+02	6.81E+02	1.03E+02	4.71E-04	3.86E-04	1.35E-04	1.06E-05	1.40E-07	2.73E-10
3.05E+02	8.24E+02	7.21E+02	1.10E+02	3.56E-04	2.88E-04	1.00E-04	8.38E-06	1.26E-07	3.06E-10
3.65E+02	9.31E+02	7.67E+02	1.17E+02	2.70E-04	2.15E-04	7.47E-05	6.61E-06	1.14E-07	3.50E-10
4.36E+02	1.05E+03	8.20E+02	1.25E+02	2.04E-04	1.61E-04	5.56E-05	5.20E-06	1.03E-07	3.95E-10
5.20E+02	1.19E+03	8.81E+02	1.33E+02	1.54E-04	1.20E-04	4.14E-05	4.09E-06	9.26E-08	4.38E-10
6.19E+02	1.34E+03	9.50E+02	1.42E+02	1.17E-04	8.95E-05	3.07E-05	3.20E-06	8.24E-08	4.80E-10
7.36E+02	1.52E+03	1.03E+03	1.52E+02	8.79E-05	6.65E-05	2.27E-05	2.49E-06	7.26E-08	5.19E-10
8.74E+02	1.71E+03	1.12E+03	1.63E+02	6.60E-05	4.93E-05	1.68E-05	1.93E-06	6.31E-08	5.46E-10
1.04E+03	1.93E+03	1.22E+03	1.74E+02	4.94E-05	3.64E-05	1.23E-05	1.48E-06	5.41E-08	5.58E-10
1.22E+03	2.18E+03	1.33E+03	1.87E+02	3.68E-05	2.69E-05	9.06E-06	1.13E-06	4.56E-08	5.57E-10
1.45E+03	2.46E+03	1.46E+03	2.02E+02	2.74E-05	1.98E-05	6.63E-06	8.58E-07	3.79E-08	5.38E-10
1.71E+03	2.78E+03	1.61E+03	2.18E+02	2.03E-05	1.45E-05	4.84E-06	6.46E-07	3.10E-08	5.03E-10
2.01E+03	3.14E+03	1.77E+03	2.35E+02	1.49E-05	1.06E-05	3.53E-06	4.84E-07	2.49E-08	4.56E-10
2.36E+03	3.55E+03	1.95E+03	2.55E+02	1.10E-05	7.74E-06	2.57E-06	3.60E-07	1.97E-08	4.02E-10

```
Problem Input
  idspl =         1     release gas properties
  ncalc =         1
  wms   =   .070910      molecular weight of source gas (kg)              - wms  =  7.0910E-02
  cps   =    498.10      vapor heat capacity, const. p.  (j/kg-k)         - cps  =  4.9810E+02
  tbp   =    239.10      temperature of source gas (k)                    - ts   =  2.9975E+02
  cmed0 =       .00      density of source gas (kg/m3)                    - rhos =  2.8830E+00
  dhe   =   287840.      boiling point temperature                        - tbp  =  2.3910E+02
  cpsl  =    926.30      liquid mass fraction                             - cmed0=  0.0000E+00
  rhosl =   1574.00      liquid heat capacity (j/kg-k)                    - cpsl =  9.2630E+02
  spb   =   1978.34      heat of vaporization (j/kg)                      - dhe  =  2.8784E+05
  spc   =    -27.01      liquid source density (kg/m3)                    - rhosl=  1.5740E+03
  ts    =    299.75      saturation pressure constant                     - spa  =  9.3278E+00
  qs    =      1.70      saturation pressure constant (k)                 - spb  =  1.9783E+03
  as    =    426.00      saturation pressure constant (k)                 - spc  = -2.7010E+01
  tsd   =      169.
  qtis  =       .00     spill characteristics
  hs    =      1.80
  tav   =    600.00      spill type                                       - idspl=          1
  xffm  =   2000.00      mass source rate (kg/s)                          - qs   =  1.7000E+00
  zp(1) =       .00      continuous source duration (s)                   - tsd  =  1.6900E+02
  zp(2) =       .00      continuous source mass (kg)                      - qtcs =  2.8730E+02
  zp(3) =       .00      instantaneous source mass (kg)                   - qtis =  0.0000E+00
  zp(4) =       .00      source area (m2)                                 - as   =  4.2600E+02
  z0    =   .040000      vertical vapor velocity (m/s)                    - ws   =  1.3842E-03
  za    =      3.00      source half width (m)                            - bs   =  1.0320E+01
  ua    =       .60      source height (m)                                - hs   =  0.0000E+00
  ta    =    299.75      horizontal vapor velocity (m/s)                  - us   =  0.0000E+00
  rh    =     75.00
  stab  =      6.00

field parameters

 concentration averaging time (s)                  - tav  =  6.0000E+02
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  2.0000E+03
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
                                                   - zp(4)=  0.0000E+00

ambient meteorological properties
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02

additional parameters
 sub-step multiplier                              - ncalc =          1
 number of calculational sub-steps                - nssm  =          3
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01

c(x,y,z,t) = cc(t) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)
            t = time (s)                  yb = (y-b)/(sr2*betac)
                                         exp = exponential function
          erf = error functon             za = (z-zc)/(sr2*sig)
           xa = (x-xc+bx)/(sr2*           zb = (z+zc)/(sr2*sig)
           xb = (x-xc-bx)/(sr2*          sr2 = sqrt(2.0)
           ya = (y+b)/(sr2*betac)
```

Scenario 6.a

6a SLAB Results - Time averaged (tav = 1800. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
-7.54E+00	1.81E+03	3.60E+03	7.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
-6.03E+00	1.81E+03	3.60E+03	7.60E+00	3.74E-03	3.50E-03	1.28E-03	3.61E-05	3.65E-08	0.00E+00
-4.52E+00	1.81E+03	3.60E+03	7.66E+00	5.48E-03	5.08E-03	1.84E-03	5.85E-05	7.95E-08	0.00E+00
-3.02E+00	1.81E+03	3.60E+03	7.74E+00	6.73E-03	6.19E-03	2.23E-03	7.89E-05	1.41E-07	0.00E+00
-1.51E+00	1.80E+03	3.60E+03	7.84E+00	7.75E-03	7.06E-03	2.54E-03	9.90E-05	2.26E-07	0.00E+00
9.54E-07	1.80E+03	3.60E+03	7.96E+00	8.63E-03	7.79E-03	2.79E-03	1.19E-04	3.42E-07	0.00E+00
1.51E+00	1.80E+03	3.60E+03	8.11E+00	9.41E-03	8.41E-03	3.00E-03	1.39E-04	4.91E-07	0.00E+00
3.02E+00	1.81E+03	3.60E+03	8.27E+00	1.01E-02	8.96E-03	3.19E-03	1.59E-04	6.77E-07	3.03E-10
4.52E+00	1.81E+03	3.60E+03	8.47E+00	1.08E-02	9.43E-03	3.35E-03	1.79E-04	9.01E-07	3.22E-10
6.03E+00	1.81E+03	3.60E+03	8.68E+00	1.13E-02	9.86E-03	3.49E-03	1.98E-04	1.16E-06	6.80E-10
7.54E+00	1.81E+03	3.60E+03	8.93E+00	1.19E-02	1.02E-02	3.61E-03	2.17E-04	1.46E-06	1.07E-09
7.64E+00	1.81E+03	3.60E+03	8.95E+00	1.18E-02	1.02E-02	3.60E-03	2.17E-04	1.47E-06	1.07E-09
7.76E+00	1.81E+03	3.60E+03	8.97E+00	1.18E-02	1.01E-02	3.58E-03	2.16E-04	1.48E-06	1.06E-09
7.90E+00	1.82E+03	3.60E+03	8.99E+00	1.17E-02	1.01E-02	3.56E-03	2.16E-04	1.49E-06	1.06E-09
8.05E+00	1.82E+03	3.60E+03	9.02E+00	1.16E-02	1.00E-02	3.53E-03	2.16E-04	1.51E-06	1.05E-09
8.23E+00	1.82E+03	3.60E+03	9.05E+00	1.16E-02	9.93E-03	3.50E-03	2.15E-04	1.53E-06	1.04E-09
8.43E+00	1.82E+03	3.60E+03	9.08E+00	1.15E-02	9.85E-03	3.47E-03	2.15E-04	1.55E-06	1.04E-09
8.66E+00	1.82E+03	3.60E+03	9.12E+00	1.14E-02	9.75E-03	3.44E-03	2.14E-04	1.58E-06	1.03E-09
8.92E+00	1.82E+03	3.60E+03	9.17E+00	1.13E-02	9.65E-03	3.40E-03	2.14E-04	1.60E-06	1.36E-09
9.21E+00	1.82E+03	3.60E+03	9.23E+00	1.12E-02	9.53E-03	3.36E-03	2.13E-04	1.63E-06	1.34E-09
9.55E+00	1.82E+03	3.60E+03	9.29E+00	1.10E-02	9.39E-03	3.31E-03	2.12E-04	1.67E-06	1.33E-09
9.93E+00	1.82E+03	3.60E+03	9.36E+00	1.09E-02	9.25E-03	3.26E-03	2.11E-04	1.71E-06	1.64E-09
1.04E+01	1.82E+03	3.60E+03	9.45E+00	1.07E-02	9.08E-03	3.20E-03	2.10E-04	1.75E-06	1.61E-09
1.09E+01	1.82E+03	3.60E+03	9.55E+00	1.05E-02	8.90E-03	3.13E-03	2.08E-04	1.80E-06	1.90E-09
1.14E+01	1.82E+03	3.60E+03	9.66E+00	1.03E-02	8.70E-03	3.06E-03	2.06E-04	1.85E-06	1.87E-09
1.21E+01	1.82E+03	3.60E+03	9.79E+00	1.01E-02	8.48E-03	2.98E-03	2.04E-04	1.90E-06	2.13E-09
1.28E+01	1.82E+03	3.60E+03	9.95E+00	9.80E-03	8.23E-03	2.89E-03	2.02E-04	1.97E-06	2.37E-09
1.36E+01	1.83E+03	3.60E+03	1.01E+01	9.52E-03	7.96E-03	2.79E-03	1.99E-04	2.03E-06	2.59E-09
1.46E+01	1.83E+03	3.60E+03	1.03E+01	9.21E-03	7.67E-03	2.69E-03	1.95E-04	2.10E-06	2.79E-09
1.57E+01	1.83E+03	3.60E+03	1.06E+01	8.87E-03	7.36E-03	2.58E-03	1.91E-04	2.17E-06	3.23E-09
1.69E+01	1.83E+03	3.60E+03	1.09E+01	8.51E-03	7.02E-03	2.45E-03	1.87E-04	2.24E-06	3.62E-09
1.83E+01	1.84E+03	3.60E+03	1.12E+01	8.11E-03	6.66E-03	2.33E-03	1.81E-04	2.31E-06	4.20E-09
1.99E+01	1.84E+03	3.60E+03	1.15E+01	7.69E-03	6.28E-03	2.19E-03	1.75E-04	2.38E-06	4.93E-09
2.17E+01	1.84E+03	3.60E+03	1.20E+01	7.24E-03	5.88E-03	2.05E-03	1.68E-04	2.44E-06	5.55E-09
2.37E+01	1.85E+03	3.60E+03	1.25E+01	6.78E-03	5.47E-03	1.90E-03	1.61E-04	2.49E-06	6.24E-09
2.61E+01	1.85E+03	3.60E+03	1.30E+01	6.29E-03	5.05E-03	1.75E-03	1.52E-04	2.52E-06	7.18E-09
2.88E+01	1.86E+03	3.60E+03	1.36E+01	5.80E-03	4.62E-03	1.60E-03	1.43E-04	2.54E-06	8.07E-09
3.18E+01	1.86E+03	3.60E+03	1.43E+01	5.30E-03	4.19E-03	1.45E-03	1.33E-04	2.54E-06	9.06E-09
3.53E+01	1.87E+03	3.60E+03	1.51E+01	4.80E-03	3.78E-03	1.30E-03	1.23E-04	2.52E-06	1.01E-08
3.92E+01	1.88E+03	3.60E+03	1.60E+01	4.32E-03	3.37E-03	1.16E-03	1.13E-04	2.48E-06	1.11E-08
4.37E+01	1.88E+03	3.60E+03	1.70E+01	3.85E-03	2.98E-03	1.03E-03	1.03E-04	2.42E-06	1.22E-08
4.88E+01	1.89E+03	3.60E+03	1.80E+01	3.41E-03	2.62E-03	9.00E-04	9.29E-05	2.34E-06	1.31E-08
5.46E+01	1.90E+03	3.60E+03	1.92E+01	3.00E-03	2.29E-03	7.84E-04	8.32E-05	2.25E-06	1.41E-08
6.12E+01	1.92E+03	3.60E+03	2.05E+01	2.62E-03	1.98E-03	6.77E-04	7.40E-05	2.14E-06	1.51E-08
6.88E+01	1.93E+03	3.60E+03	2.19E+01	2.27E-03	1.71E-03	5.82E-04	6.54E-05	2.02E-06	1.59E-08
7.73E+01	1.95E+03	3.60E+03	2.33E+01	1.96E-03	1.46E-03	4.98E-04	5.74E-05	1.90E-06	1.66E-08
8.71E+01	1.97E+03	3.60E+03	2.50E+01	1.69E-03	1.25E-03	4.24E-04	5.01E-05	1.77E-06	1.72E-08
9.82E+01	1.99E+03	3.60E+03	2.67E+01	1.44E-03	1.06E-03	3.59E-04	4.36E-05	1.63E-06	1.76E-08
1.11E+02	2.01E+03	3.60E+03	2.86E+01	1.23E-03	9.00E-04	3.04E-04	3.77E-05	1.50E-06	1.79E-08
1.25E+02	2.04E+03	3.60E+03	3.07E+01	1.05E-03	7.60E-04	2.56E-04	3.25E-05	1.37E-06	1.79E-08
1.42E+02	2.07E+03	3.60E+03	3.30E+01	8.88E-04	6.40E-04	2.15E-04	2.79E-05	1.24E-06	1.79E-08
1.60E+02	2.11E+03	3.60E+03	3.54E+01	7.51E-04	5.38E-04	1.80E-04	2.39E-05	1.12E-06	1.76E-08
1.82E+02	2.15E+03	3.60E+03	3.81E+01	6.34E-04	4.52E-04	1.51E-04	2.03E-05	1.00E-06	1.71E-08
2.06E+02	2.19E+03	3.60E+03	4.11E+01	5.33E-04	3.78E-04	1.26E-04	1.73E-05	8.92E-07	1.64E-08
2.33E+02	2.25E+03	3.60E+03	4.43E+01	4.48E-04	3.16E-04	1.05E-04	1.46E-05	7.88E-07	1.56E-08
2.65E+02	2.31E+03	3.60E+03	4.79E+01	3.75E-04	2.64E-04	8.73E-05	1.24E-05	6.92E-07	1.47E-08
3.00E+02	2.38E+03	3.60E+03	5.19E+01	3.14E-04	2.20E-04	7.26E-05	1.04E-05	6.04E-07	1.36E-08
3.41E+02	2.45E+03	3.60E+03	5.62E+01	2.62E-04	1.83E-04	6.02E-05	8.73E-06	5.23E-07	1.25E-08
3.87E+02	2.54E+03	3.60E+03	6.11E+01	2.18E-04	1.52E-04	4.99E-05	7.30E-06	4.51E-07	1.13E-08
4.40E+02	2.64E+03	3.60E+03	6.64E+01	1.81E-04	1.26E-04	4.13E-05	6.09E-06	3.86E-07	1.02E-08
5.00E+02	2.76E+03	3.60E+03	7.24E+01	1.50E-04	1.04E-04	3.41E-05	5.07E-06	3.28E-07	9.00E-09

Problem Input

```
  idspl =         1     release gas properties
  ncalc =         1
  wms   =   .036460      molecular weight of source gas (kg)              - wms  =  3.6460E-02
  cps   =    795.00      vapor heat capacity, const. p.  (j/kg-k)         - cps  =  7.9500E+02
  tbp   =    329.50      temperature of source gas (k)                    - ts   =  3.2950E+02
  cmed0 =       .00      density of source gas (kg/m3)                    - rhos =  1.3485E+00
  dhe   =   443380.      boiling point temperature                        - tbp  =  3.2950E+02
  cpsl  =    795.00      liquid mass fraction                             - cmed0=  0.0000E+00
  rhosl =   1177.00      liquid heat capacity (j/kg-k)                    - cpsl =  7.9500E+02
  spb   =     -1.00      heat of vaporization (j/kg)                      - dhe  =  4.4338E+05
  spc   =       .00      liquid source density (kg/m3)                    - rhosl=  1.1770E+03
  ts    =    299.75      saturation pressure constant                     - spa  =  5.9008E+00
  qs    =       .10      saturation pressure constant (k)                 - spb  =  1.9443E+03
  as    =    227.40      saturation pressure constant (k)                 - spc  =  0.0000E+00
  tsd   =     3600.
  qtis  =       .00     spill characteristics
  hs    =      1.00
  tav   =   1800.00      spill type                                       - idspl=          1
  xffm  =    500.00      mass source rate (kg/s)                          - qs   =  1.0000E-01
  zp(1) =       .00      continuous source duration (s)                   - tsd  =  3.6000E+03
  zp(2) =       .00      continuous source mass (kg)                      - qtcs =  3.6000E+02
  zp(3) =       .00      instantaneous source mass (kg)                   - qtis =  0.0000E+00
  zp(4) =       .00      source area (m2)                                 - as   =  2.2740E+02
  z0    =   .040000      vertical vapor velocity (m/s)                    - ws   =  3.2611E-04
  za    =      3.00      source half width (m)                            - bs   =  7.5399E+00
  ua    =       .60      source height (m)                                - hs   =  0.0000E+00
  ta    =    299.75      horizontal vapor velocity (m/s)                  - us   =  0.0000E+00
  rh    =     75.00
  stab  =      6.00
```

field parameters

```
 concentration averaging time (s)                  - tav  =  1.8000E+03
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  5.0000E+02
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
```

ambient meteorological properties

```
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02
```

additional parameters

```
 sub-step multiplier                              - ncalc =          1
 number of calculational sub-steps                - nssm  =          3
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01
```

```
   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)
            t = time (s)
          erf = error functon                    exp = exponential function
           xa = (x-xc+bx)/(sr2*betax)             za = (z-zc)/(sr2*sig)
           xb = (x-xc-bx)/(sr2*betax)             zb = (z+zc)/(sr2*sig)
           ya = (y+b)/(sr2*betac)                sr2 = sqrt(2.0)
           yb = (y-b)/(sr2*betac)
```

Scenario 6.b

6b SLAB Results - Time averaged (tav = 600. s) volume concentration: concentration in the z = .00 plane"

Downwind distance x (m)	Time of maximum concentration (s)	Cloud Duration (s)	Effective Half Width bbc (m)	Average Concen at y=0 (volume frac)	Average Concen at y=0.5*bbc (volume frac)	Average Concen at y=1*bbc (volume frac)	Average Concen at y=1.5*bbc (volume frac)	Average Concen at y=2*bbc (volume frac)	Average Concen at y=2.5*bbc (volume frac)
0.00E+00	0.00E+00	1.14E+02	7.60E+00	1.00E+00	1.00E+00	5.89E-01	1.46E-02	1.06E-05	0.00E+00
1.92E-02	3.12E-01	1.14E+02	7.60E+00	1.38E-03	1.30E-03	4.77E-04	1.18E-05	8.60E-09	0.00E+00
4.97E-02	6.62E-01	1.14E+02	7.60E+00	2.01E-03	1.89E-03	6.93E-04	1.72E-05	1.26E-08	0.00E+00
8.87E-02	1.06E+00	1.14E+02	7.60E+00	2.52E-03	2.38E-03	8.70E-04	2.17E-05	1.60E-08	0.00E+00
1.36E-01	1.50E+00	1.14E+02	7.60E+00	3.01E-03	2.84E-03	1.04E-03	2.60E-05	1.94E-08	0.00E+00
1.93E-01	1.99E+00	1.14E+02	7.61E+00	3.50E-03	3.30E-03	1.21E-03	3.04E-05	2.29E-08	0.00E+00
2.60E-01	2.55E+00	1.14E+02	7.61E+00	4.01E-03	3.78E-03	1.38E-03	3.50E-05	2.68E-08	0.00E+00
3.38E-01	3.18E+00	1.14E+02	7.62E+00	4.55E-03	4.29E-03	1.57E-03	4.00E-05	3.12E-08	0.00E+00
4.28E-01	3.88E+00	1.14E+02	7.63E+00	5.13E-03	4.84E-03	1.77E-03	4.54E-05	3.61E-08	0.00E+00
5.32E-01	4.67E+00	1.14E+02	7.64E+00	5.76E-03	5.42E-03	1.98E-03	5.14E-05	4.17E-08	0.00E+00
6.50E-01	5.56E+00	1.14E+02	7.67E+00	6.44E-03	6.06E-03	2.21E-03	5.80E-05	4.84E-08	0.00E+00
7.85E-01	6.55E+00	1.14E+02	7.70E+00	7.19E-03	6.76E-03	2.47E-03	6.55E-05	5.64E-08	0.00E+00
9.38E-01	7.67E+00	1.14E+02	7.75E+00	8.02E-03	7.54E-03	2.75E-03	7.39E-05	6.58E-08	0.00E+00
1.11E+00	8.92E+00	1.15E+02	7.82E+00	8.95E-03	8.40E-03	3.06E-03	8.35E-05	7.71E-08	0.00E+00
1.31E+00	1.03E+01	1.17E+02	7.93E+00	1.00E-02	9.38E-03	3.42E-03	9.47E-05	9.12E-08	0.00E+00
1.52E+00	1.19E+01	1.20E+02	8.08E+00	1.12E-02	1.05E-02	3.82E-03	1.08E-04	1.08E-07	0.00E+00
1.77E+00	1.37E+01	1.25E+02	8.28E+00	1.25E-02	1.17E-02	4.27E-03	1.23E-04	1.30E-07	0.00E+00
2.04E+00	1.57E+01	1.31E+02	8.56E+00	1.40E-02	1.31E-02	4.77E-03	1.40E-04	1.56E-07	0.00E+00
2.34E+00	1.79E+01	1.39E+02	8.93E+00	1.57E-02	1.46E-02	5.30E-03	1.59E-04	1.87E-07	0.00E+00
2.68E+00	2.05E+01	1.48E+02	9.40E+00	1.73E-02	1.61E-02	5.84E-03	1.79E-04	2.23E-07	0.00E+00
3.05E+00	2.33E+01	1.58E+02	9.99E+00	1.87E-02	1.74E-02	6.31E-03	1.98E-04	2.61E-07	0.00E+00
3.47E+00	2.65E+01	1.70E+02	1.07E+01	1.98E-02	1.84E-02	6.65E-03	2.14E-04	2.99E-07	0.00E+00
3.95E+00	3.00E+01	1.81E+02	1.15E+01	2.04E-02	1.89E-02	6.83E-03	2.24E-04	3.34E-07	0.00E+00
4.55E+00	3.40E+01	1.90E+02	1.25E+01	1.78E-02	1.65E-02	5.96E-03	2.01E-04	3.18E-07	0.00E+00
5.26E+00	3.85E+01	1.98E+02	1.35E+01	1.50E-02	1.38E-02	4.98E-03	1.72E-04	2.90E-07	0.00E+00
6.09E+00	4.36E+01	2.03E+02	1.45E+01	1.22E-02	1.12E-02	4.05E-03	1.44E-04	2.59E-07	0.00E+00
7.08E+00	4.93E+01	2.08E+02	1.56E+01	9.87E-03	9.05E-03	3.26E-03	1.19E-04	2.30E-07	0.00E+00
8.25E+00	5.56E+01	2.13E+02	1.68E+01	7.93E-03	7.25E-03	2.61E-03	9.82E-05	2.05E-07	0.00E+00
9.65E+00	6.28E+01	2.17E+02	1.79E+01	6.32E-03	5.76E-03	2.07E-03	8.05E-05	1.82E-07	0.00E+00
1.13E+01	7.08E+01	2.21E+02	1.92E+01	5.00E-03	4.54E-03	1.63E-03	6.56E-05	1.62E-07	0.00E+00
1.33E+01	7.98E+01	2.24E+02	2.04E+01	3.93E-03	3.55E-03	1.27E-03	5.32E-05	1.45E-07	0.00E+00
1.57E+01	9.00E+01	2.28E+02	2.17E+01	3.07E-03	2.77E-03	9.90E-04	4.30E-05	1.29E-07	0.00E+00
1.86E+01	1.01E+02	2.31E+02	2.30E+01	2.39E-03	2.14E-03	7.67E-04	3.48E-05	1.16E-07	0.00E+00
2.20E+01	1.14E+02	2.35E+02	2.44E+01	1.86E-03	1.66E-03	5.92E-04	2.81E-05	1.06E-07	0.00E+00
2.61E+01	1.28E+02	2.39E+02	2.59E+01	1.45E-03	1.28E-03	4.57E-04	2.28E-05	9.67E-08	4.34E-11
3.10E+01	1.45E+02	2.45E+02	2.74E+01	1.13E-03	9.93E-04	3.53E-04	1.85E-05	8.95E-08	3.38E-11
3.68E+01	1.63E+02	2.51E+02	2.90E+01	8.83E-04	7.70E-04	2.73E-04	1.52E-05	8.37E-08	2.65E-11
4.38E+01	1.83E+02	2.58E+02	3.06E+01	6.92E-04	5.99E-04	2.12E-04	1.24E-05	7.91E-08	4.16E-11
5.21E+01	2.06E+02	2.67E+02	3.24E+01	5.45E-04	4.67E-04	1.65E-04	1.03E-05	7.55E-08	4.92E-11
6.19E+01	2.31E+02	2.77E+02	3.43E+01	4.31E-04	3.65E-04	1.29E-04	8.51E-06	7.27E-08	6.50E-11
7.36E+01	2.60E+02	2.89E+02	3.63E+01	3.42E-04	2.87E-04	1.01E-04	7.09E-06	7.05E-08	8.29E-11
8.73E+01	2.93E+02	3.02E+02	3.84E+01	2.73E-04	2.26E-04	7.91E-05	5.93E-06	6.88E-08	1.08E-10
1.04E+02	3.29E+02	3.18E+02	4.06E+01	2.19E-04	1.79E-04	6.23E-05	4.98E-06	6.74E-08	1.34E-10
1.23E+02	3.70E+02	3.36E+02	4.31E+01	1.76E-04	1.42E-04	4.92E-05	4.19E-06	6.61E-08	1.73E-10
1.45E+02	4.15E+02	3.57E+02	4.57E+01	1.42E-04	1.13E-04	3.90E-05	3.53E-06	6.47E-08	2.15E-10
1.71E+02	4.67E+02	3.80E+02	4.86E+01	1.14E-04	8.95E-05	3.09E-05	2.97E-06	6.32E-08	2.69E-10
2.02E+02	5.25E+02	4.07E+02	5.17E+01	9.24E-05	7.13E-05	2.45E-05	2.50E-06	6.12E-08	3.29E-10
2.38E+02	5.89E+02	4.37E+02	5.51E+01	7.46E-05	5.67E-05	1.94E-05	2.09E-06	5.88E-08	3.95E-10
2.80E+02	6.62E+02	4.72E+02	5.88E+01	6.00E-05	4.49E-05	1.53E-05	1.74E-06	5.57E-08	4.63E-10
3.30E+02	7.44E+02	5.10E+02	6.30E+01	4.81E-05	3.55E-05	1.20E-05	1.44E-06	5.20E-08	5.28E-10
3.87E+02	8.36E+02	5.54E+02	6.77E+01	3.83E-05	2.79E-05	9.41E-06	1.18E-06	4.76E-08	5.82E-10
4.53E+02	9.39E+02	6.03E+02	7.30E+01	3.03E-05	2.18E-05	7.32E-06	9.51E-07	4.26E-08	6.17E-10
5.31E+02	1.05E+03	6.58E+02	7.87E+01	2.38E-05	1.70E-05	5.67E-06	7.61E-07	3.71E-08	6.19E-10
6.21E+02	1.19E+03	7.20E+02	8.50E+01	1.85E-05	1.31E-05	4.36E-06	6.02E-07	3.16E-08	5.97E-10
7.25E+02	1.33E+03	7.89E+02	9.21E+01	1.43E-05	1.01E-05	3.33E-06	4.71E-07	2.63E-08	5.56E-10
8.46E+02	1.50E+03	8.66E+02	1.00E+02	1.10E-05	7.66E-06	2.53E-06	3.64E-07	2.15E-08	4.98E-10
9.87E+02	1.68E+03	9.53E+02	1.09E+02	8.31E-06	5.79E-06	1.90E-06	2.78E-07	1.72E-08	4.32E-10
1.15E+03	1.89E+03	1.05E+03	1.19E+02	6.26E-06	4.34E-06	1.42E-06	2.11E-07	1.35E-08	3.63E-10
1.34E+03	2.12E+03	1.16E+03	1.31E+02	4.68E-06	3.24E-06	1.06E-06	1.58E-07	1.05E-08	2.97E-10
1.55E+03	2.38E+03	1.28E+03	1.43E+02	3.48E-06	2.40E-06	7.84E-07	1.18E-07	7.98E-09	2.37E-10
1.80E+03	2.67E+03	1.41E+03	1.58E+02	2.57E-06	1.77E-06	5.78E-07	8.74E-08	6.02E-09	1.85E-10

```
Problem Input
  idspl =         1    release gas properties
  ncalc =         1
  wms   =   .070910     molecular weight of source gas (kg)              - wms  =  7.0910E-02
  cps   =    498.10     vapor heat capacity, const. p.  (j/kg-k)         - cps  =  4.9810E+02
  tbp   =    239.10     temperature of source gas (k)                    - ts   =  2.9975E+02
  cmed0 =       .00     density of source gas (kg/m3)                    - rhos =  2.8830E+00
  dhe   =   287840.     boiling point temperature                        - tbp  =  2.3910E+02
  cpsl  =    926.30     liquid mass fraction                             - cmed0=  0.0000E+00
  rhosl =   1574.00     liquid heat capacity (j/kg-k)                    - cpsl =  9.2630E+02
  spb   =   1978.34     heat of vaporization (j/kg)                      - dhe  =  2.8784E+05
  spc   =    -27.01     liquid source density (kg/m3)                    - rhosl=  1.5740E+03
  ts    =    299.75     saturation pressure constant                     - spa  =  9.3278E+00
  qs    =       .96     saturation pressure constant (k)                 - spb  =  1.9783E+03
  as    =    231.00     saturation pressure constant (k)                 - spc  = -2.7010E+01
  tsd   =       30.
  qtis  =       .00    spill characteristics
  hs    =      1.00
  tav   =    600.00     spill type                                       - idspl=          1
  xffm  =   1500.00     mass source rate (kg/s)                          - qs   =  9.6000E-01
  zp(1) =       .00     continuous source duration (s)                   - tsd  =  3.0000E+01
  zp(2) =       .00     continuous source mass (kg)                      - qtcs =  2.8800E+01
  zp(3) =       .00     instantaneous source mass (kg)                   - qtis =  0.0000E+00
  zp(4) =       .00     source area (m2)                                 - as   =  2.3100E+02
  z0    =   .040000     vertical vapor velocity (m/s)                    - ws   =  1.4415E-03
  za    =      3.00     source half width (m)                            - bs   =  7.5993E+00
  ua    =       .60     source height (m)                                - hs   =  0.0000E+00
  ta    =    299.75     horizontal vapor velocity (m/s)                  - us   =  0.0000E+00
  rh    =     75.00
  stab  =      6.00

field parameters

 concentration averaging time (s)                  - tav  =  6.0000E+02
 mixing layer height (m)                           - hmx  =  2.6000E+02
 maximum downwind distrace (m)                     - xffm =  1.5000E+03
 concentration measurement height (m)              - zp(1)=  0.0000E+00
                                                   - zp(2)=  0.0000E+00
                                                   - zp(3)=  0.0000E+00
                                                   - zp(4)=  0.0000E+00

ambient meteorological properties
 molecular weight of ambient air (kg)             - wmae  =  2.8662E-02
 heat capacity of ambient air at const p. (j/kg-k)- cpaa  =  1.0203E+03
 density of ambient air (kg/m3)                   - rhoa  =  1.1653E+00
 ambient measurement height (m)                   - za    =  3.0000E+00
 ambient atmospheric pressure (pa=n/m2=j/m3)      - pa    =  1.0133E+05
 ambient wind speed (m/s)                         - ua    =  6.0000E-01
 ambient temperature (k)                          - ta    =  2.9975E+02
 relative humidity (percent)                      - rh    =  7.5000E+01
 ambient friction velocity (m/s)                  - uastr =  4.3107E-02
 atmospheric stability class value                - stab  =  6.0000E+00
 inverse monin-obukhov length (1/m)               - ala   =  6.6866E-02
 surface roughness height (m)                     - z0    =  4.0000E-02

additional parameters
 sub-step multiplier                              - ncalc =          1
 number of calculational sub-steps                - nssm  =          3
 acceleration of gravity (m/s2)                   - grav  =  9.8067E+00
 gas constant (j/mol- k)                          - rr    =  8.3143E+00
 von karman constant                              - xk    =  4.1000E-01

c(x,y,z,t) = cc(t) * (erf(xa)-erf(xb)) * (erf(ya)-erf(yb)) * (exp(-za*za)+exp(-zb*zb))

   c(x,y,z,t) = concentration (volume fraction) at (x,y,z,t)
            x = downwind distance (m)
            y = crosswind horizontal distance (m)
            z = height (m)
            t = time (s)                          yb = (y-b)/(sr2*betac)
                                                 exp = exponential function
          erf = error functon                     za = (z-zc)/(sr2*sig)
           xa = (x-xc+bx)/(sr2*betax)             zb = (z+zc)/(sr2*sig)
           xb = (x-xc-bx)/(sr2*betax)            sr2 = sqrt(2.0)
           ya = (y+b)/(sr2*betac)
```

BUSINESS CONFIDENTIAL

REPORT AND FINDINGS FOR QUALITATIVE RISK ASSESSMENT AND SAFETY CASE SUPPORT FOR THE CARISAL CHLOR-ALKALI PLANT POINT LISAS INDUSTRIAL ESTATE, COUVA, TRINIDAD AND TOBAGO W.I.

November 24, 2008

ABS CONSULTING Review Team

Charles Rogers

Sanseeahray Burnett

Chengtao Wei

NOTICE

This report was prepared by ABSG Consulting Inc. (ABS Consulting) at the direction of CariSal Limited solely for use by CariSal Limited and for the benefit of CariSal Limited calcium chloride facility at a site on the new Point Lisas Industrial Estate in Couva, Trinidad & Tobago. Neither ABS Consulting or CariSal Limited, nor any person acting on their behalf, makes any warranty, express or implied, or assumes any liability to any third party with respect to the use of any information or methods disclosed in this report. Any third-party recipient of this report, by acceptance or use of this report, releases ABS Consulting and CariSal Limited from liability for any direct, indirect, consequential, or special loss or damage, whether arising in contract, tort (including negligence), or otherwise.

ABS Consulting and its employees, subcontractors, consultants, and other assigns cannot, individually or collectively, predict what will happen in the future. We will make a reasonable effort, based on the information supplied to us and scope of work defined by CariSal Limited, to help CariSal Limited identify the causes associated with the QRA services at the CariSal Limited Houston offices in December 2008. If the suggestions of the QRA are followed, the likelihood and/or consequences of potential accidents occurring in the plant should decrease. However, there are potential accidents that will not be considered during this analysis; even if the suggestions are followed, accidents may still occur. Moreover, the actions associated with implementing the recommendations of the QRA team may subject CariSal Limited employees or their assigns to unforeseen hazards. Therefore, CariSal Limited personnel should carefully review the recommendations before implementing them to determine whether they are in CariSal Limited's best interest. ABS Consulting accepts no liability for any regulatory impact or accidents that may occur at any of CariSal Limited's facilities.

INTRODUCTION

ABSG Consulting Inc. (ABS Consulting) provided Qualitative Risk Assessment (QRA) and services in the development of the Health, Safety and Environment (HSE) Case addressing the CariSal Limited calcium chloride facility at a site on the new Point Lisas Industrial Estate in Couva, Trinidad & Tobago. The Facility consists of a Chlor-Alkali plant, calcium chloride unit, necessary utilities and administration facilities. The Phase 1 qualitative risk assessment included a review of the previous HAZID/HAZOP registers and other quantitative assessments and analysis studies undertaken to date. A summary of the previously agreed to Phase 1 work summary and scope of work is given below:

- ***WORK SUMMARY***

  Risk Assessment review and LOPA analysis of the five (5) Accident Scenarios from the previously completed HAZID for the proposed Chlor-Alkali plant and additional hazard scenarios as deemed necessary to complete a holistic review of the subject process.

- ***SCOPE OF WORK***

  This process will formally document and analyze the five (5) accident scenarios found in the CariSal EIA document (EIA, Appendix C, Table ES-7, page C-16), and to assess how the key systems should behave in order to mitigate the hazards for the CariSal Chlor-Alkali plant. The THESIS BowTie analysis will examine all the major hazards related to the operation of the facilities. It will further examine those systems that prevent those hazards from occurring, and it will identify those systems that mitigate the effects of a hazard. This leads to the register of SCEs (Safety Critical Equipment), which will be an important aspect of the safety management system.

THESIS SOFTWARE DESCRIPTION AND PROCESS METHODOLGY

THESIS was originally conceived and developed in response to a primary need for enhanced Safety Management Systems, identified by Cullen. A development agreement and philosophy was signed in 1997, which set out the future strategy of the tool. THESIS software has a sustainable track record of world usage with major Oil, Gas, Petrochemical and trading businesses.

THESIS Version 5.0 is the latest release of this market leading tool and it contains hugely improved program functionality and user friendliness, as well as many additional features, including a semi-quantitative LOPA module. There are various uses and benefits of the applying the THESIS software.

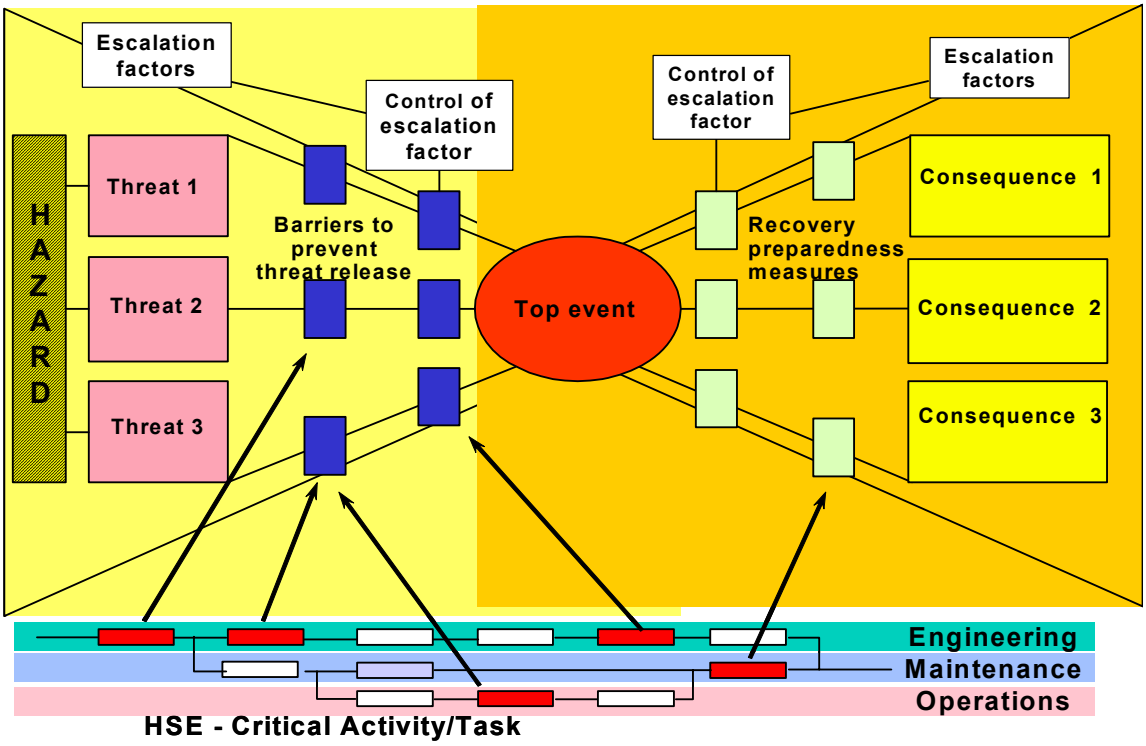
THESIS assists in the analysis and management of hazards and risks, and their controls, by providing a tool which:

- Documents the risk analysis in a systematic manner that makes the control of hazards easier for personnel to understand.
- Links the hazards, controls, etc to safety critical activities and tasks via 'Bow-Ties' thus ensuring that the controls identified are linked to the company's processes and to each individual's responsibilities.
- Provides reports which can form part of a Formal Safety Assessment, e.g. HSE Case, which can be used for communication to those personnel responsible for safety critical tasks.
- Provides an essential source of risk management information – a "corporate memory" – to prevent losses occurring or re-occurring.
- Documents all areas where shortfalls have been identified and corrective action is required, and assigns responsibilities for completion of the actions.
- Supports audits of HSE Management Systems.
- Facilitates a continuous improvement process for risk management.
- Promotes visibility and awareness of hazards, risks and HSE Management.
- Facilitates management of change and demonstrates compliance.

The Bow-Tie Methodology

Bow-Ties are a graphical display of the relationship between the various components that result from the Hazard and Effects Management Process (HEMP).

They depict the relationship between hazards, threats, barriers, escalation factors, controls, consequences, recovery preparedness measures and safety or HSE critical tasks, as illustrated in the figure below.



The advantage of adopting the Bow-Tie approach is that it is an extremely powerful representation of a hazard analysis and is readily understood at all levels in an organisation.

CARISAL HAZID PROCESS

Development of CariSal Field BowTie

Through workshop/discussions the hazards were systematically extracted from the Risk Register of the previous HAZID/HAZOP studies and analyses against specific scenarios with the objective of identifying the following components:

- Hazard Assessment against industry best practice standards
- Postulated Top Level Events
- Consequences

At this stage the risk profile of the consequential events were be developed in accordance with the Risk Matrix to select those major hazards which require a detailed THESIS analysis, in terms of the initial risk profile. The outcomes of the previous QRAs completed were used to determine those hazards for consideration and to pre-populate the risk ranking, so far as possible.

The outcome of this review did:

- Concur with those scenarios previously captured
- Suggest additional scenarios
- Suggest a reduction in scenarios

The postulated hazards were then assessed in turn with the high, and subject to agreement, possibly some medium risk hazards being developed to the following levels:

- Threats
- Controls/Barriers/Recovery Preparedness Measures
- Escalation Factors
- Escalation Factor Controls
- Barrier/control/RPM effectiveness

A brief outline of the methodology in conducting a typical THESIS study is as follows:

- o Identification of MAH, Major Analyzed Hazards (from the review of previous quantitative and qualitative studies and analyses).

- o Documentation and recording each MAH. Additionally, documentation of the threats and consequences for each MAH as they are identified. Identify the “Barriers” that act to prevent the threats occurring and “Recovery Preparedness

Measures" (RPMs) that mitigate the potential consequences. During this exercise any barriers or RPMs that could be comprised will be developed to the escalation stage and any additional controls captured.

- All the barriers, controls and RPMs are scored for their judged effectiveness, ratings to be agreed with CariSal Limited.

- Identification and Documentation of Safety Critical Elements. From the Barriers and RPMs identified for a MAH, agree with the team the safety critical elements in place and record these in the THESIS Bow-Tie developed for the MAH under study.

- Propose Appropriate Recommendations / Remedial Actions on identification of any shortfalls where applicable.

- Repeat until all MAHs have been analysed.

- Risk Rank each hazard using the CariSal Limited corporate risk matrix, uploaded into the THESIS system.

THESIS Bowties are the initial step in developing a comprehensive and structured approach to risk management. Carisal will review the higher hazard scenarios evaluated during this analysis, and assign the principal responsibility for critical tasks and activities to ensure the performance of each barrier as a prevention control. Once documented in the HSE System, the "<none> currently displayed in each barrier box can be updated to provide graphical illustration of risk management at all levels in the day-to-day operation of its organization.

The detailed results of the Carisal BowTies and LOPA's are shown on the in Appendix 1 and 2 of this report.

Summary of CariSal Field BowTie Analysis

Initiating events including external, equipment failure, and inappropriate actions were analyzed for each hazard scenario. Guidance on estimating the frequency of each initiating event was based on failure rate data from product experience (including hazard analysis team experience), industry data provided from publications referenced from the Center for Chemical Process Safety (CCPS) [Reference 3], vendor data, or public domain. To improve the efficiency of hazard identification, qualitative reference for each graphical overview was extracted from the HAZID and HAZOP documents as barriers on the left side of the event. The right side of each Bowtie reflects a demonstration of organizational critical tasks in responding to the event to mitigate total impact of the consequence. Escalation factors preventing the effective performance of each barrier were documented based on the proposed development of the organizational HSE and management systems.

Critical information regarding additional layers of protection (LOPA) (i.e. passive barriers, instrumentation loops, process concentrations, etc.) was further detailed by process design documentation. Beginning with selected identified accident scenarios, the LOPA study used simplifying rules to evaluate initiating event frequency, independent layers of protection, and consequences to provide an order-of-magnitude estimate of the mitigated risk. Final endpoint of the consequence of risk was defined in terms of impact, harm or damage, release, physical effects from fires, explosion, and/or toxic release, estimated to a total order for magnitude of severity. This standard in industry eliminates the requirement for mathematical modeling and facilitates the comparison of risk from each scenario.

Scenario 1: Chlorine [indoor] Process Pipe Breach

Initiating events were primarily external and focused on most probable event scenarios. Facility layout design and siting generally exclude motor vehicle or construction equipment. Though sabotage and terrorism were discussed by the analysis team, they are historically considered extreme events and would require special treatment beyond the scope of this analysis. Conservative approach for crediting IPL targeted reliable over and differential pressure interlocks and electrolyzer shutdown on loss of power.

Scenario 2: Chlorine (Intermixing of Hypochlorite with HCl)

This is an analysis of a LOC due to both external and human failure-related initiating events. Although ineffective management systems are often a root cause of human error, incompatible nozzle design likely reduces the probability of employee or contractor inappropriate action. IPL credits “inherently safe’ design features such as as-built piping material of selection and dedicated loading to prevent the undesired consequence. With this approach the organization credits PFD on requirement for inspection and maintenance auditing to ensure all process changes continually comply with original process specifications.

Scenario 3: Chlorine [outdoor] Process Pipe Breach

This is the most credible scenario to examine seismic events crediting reduction in frequency of large consequences of an explosion by confining the effects of the hazard event via building codes as passive IPL and process design (i.e. differential pressure interlock and Cl2 monitoring and automatic shutdown system).

Scenario 4: Onsite NaOH Storage

Anticipated initiating events are likely due to mechanical or external failure. Risk based maintenance programs are assumed to be in place and formed the basis for judgment determination for the PFD. Additionally, the enforcement of sound maintenance practices will be a continual factor affecting IPL during the operation of the facility. Siting during initial facility layout, isolation valves in piping and storage containment reduce the effect of total individual impact.

Scenario 5: Onsite Natural Gas

Initiating events were primarily external and focused on most probable event scenarios. Facility layout design and siting generally exclude motor vehicle or construction equipment. Though sabotage and terrorism were discussed by the analysis team, they are historically considered extreme events and would require special treatment beyond the scope of this analysis

Scenario 6 & 7: HCl Tank Truck Accident & Hypochlorite Tank Truck

Barriers to vehicular incident were based on statistics available from the US Department of Transportation and are consistent with enabling and root causes with the chemical industry. This type of historical data is considered statistically significant and is an excellent basis for determining probability of failure. The effectiveness of the human aspect IPL can be easily and accurately audited during the selection and certification of motor carriers.

Scenario 8: Hydrogen Vent Stack Release

Inherent process design affords operation with saturated or wet H2 and a total plant shutdown on loss of nitrogen. Additionally, a temperature monitor with steam quench is designed on the flare exit.

Scenario 9: Hydrogen [indoor/outdoor] process pipe breach

This is the most credible scenario to examine seismic events crediting reduction in frequency of large consequences of an explosion by confining the effects of the hazard event via building codes as passive IPL and process design (i.e. differential pressure interlock and H2 monitoring with automatic shutdown.

Scenario 10: HCl Scrubber Stack Release

Inherent process design affords operation of the electrolyzer in a manner such that only saturated or wet H2 is generated. Additionally, a low pressure process switch

shutdowns the plant upon loss of nitrogen preventing accumulation of a flammable vapor cloud. IPL credits were derived from pressure control and SIL instrument systems.

Scenario 11: Offsite NaOH Storage

Anticipated initiating events are likely due to mechanical or external failure. Risk based maintenance programs are assumed to be in place and formed the basis for judgment determination for the PFD. Additionally, the enforcement of sound maintenance practices will be a continual factor affecting IPL during the operation of the facility. Siting during initial facility layout, isolation valves in piping and storage containment reduce the effect of total individual impact. PPE and drain sump can minimize the effect of incidents.

Scenario 12: Offsite NaOH Pipeline

Anticipated initiating events are likely due to seismic event or external impact. In such event, differential pressure or flow switch will stop the flow immediately. In addition, a community emergency response program will reduce the chance of injuries due to chemical burn.

Scenario 13: Offsite Natural Gas Pipeline

Anticipated initiating events are likely due to seismic event or external impact. A community program will reduce probability of external impact and the chance of injuries after an incident. Proper build codes and pipe specs also may withstand the damage in seismic event and external impact.

Scenario 14: Diesel in Emergency Generator Sets

The major risk is static discharge during fuel refilling. Proper grounding and refilling speeding will reduce the risk of static discharge.

Scenario 15 & 16: Onsite HCl & Hypochlorite Storage Tank

Anticipated initiating events are likely due to mechanical or external failure. Risk based maintenance programs are assumed to be in place and formed the basis for judgment determination for the PFD. Additionally, the enforcement of sound maintenance practices will be a continual factor affecting IPL during the operation of the facility. Siting during initial facility layout, isolation valves in piping and storage containment reduce the effect of total individual impact.

Scenario 17: 93% Sulfuric Acid Storage Tank

Anticipated initiating events are likely due to mechanical or external failure. Risk based maintenance programs are assumed to be in place and formed the basis for judgment determination for the PFD. Additionally, the enforcement of sound maintenance practices will be a continual factor affecting IPL during the operation of the facility. Dike and limestone in the dike area will limit effect of tank failure.

Scenario 18: Chlorine Process Pipe Leaks

Chlorine may leak due to connection failure. A reliable mechanical integrity program can reduce the frequency of connection failure. Conservative approach for crediting IPL targeted reliable differential pressure interlocks, and Cl2 detector with automatic shutdown.

A summary table of the LOPA study results is shown below:

Bowtie	Scenario	Location	Frequency[1]	Length/ Number	Mitigation Contributing to Lower Frequency	Mitigated Frequency
1	Cl_2 indoor process pipe break	indoors	1E-6/yr	30 m x 2	Material selection & pressure testing Overpressure interlock Differential pressure interlock Area monitor w/auto shutdown Electrolyzer stops on power loss	1E-9/yr
2	Intermixing of hypochlorite with HCl	Storage area	1E-7/yr			
3	Cl_2 outdoor process pipe break	outdoors	1E-6/yr	75 m x 2	Material selection & pressure testing Overpressure interlock Differential pressure interlock Cl_2 monitor w/auto & manual shutdown Electrolyzer stops on power loss	1E-9/yr
3.1	Cl_2 connection failure *(equivalent to #3)*	outdoors			Material selection & pressure testing Overpressure interlock Mechanical water seal Differential pressure interlock Area monitor w/auto shutdown	1E-7/yr
4	NaOH tank failure	Storage area	1E-6/yr	4 medium and 1 small tank		
5	Onsite natural gas deflagration	Near site	1E-6/yr			
6	HCl tank truck accident	roads	3E-7/yr	80 trucks/yr	Specialized tank truck Shipping & receiving schedule notification	1E-7/yr
7	Hypochlorite tank truck accident	roads	3E-7/yr	3200 trucks/yr		
8	H_2 vent stack release	stack	1E-6/yr		Low pressure switch Plant can't operate w/o N_2 Temp monitor w/steam extinguisher	1E-7/yr
9	H_2 indoor process pipe break	indoors	1E-6/yr	Not needed		
9	H_2 outdoor process pipe break	outdoors	1E-6/yr	Not needed		
n/a	H_2 process pipe break [seismic]	outdoors	1E-6/yr	Not needed		

[1] *Quantitative Risk Assessment, Appendix C.* (2008, Table ES-7. p. 16, Accident Scenarios for which Quantitative Modeling was Conducted.)

Bowtie	Scenario	Location	Frequency[1]	Length/ Number	Mitigation Contributing to Lower Frequency	Mitigated Frequency
10	HCl scrubber stack release	scrubber	1E-6/yr			
11	Offsite EISL caustic tank breach	EISL, Caroni	1E-6/yr	1 large tank at EISL; 2 at Caroni		
12	Offsite caustic pipeline breach	EISL, pier	1E-6/yr	2300 m		
13	Offsite natural gas deflagration	Near site	1E-6/yr			
14	Diesel in the Emergency Generator Sets	Near site				
15	HCl tank failure	Storage area	1E-6/yr	150 m of pipe; 1 large tank; also 4 medium and 1 small tank	Material selection/mechanical procedure Dike Limestone in dike area	1E-8/yr
16	Hypochlorite tank failure	Storage area	1E-6/yr	150 m of pipe; 4 medium and 2 small tanks		
17	Onsite Sulfuric Acid Storage Tank	Storage area				
18	Cl_2 process pipe break [seismic]	outdoors	1E-6/yr	75 m x 2	Building code Differential pressure interlock Cl_2 monitor w/auto & manual shutdown Electrolyzer stops on power loss	1E-8/yr

SECTIONS

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THESIS

TECHNICAL RESULTS

BowTie & LOPA’s

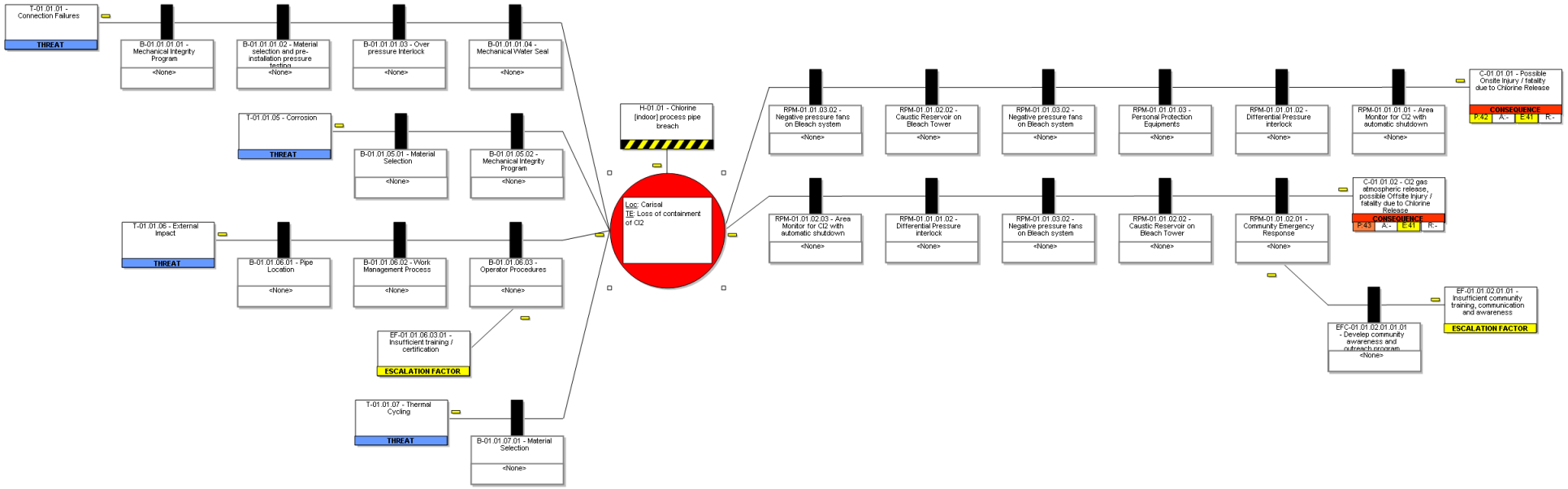
Due the limitation of Thesis software, the display of CariSal Risk Matrix in the Bow-Tie is different with the original Risk Matrix in CariSal EIA document, but the definition of both Risk Matrixes are exactly same and as defined in the CariSal EIA document. The following table illustrates the Risk Matrixes used in Thesis and EIA document.

Risk Matrix					
Severity / Likelihood	1	2	3	4	5
5	15(C)	25(C)	35(D)	45(E)	55(E)
4	14(B)	24(C)	34(C)	44(D)	54(E)
3	13(B)	23(B)	33(C)	43(D)	53(D)
2	12(A)	22(B)	32(C)	42(C)	52(D)
1	11(A)	21(A)	31(B)	41(C)	51(D)

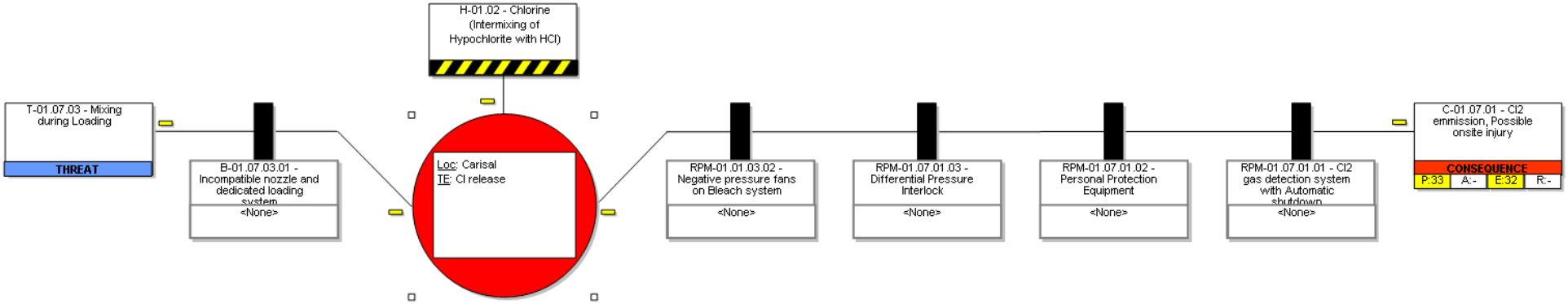
15	Thesis Risk Matrix
(C)	CariSal EIA document

CariSal BowTie Diagrams

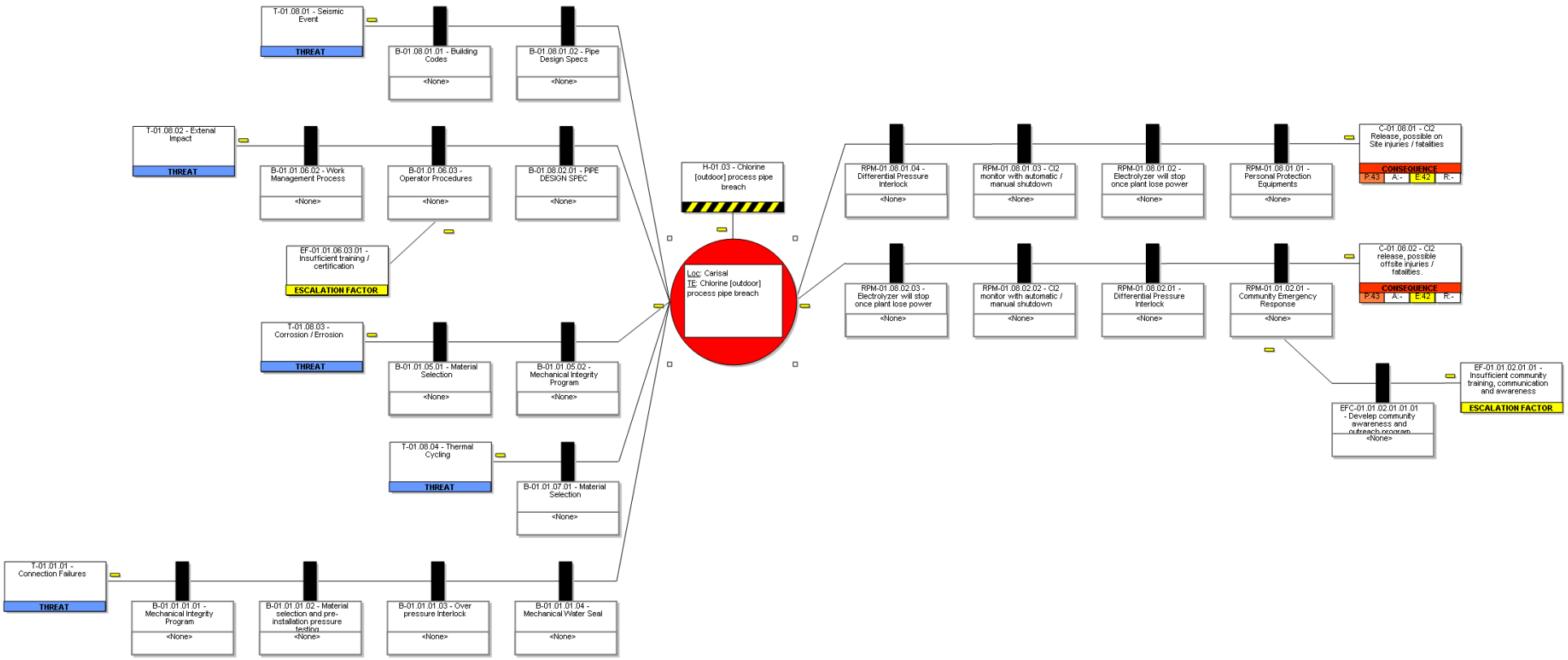
Scenario 1: Chlorine [indoor] process pipe breach



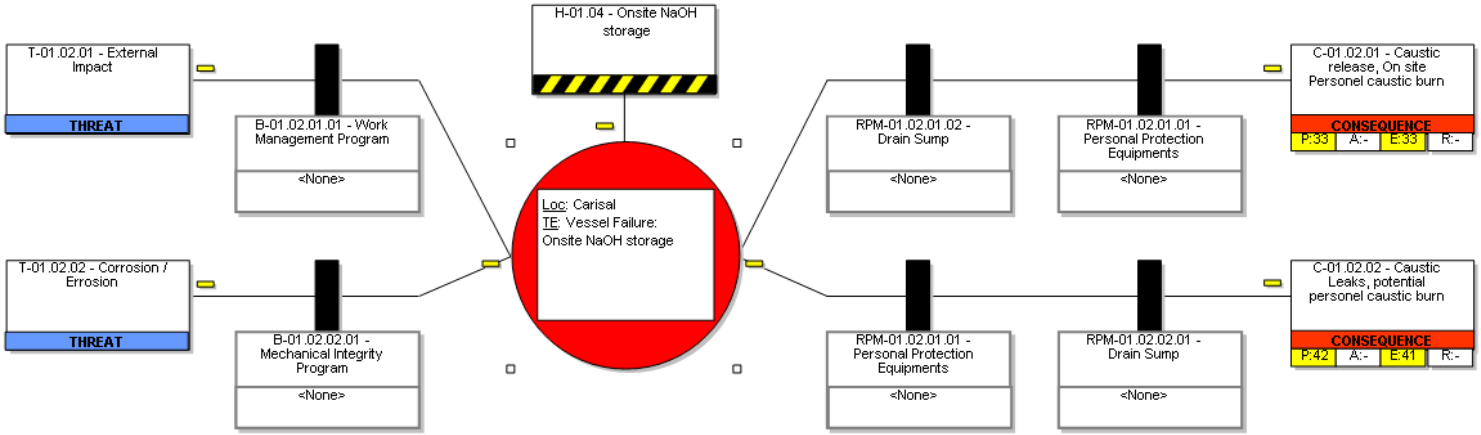
Scenario 2: Chlorine (Intermixing of Hypochlorite with HCl)



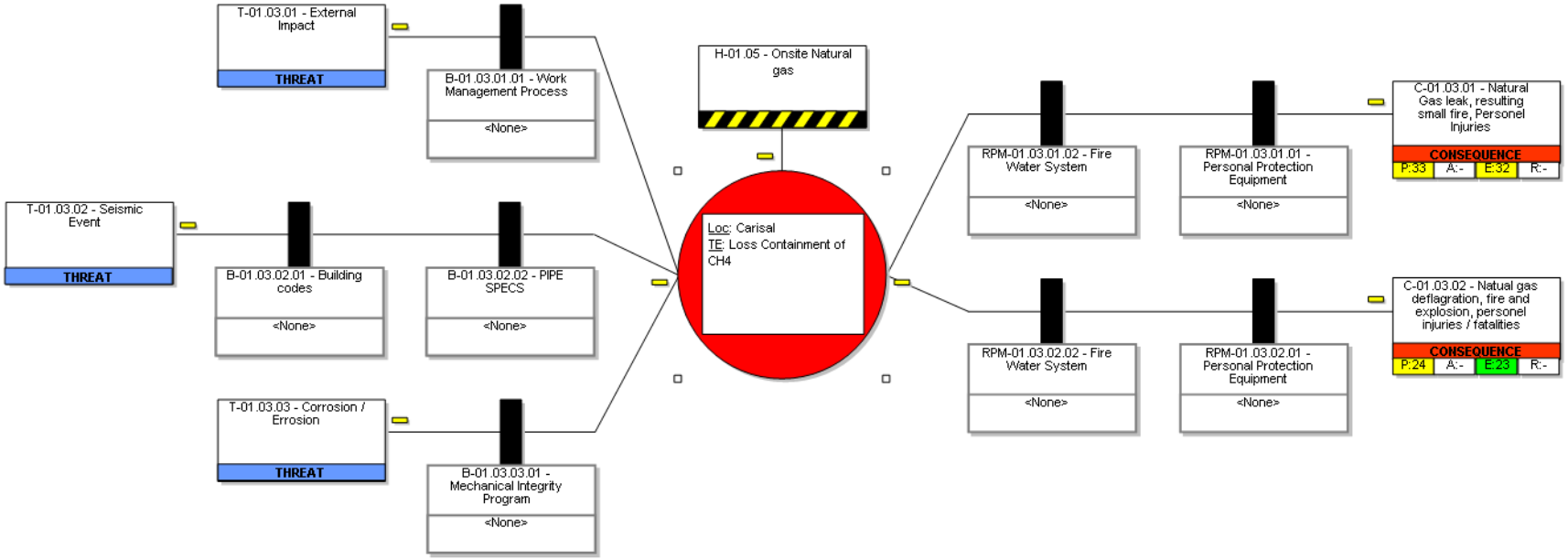
Scenario 3: Chlorine [outdoor] process pipe breach



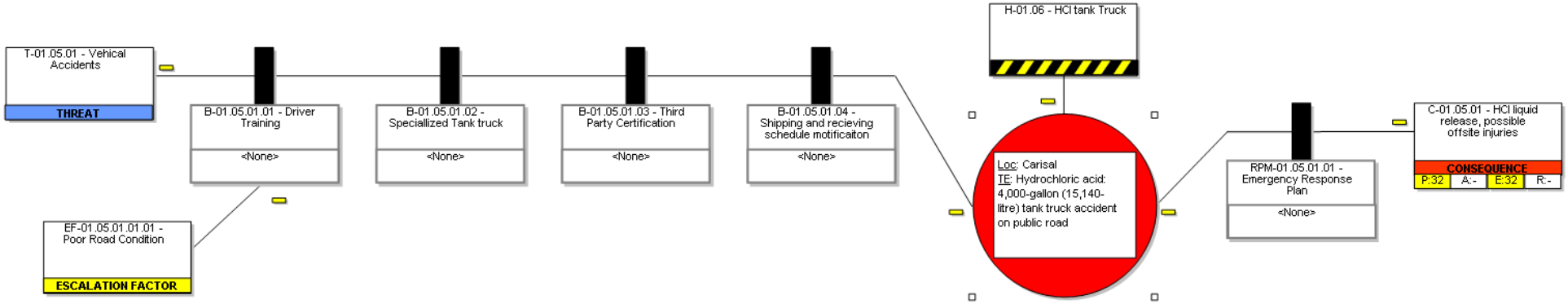
Scenario 4: Onsite NaOH storage



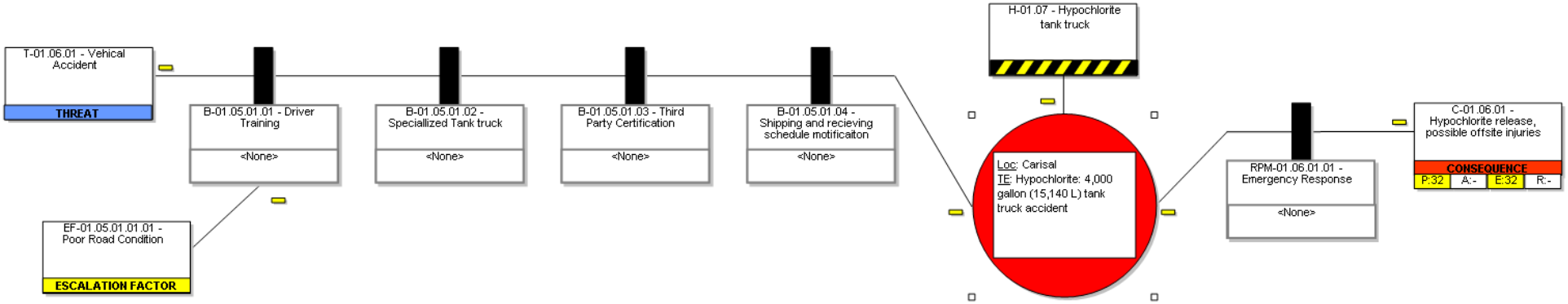
Scenario 5: Onsite Natural gas



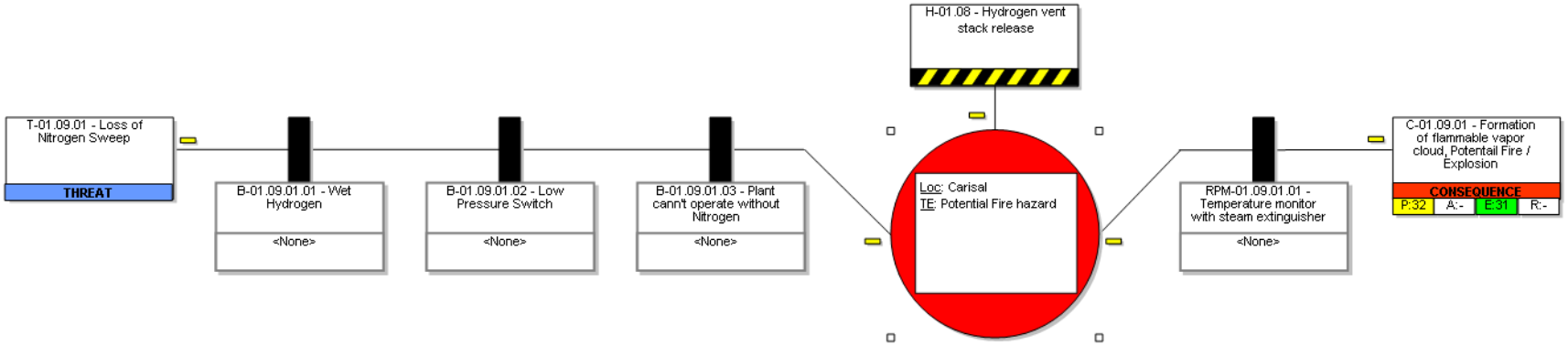
Scenario 6: HCl Tank Truck



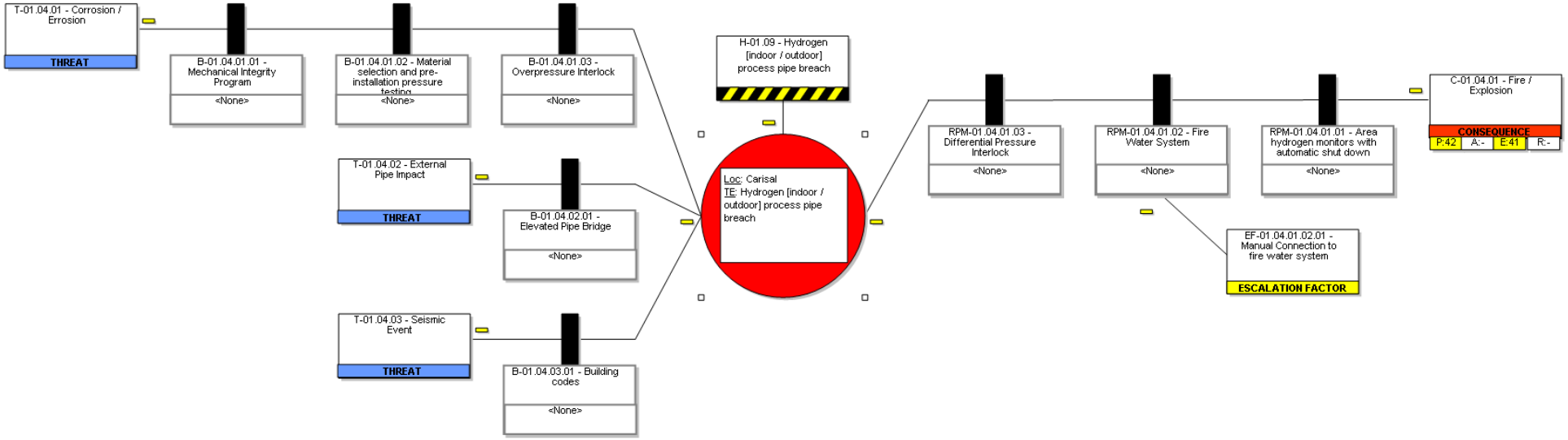
Scenario 7: Hypochlorite Tank Truck



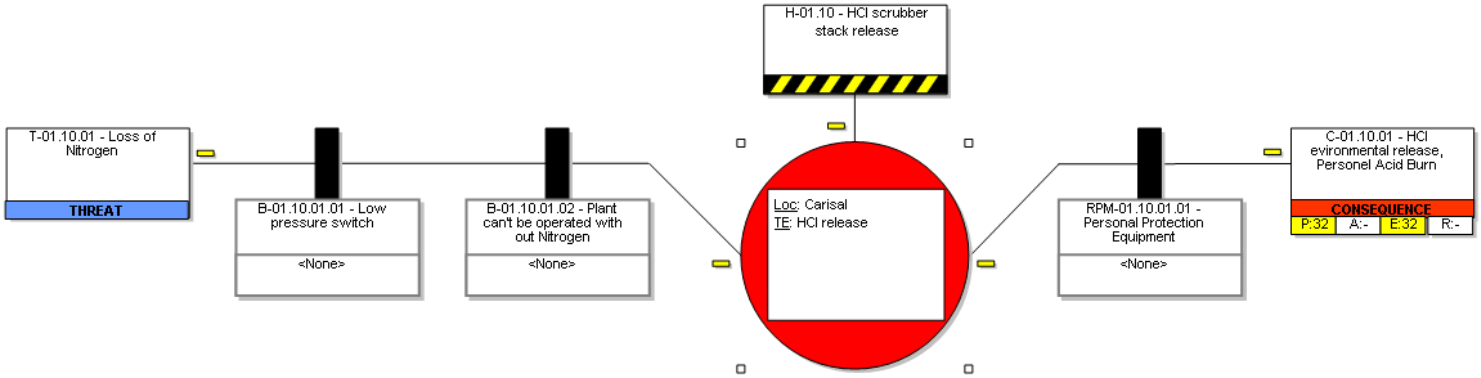
Scenario 8: Hydrogen vent stack release



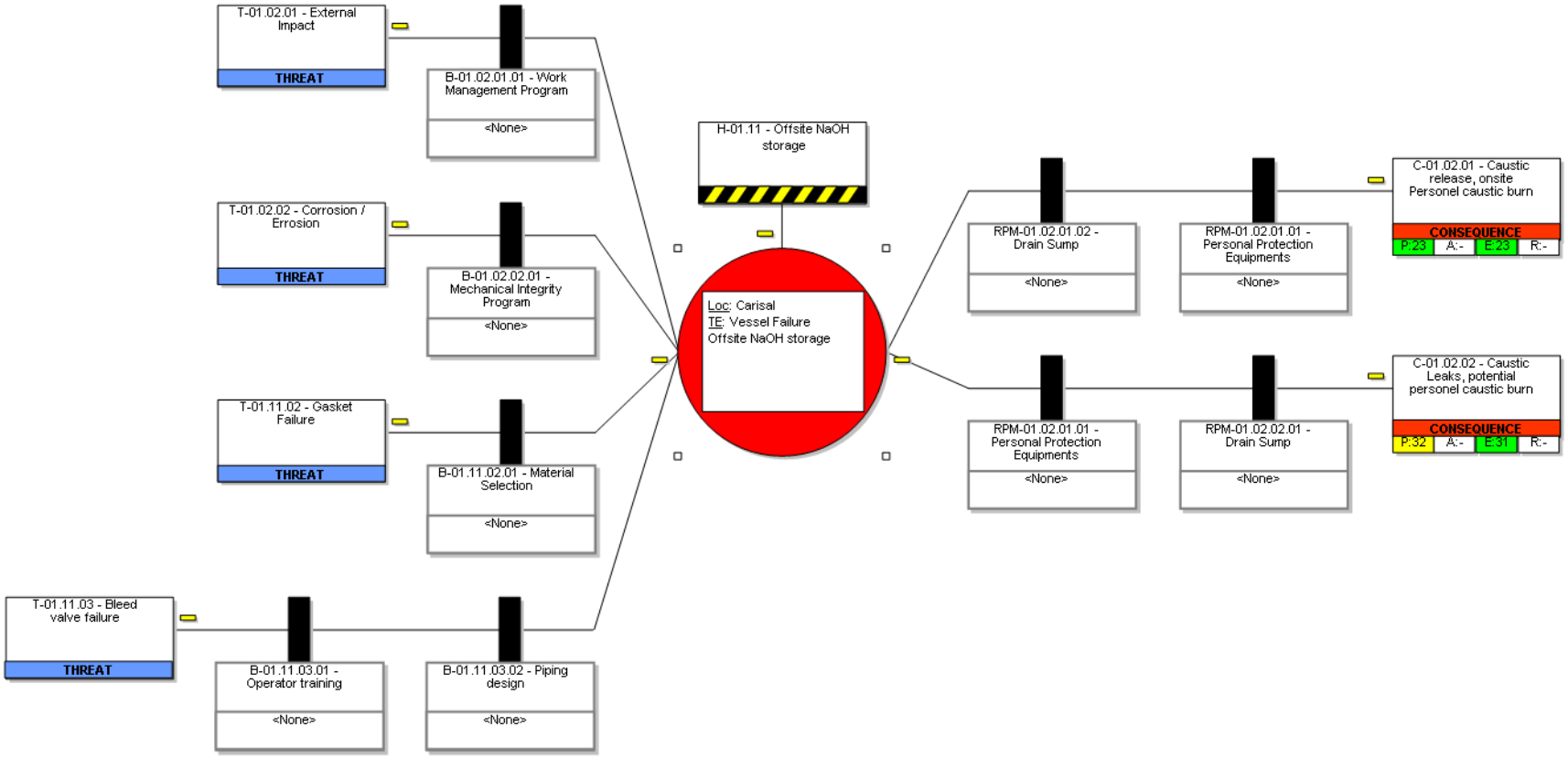
Scenario 9: Hydrogen [indoor/outdoor] process pipe breach



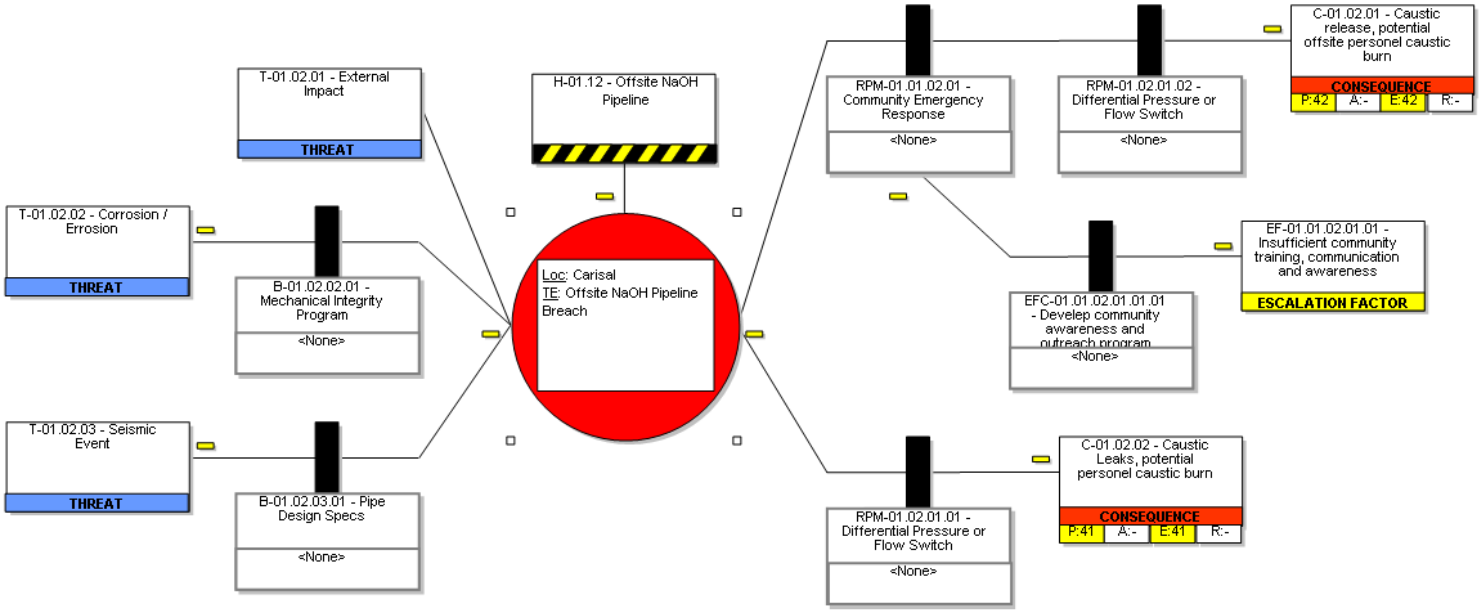
Scenario 10: HCl scrubber stack release



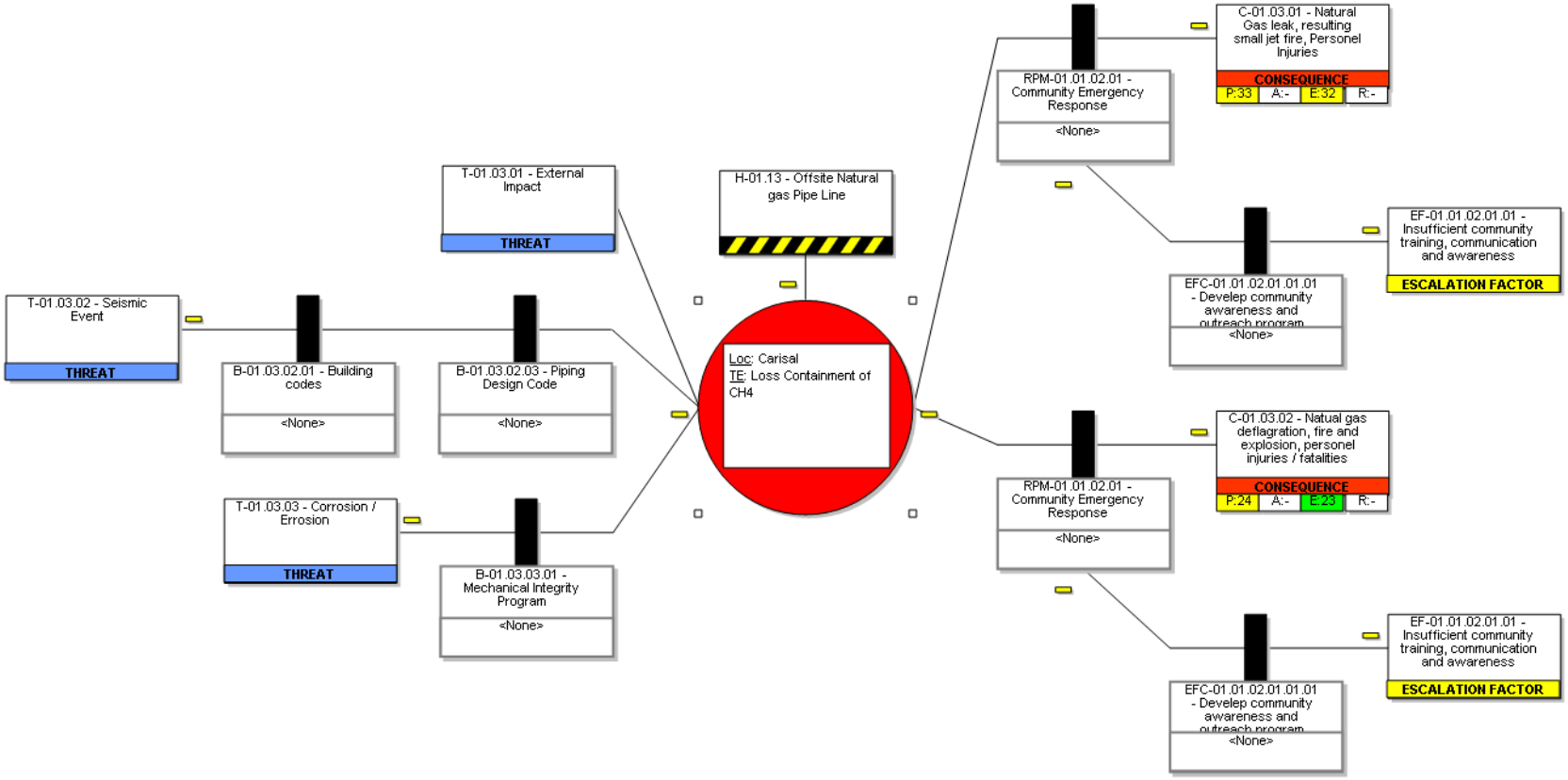
Scenario 11: Offsite NaOH storage



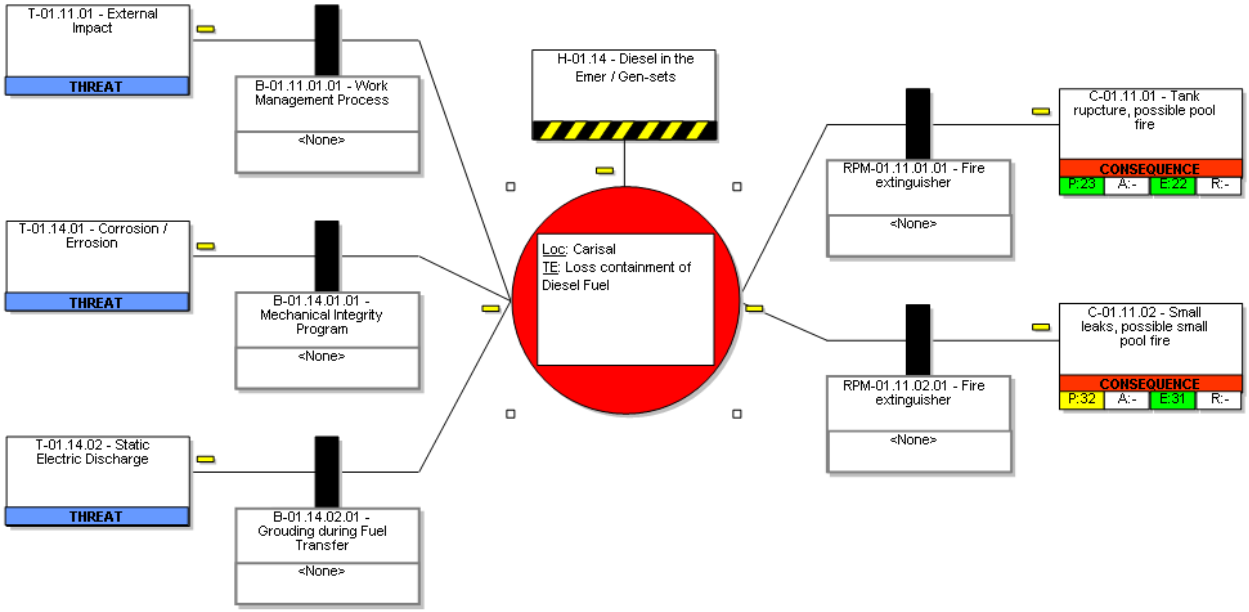
Scenario 12: Offsite NaOH Pipeline



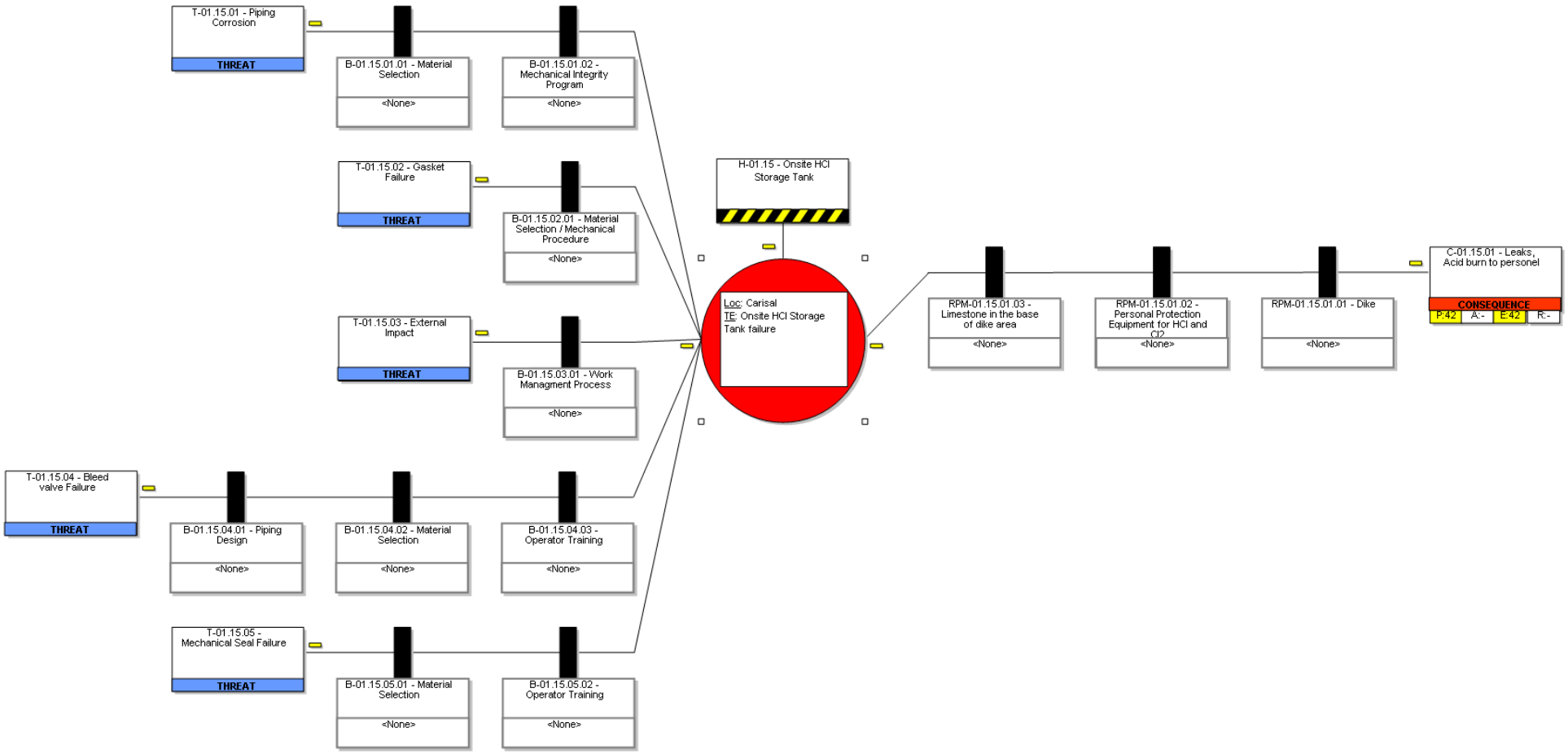
Scenario 13: Offsite Natural gas Pipe Line



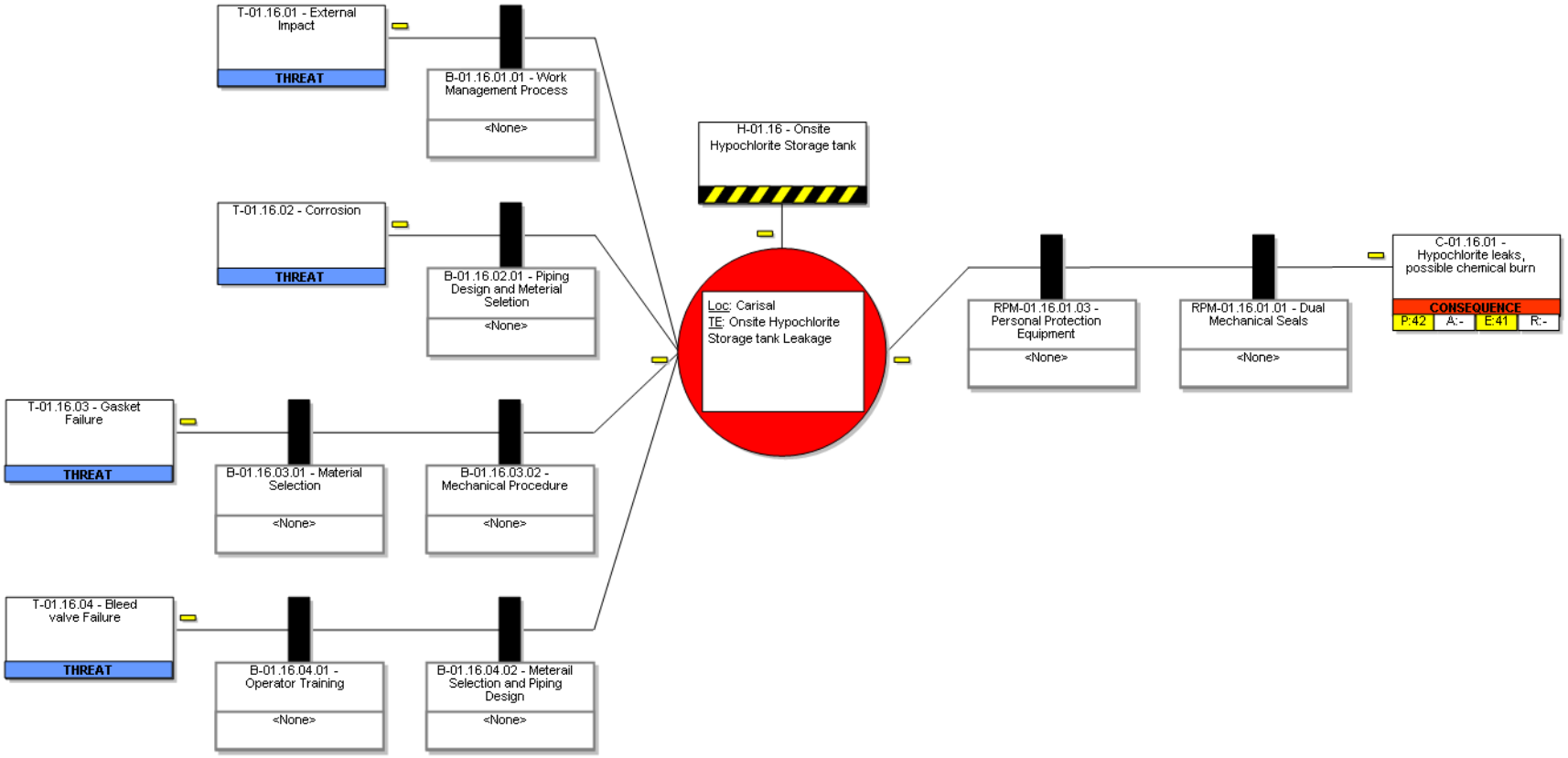
Scenario 14: Diesel in The Emergency Generator Sets



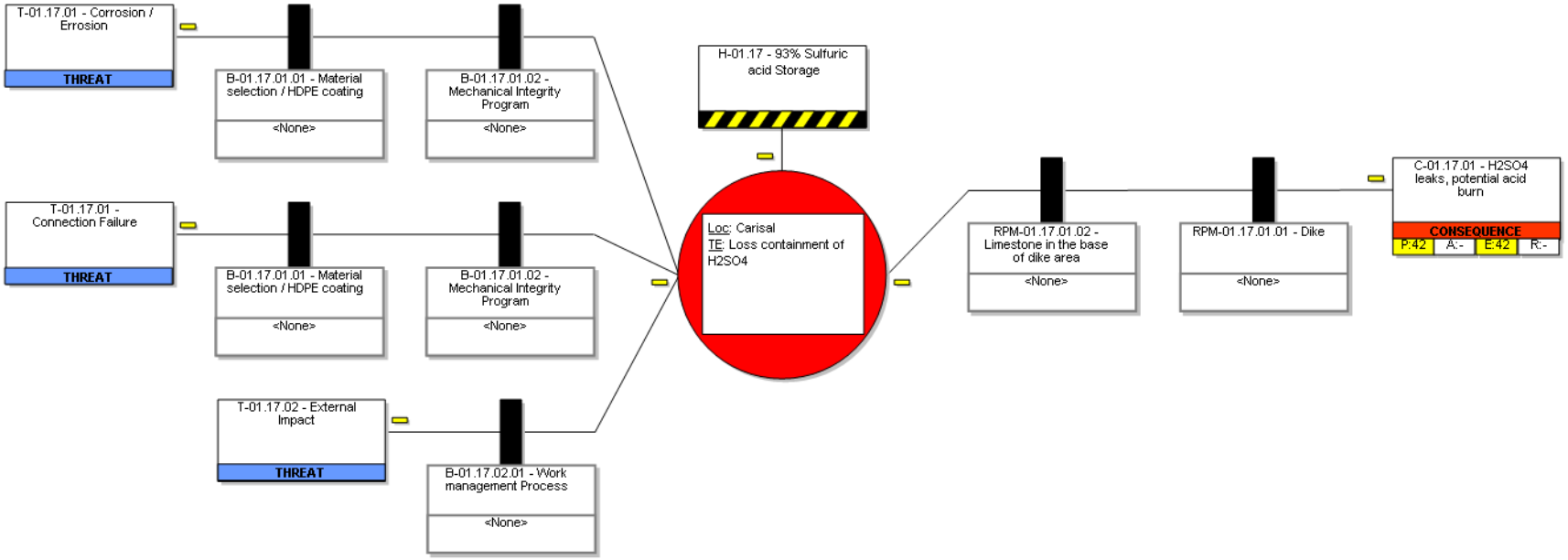
Scenario 15: Onsite HCl Storage Tank



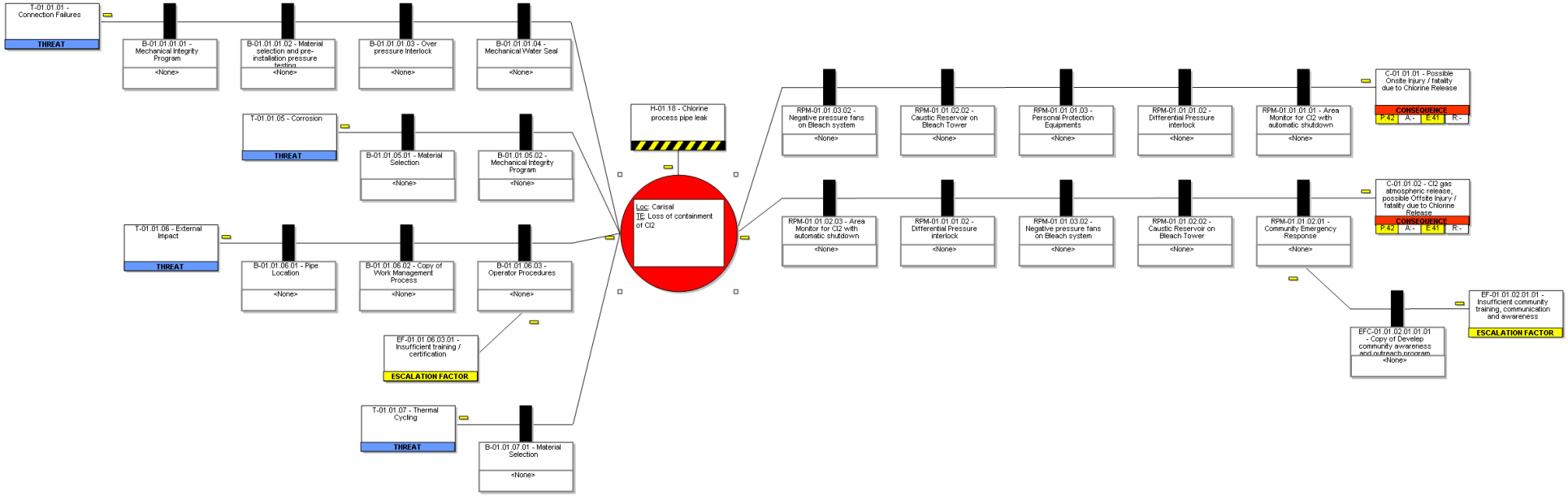
Scenario 16: Onsite Hypochlorite Storage tank



Scenario 17: Onsite Sulfuric Acid Storage tank



Scenario 18: Chlorine Process Pipe Leak



CariSal LOPA Diagrams

Abreviation Used in LOPA	
Abreviation	**Definition**
CT	Severity of consequence (the Unmitigated Consequence)
FCT	Frequency of (mitigated) consequence
RCT	Residual risk
IEF	Initial Event Frequency
PFD	Probility of Failure on Demand

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: **My Case**

Hazard: **H-01.01 - Chlorine [indoor] process pipe breach**

Location: **Carisal** **Top Event: Loss of containment of Cl2**

THREAT: Connection Failures

I.E.F. ID	Carisal 1	I.E.F.	1.000E-002	I.E.F. Data Comments	
Enabling Factor	None	P-EnF	0.000E+000	P-EnF Comments	
Barrier ID:	B-01.01.01.01 - Mechanical Integrity Program	PFD-B	1.000E+000	PFD-B Comments	
Barrier ID:	B-01.01.01.02 - Material selection and pre-installation pressure testing	PFD-B	1.000E-002	PFD-B Comments	Inherent safety Design
Barrier ID:	B-01.01.01.03 - Over pressure Interlock	PFD-B	1.000E-001	PFD-B Comments	SIL 1
Barrier ID:	B-01.01.01.04 - Mechanical Water Seal	PFD-B	1.000E+000	PFD-B Comments	SIL 1

CONSEQUENCE: Cl2 gas atmospheric release, possible Offsite Injury/fatality due to Chlorine Release

Conditional Modifier	None	P-CM	0.000E+000	P-CM Comments	
RPM ID:	RPM-01.01.01.02 - Differential Pressure interlock	PFD-RPM	1.000E-001	PFD-RPM Comments	SIL 1
RPM ID:	RPM-01.01.02.01 - Community Emergency Response	PFD-RPM	1.000E+000	PFD-RPM Comments	
RPM ID:	RPM-01.01.02.02 - Caustic Reservoir on Bleach Tower	PFD-RPM	1.000E+000	PFD-RPM Comments	
RPM ID:	RPM-01.01.02.03 - Area Monitor for Cl2 with automatic shutdown	PFD-RPM	1.000E-001	PFD-RPM Comments	SIL 1
RPM ID:	RPM-01.08.02.03 - Electrolyzer will stop once plant lose power	PFD-RPM	1.000E-002	PFD-RPM Comments	Inherent Safety Design
RPM ID:	RPM-01.01.03.02 - Negative pressure fans on Bleach system	PFD-RPM	1.000E+000	PFD-RPM Comments	

LOPA

CT	1.0000E+003	CT Comments	
FCT	1.0000E-009	Residual Risk, RCT	1.0000E-006
Acceptance Criteria Ref.	Carisal(1.00e-003)	Acceptance Criteria Met?	✓

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: My Case

Hazard: H-01.03 - Chlorine [outdoor] process pipe breach

Location: Carisal **Top Event:** Chlorine [outdoor] process pipe breach

THREAT: Connection Failures

I.E.F. ID	Carisal 1	I.E.F.	1.000E-002	I.E.F. Data Comments	
Enabling Factor	None	P-EnF	0.000E+000	P-EnF Comments	
Barrier ID:	B-01.01.01.01 - Mechanical Integrity Program	PFD-B	1.000E+000	PFD-B Comments	
Barrier ID:	B-01.01.01.02 - Material selection and pre-installation pressure testing	PFD-B	1.000E-002	PFD-B Comments	Inherent Safety Design
Barrier ID:	B-01.01.01.03 - Over pressure Interlock	PFD-B	1.000E-001	PFD-B Comments	SIL 1
Barrier ID:	B-01.01.01.04 - Mechanical Water Seal	PFD-B	1.000E+000	PFD-B Comments	

CONSEQUENCE: Cl2 release, possible offsite injuries/fatalities.

Conditional Modifier	None	P-CM	0.000E+000	P-CM Comments	
RPM ID:	RPM-01.01.02.01 - Community Emergency Response	PFD-RPM	1.000E+000	PFD-RPM Comments	
RPM ID:	RPM-01.08.02.01 - Differential Pressure Interlock	PFD-RPM	1.000E-001	PFD-RPM Comments	SIL 1
RPM ID:	RPM-01.08.02.02 - Cl2 monitor with automatic/manual shutdown	PFD-RPM	1.000E-001	PFD-RPM Comments	SIL 1
RPM ID:	RPM-01.08.02.03 - Electrolyzer will stop once plant lose power	PFD-RPM	1.000E-002	PFD-RPM Comments	Inherent Safety Design

LOPA

CT	1.0000E+003	CT Comments	
FCT	1.0000E-009	Residual Risk, RCT	1.0000E-006
Acceptance Criteria Ref.	Carisal(1.00e-003)	Acceptance Criteria Met?	✓

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: My Case

Hazard: H-01.03 - Chlorine [outdoor] process pipe breach

Location: Carisal **Top Event:** Chlorine [outdoor] process pipe breach

THREAT: Connection Failures

I.E.F. ID	Carisal 1	I.E.F.	1.000E-002	I.E.F. Data Comments	
Enabling Factor	None	P-EnF	0.000E+000	P-EnF Comments	
Barrier ID:	B-01.01.01.01 - Buidling Code	PFD-B	1.000E-002	PFD-B Comments	Inherent Safety Design
Barrier ID:	B-01.01.01.02 - Piping Design Specs	PFD-B	1.000E+000	PFD-B Comments	Inherent Safety Design

CONSEQUENCE: Cl2 release, possible offsite injuries/fatalities.

Conditional Modifier	None	P-CM	0.000E+000	P-CM Comments	
RPM ID:	RPM-01.01.02.01 - Community Emergency Response	PFD-RPM	1.000E+000	PFD-RPM Comments	
RPM ID:	RPM-01.08.02.01 - Differential Pressure Interlock	PFD-RPM	1.000E-001	PFD-RPM Comments	SIL 1
RPM ID:	RPM-01.08.02.02 - Cl2 monitor with automatic/manual shutdown	PFD-RPM	1.000E-001	PFD-RPM Comments	SIL 1
RPM ID:	RPM-01.08.02.03 - Electrolyzer will stop once plant lose power	PFD-RPM	1.000E-002	PFD-RPM Comments	Inherent Safety Design

LOPA

CT	1.0000E+003	CT Comments	
FCT	1.0000E-008	Residual Risk, RCT	1.0000E-005
Acceptance Criteria Ref.	Carisal(1.00e-003)	Acceptance Criteria Met?	✓

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: **My Case**

Hazard: **H-01.08 - Hydrogen vent stack release**

Location: **Carisal** **Top Event: Potential Fire hazard**

THREAT: Loss of Nitrogen Sweep

I.E.F. ID	Carisal 2	**I.E.F.**	1.000E-003	**I.E.F. Data Comments**	
Enabling Factor	S1	**P-EnF**	1.000E+000	**P-EnF Comments**	
Barrier ID:	B-01.09.01.01 - Wet Hydrogen	**PFD-B**	1.000E+000	**PFD-B Comments**	
Barrier ID:	B-01.09.01.02 - Low Pressure Switch	**PFD-B**	1.000E-001	**PFD-B Comments**	
Barrier ID:	B-01.09.01.03 - Plant can't operate without Nitrogen	**PFD-B**	1.000E-002	**PFD-B Comments**	

CONSEQUENCE: Formation of flammable vapor cloud, Potential Fire / Explosion

Conditional Modifier	None	**P-CM**	0.000E+000	**P-CM Comments**	
RPM ID:	RPM-01.09.01.01 - Temperature monitor with steam extinguisher	**PFD-RPM**	1.000E-001	**PFD-RPM Comments**	

LOPA

CT	1.0000E+002	**CT Comments**	
FCT	1.0000E-007	**Residual Risk, RCT**	1.0000E-005
Acceptance Criteria Ref.	Carisal(1.00e-003)	**Acceptance Criteria Met?**	✓

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: My Case

Hazard: H-01.15 - Onsite HCl Storage Tank

Location: Carisal **Top Event:** Onsite HCl Storage Tank failure

THREAT: Gasket Failure

I.E.F. ID	Carisal 1	I.E.F.	1.000E-002	I.E.F. Data Comments	
Enabling Factor	None	P-EnF	0.000E+000	P-EnF Comments	
Barrier ID:	B-01.15.02.01 - Material Selection/Mechanical Procedure	PFD-B	1.000E-002	PFD-B Comments	Inherent Safety Design

CONSEQUENCE: Leaks, Acid burn to personnel

Conditional Modifier	None	P-CM	0.000E+000	P-CM Comments	
RPM ID:	RPM-01.15.01.01 - Dike	PFD-RPM	1.000E-002	PFD-RPM Comments	
RPM ID:	RPM-01.15.01.02 - Personal Protection Equipment for HCl and Cl2	PFD-RPM	1.000E+000	PFD-RPM Comments	
RPM ID:	RPM-01.15.01.03 - Limestone in the base of dike area	PFD-RPM	1.000E-002	PFD-RPM Comments	

LOPA

CT	1.0000E+002	CT Comments	
FCT	1.0000E-008	Residual Risk, RCT	1.0000E-006
Acceptance Criteria Ref.	Carisal(1.00e-003)	Acceptance Criteria Met?	✓

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: My Case

Hazard: H-01.06 - HCl tank Truck

Location: Carisal

Top Event: Hydrochloric acid: 4,000-gallon (15,140-litre) tank truck accident on public road

THREAT: Vehical Accidents

I.E.F. ID	Carisal 2	I.E.F.	1.000E-003	I.E.F. Data Comments	
Enabling Factor	None	P-EnF	0.000E+000	P-EnF Comments	
Barrier ID:	B-01.05.01.01 - Driver Training	PFD-B	1.000E+000	PFD-B Comments	
Barrier ID:	B-01.05.01.02 - Speciallized Tank truck	PFD-B	1.000E-002	PFD-B Comments	Inherent Safety Design
Barrier ID:	B-01.05.01.03 - Third Party Certification	PFD-B	1.000E+000	PFD-B Comments	
Barrier ID:	B-01.05.01.04 - Shipping and recieving schedule motificaiton	PFD-B	1.000E-002	PFD-B Comments	Inherent Safety Design

CONSEQUENCE: HCl liquid release, possible offsite injuries

Conditional Modifier	None	P-CM	0.000E+000	P-CM Comments	
RPM ID:	RPM-01.05.01.01 - Emergency Response Plan	PFD-RPM	1.000E+000	PFD-RPM Comments	

LOPA

CT	1.0000E+002	CT Comments	
FCT	1.0000E-007	Residual Risk, RCT	1.0000E-005
Acceptance Criteria Ref.	Carisal(1.00e-003)	Acceptance Criteria Met?	✓

LAYER OF PROTECTION ANALYSIS FOR HAZARD LOCATION

THESIS Case Name: **My Case**

Hazard: **H-01.18 - Chlorine process pipe leak**

Location: **Carisal** **Top Event: Loss of containment of Cl2**

THREAT: Connection Failures

I.E.F. ID	Carisal 3	**I.E.F.**	1.000E-001	**I.E.F. Data Comments**	
Enabling Factor	None	**P-EnF**	0.000E+000	**P-EnF Comments**	
Barrier ID:	B-01.01.01.01 - Mechanical Integrity Program	**PFD-B**	1.000E+000	**PFD-B Comments**	
Barrier ID:	B-01.01.01.02 - Material selection and pre-installation pressure testing	**PFD-B**	1.000E-002	**PFD-B Comments**	Inherent safety Design
Barrier ID:	B-01.01.01.03 - Over pressure Interlock	**PFD-B**	1.000E-001	**PFD-B Comments**	SIL 1
Barrier ID:	B-01.01.01.04 - Mechanical Water Seal	**PFD-B**	1.000E-001	**PFD-B Comments**	SIL 1

CONSEQUENCE: Cl2 gas atmospheric release, possible Offsite Injury/fatality due to Chlorine Release

Conditional Modifier	None	**P-CM**	0.000E+000	**P-CM Comments**	
RPM ID:	RPM-01.01.01.02 - Differential Pressure interlock	**PFD-RPM**	1.000E-001	**PFD-RPM Comments**	SIL 1
RPM ID:	RPM-01.01.02.01 - Community Emergency Response	**PFD-RPM**	1.000E+000	**PFD-RPM Comments**	
RPM ID:	RPM-01.01.02.02 - Caustic Reservoir on Bleach Tower	**PFD-RPM**	1.000E+000	**PFD-RPM Comments**	
RPM ID:	RPM-01.01.02.03 - Area Monitor for Cl2 with automatic shutdown	**PFD-RPM**	1.000E-001	**PFD-RPM Comments**	SIL 1
RPM ID:	RPM-01.01.03.02 - Negative pressure fans on Bleach system	**PFD-RPM**	1.000E+000	**PFD-RPM Comments**	

LOPA

CT	1.0000E+002	**CT Comments**	
FCT	1.0000E-007	**Residual Risk, RCT**	1.0000E-005
Acceptance Criteria Ref.	Carisal(1.00e-003)	**Acceptance Criteria Met?**	✓

<End of Illustrations>

Glossary of Terms

Barrier	A measure put in place to block a threat from releasing a risk. Barriers may be physical (shields, isolation, separation, protective devices) or non-physical (procedures, warnings, training, drills).
Conditional Modifier (CM)	An event or condition that makes possible another event. These do not cause a scenario but must be present for the scenario to develop.
Consequence	An event or chain of events that result from the release of a hazard.
C_T	Severity of the unmitigated Consequence.
Escalation Factor	Conditions that lead to increased risk due to loss/overriding of barriers or recovery preparedness measures.
Frequency of (mitigated) Consequence (FCT)	A measure of the baseline risk associated with the scenario providing a basis from which the importance of the IPLs associated with a particular scenario can be assessed.
Initiating Event Frequency (IEF)	The frequency with which the event that initiates the scenario leading to the undesired consequence takes place.
Independent Protection Layer (IPL)	A layer of protection that will prevent an unsafe scenario from progressing regardless of the initiating event or the performance of another layer.
Probability of Failure on Demand (PFD)	The probability that a system will fail to perform a specified function on demand.
Residual Risk (RCT)	The likelihood that a specified undesired event will occur and the severity of the consequences of the event after controlling the hazards.
Safety Critical Equipment (SCE)	Engineering controls that provide layers of protection to lower the risk category of a specific scenario.
Threat	A possible cause that will potentially release a hazard and produce an incident. Threat classes include damage caused by high temperature, corrosion, fatigue, poor visibility, etc.
Top Event (TE)	The 'release' of a hazard that is the undesired event at the end of the fault tree and at the beginning of an event tree. The center point in the 'Bow-tie' Diagram.

References

1. *Process Safety Management Standard of Highly Hazardous Chemicals*, 29 CFR 1910.119, U.S. Occupational and Safety Administration, May 1992.

2. *Guidelines for Risk Based Process Safety*, Center for Chemical Process Safety, Wiley, New York, NY, 2007.

3. *Layer of Protection Analysis: Simplified Process Risk Assessment*, Center for Chemical Process Safety, Wiley, New York, NY, 2007.

APPENDIX D
RECORDS OF PUBLIC AND OTHER STAKEHOLDER ENGAGEMENT

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Meetings

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Dear Sir or Madam:

CariSal Limited has submitted an application for a Certificate of Environmental Clearance to the Environmental Management Authority (EMA) to construct and operate a Caustic Soda and Calcium Chloride Facility in the Point Lisas Industrial Estate. The project will be one of the first examples of industrial design for clean production in Trinidad & Tobago.

CariSal's environmental team is in the process of responding to a request for additional information from the EMA. Toward this end, we are meeting with the agencies and other stakeholders that have jurisdiction over the project to understand your concerns and answer any questions you may have about the project. This information will be used to further refine our project and respond to the EMA's information request.

CariSal invites you to attend a project meeting on **Tuesday 13th February, 2007 from 1.30 pm to 3.30 pm at the NEC's offices** at Corner Rivulet and Factory Roads, Brechin Castle, Couva.

An agenda for the meeting is enclosed.

The CariSal management and environmental team look forward to your attendance and to hearing your comments and questions.

The favor of a reply is requested by Wednesday 7th February, 2007 in order to plan appropriately.

Thank you for your participation.

Best regards,

Varesha Besai

Chief Financial Officer

TTeK Project Management Limited

Tel: 679-1585

Cell: 355-7418

CARISAL STAKEHOLDER MEETING

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HAROLD BERTRAND	COUVA/PT. LISAS CHAM. OF COMMERCE	868-636-5017	NOT AVAILABLE
JOHN JONES	NEC	868-689-3384	jjones@ngc.co.tt

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[illegible]	[illegible]	[illegible]	mail copy of presentation
Roger Moore	CMSL		
CARLOS BERNAL	TTEK		
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EMERAL OREE	TTCAA	669-4302	eoree@caa.gov.tt (Request copy of presentation)
HAROLD BERTRAND	CPCC	6365017	Coast.vision chamber of Commerce
JOHN JONES	NEC	689-3384	jjones@ngc.co.tt
ABSENT			
Rosemary De Jour	T.C.P.	627-9700	rosemary.dejour@pd.gov.tt.

CARISAL STAKEHOLDER

NOTICE

You're invited to meet the **Carisal Team**

and

Learn about our **new** company

From "Waste to Retail"

Saturday **July 21**, 2007
at Caldrac Club
Railway Road Dow Village, California
4p.m.

Tuesday **July 24**, 2007
Phoenix Park Government School
Phoenix Park Road
5p.m.

July 24, 2007 public meeting information meeting – Phoenix Park Government School.

Invitation to Public Meeting – Dow Village

PUBLIC ENGAGEMENT MEETING

Pursuant to its application for a Certificate of Environmental Clearance (CEC) in accordance with the Environmental Management Act 2000, CariSal Limited is conducting a comprehensive Environmental Impact Assessment (EIA) Study for its proposed plant located south of the Pt. Lisas Industrial Estate.

As part of the EIA process, CariSal Limited will be hosting a public consultation meeting where the findings to date of its EIA will be presented and discussed with the public. CariSal Limited is looking forward to presenting this project to the community and receiving comments.

Saturday August 4, 2007
Caldrac Club
Railway Road
Dow Village, California
4p.m.

Members of the public are invited to attend

Attendance List for August 4 Public Engagement Meeting

PHONE	NAME OF ATTENDEE	COMPANY REPRESENTING	SIGNATURE
(1)	BRIAN B. BARRAN	#15 DOW VGE SETTLEMENT CALIFORNIA P.O. Box 960, Concord	Brian B. Barran
	Peter VINE	Self 762 4409 peter_vine@hotmail.com	
(2)	Savita Boodram	2144 Dow village california	Savita Boodram
	RAJINDRA BENNY	CCMS. Dow VILLAGE	
	MERISSA BENNY	SELF. DOW VILLAGE.	
	Andrew C Baine	No. 7 POLE AVE. PLAISANCE PIA-P/ 7686597	
	RYAN SANT	#Savonetta Estate	Ryan Sant
	Sam Paul	Dow Village	
	ANIL KAMAL	Dow Village	Anil Kamal
	Majeed Ali	Caldrac Club	Majeed Ali
	Shah Mohammed Ali	S.M. Enterprises Ltd	
	NOAH ALI		
	Hadeed ALI	Esperanza cricket Club	
	Errol Penny	Esperanza SPORTS	
	Mitra Chandoo		

CariSal Social Impact Community Meeting

Date: Sat. Nov. 3rd. '07

Name	Address/Community	Phone # (Optional)	Organisation(If Any)
1 SATNARINE PAUL	Dow Village	636 9889	Caldrac
2 Ramdeo Ramsaran	D.V.		
3 Moonia Behary	Piarco St		
4 Ken Fadoo	Vista Bella		Heating Organization
5 T [illegible]	Dow Village		
6 R. SANT	SAVONETTA		SANT'S EQUIPMENT
7 AZAD MOHAMMED	Dow Village	776-7547	Caribbean Stucco (cricket captain)
8 ANIL KAMAL	Hosein Street Dow 19	750-1925	CALDRAC Club.
9 Lennox Sankersingh	Couva	636-0658.	Sou Sou Land
10 ZARACK RATACK	California	748-5566 395-4343	Welder Fab.
11 SHERRIANN RAMIA	California	680-3607	
12 Roodal [illegible]	California	727-8445	
13 KISHEN BOODRAM	California	467-6895	
14 Shomel Calla	Cal. Tona	331-1258	CALDRAC CRICKET CAPTAIN
15 SANDISA SHAH	"	479-5507	" "
16 RAJINDRA BENNY	Dow Village	377-3761	CCNS.
17 AZAR Mohammed	Railway Road	679 [illegible]	Caldrac club.

18. Krishna Ramjattan · Railway Rd California

CariSal Social Impact Community Meeting

Date: Wed. Nov. 7th. '07

Name	*Address/Community*	*Phone # (Optional)*	*Organisation(If Any)*
1 Lennox Sinclair	Couva.	636-0658	Sou-Sou Land.
2 Sherry Ann Ramia	California	680-3607	
3 Moonia Behary	Pierrie St	737-7093	
4 ANIL KAMAL	Hobson St Bow Rig.	750-1925	CALDRAC
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This Notice appeared in the following publications on the stated dates.

The Daily Express – Thursday, January 3, 2008
The Daily Express – Friday, January 4, 2008
The Sunday Express – January 6, 2008
The Daily Express – Monday, January 7, 2008

CARISAL™ UNLIMITED

NOTICE OF PUBLIC MEETING

CariSal Unlimited has proposed to build a new chemical (chlor-alkali) plant across the Southern Main Road from the Yara (Hydro Agri) facility.

CariSal will be hosting a second public consultation to present findings of the Environmental Impact Assessment (EIA) and to learn about and respond to concerns raised by stakeholders.

Residents, other community members and other stakeholders from the **Pt. Lisas Industrial Estate, Savonetta Villas, Dow Village, Phoenix Park, California, Esperanza, Pranz** and the general public are invited to attend.

DATE: January 7th, 2008
TIME: 5 p.m. to 7 p.m.
PLACE: Caldrac Club
(Railway Road, Dow Village. California)

Proceedings from this meeting will be included as part of the Environmental Impact Assessment Report that CariSal Unlimited will submit to the Environmental Management Authority.

File Ref: OL-CSALGEN-0055

Attn: Mr. Wade Hamilton
Vice President – Technical Services

3rd January 2008

The National Gas Company of Trinidad and Tobago
Point Lisas,
Trinidad.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

The meeting is required by the final Terms of Reference (TOR) issued by the EMA in August of 2007. You may recall having received a copy of the draft TOR for review prior to that time. In the spirit of continuity of our CEC process, we hope that you will attend the meeting to hear the results of the EIA study as reported by our environmental consultants and to provide us with your valuable feedback on the findings.

We have planned the meeting for Monday 7th January 2008 from 5 to 7 p.m., at the Caldrac Club, in California. Light refreshments will be served.

We look forward to seeing you at the meeting and welcome lively participation. In the event that you cannot attend, please send a representative from your organization.

Directions to the Caldrac Club are as follows: From the Solomon Hochoy Highway: Exit at the Couva overpass and travel along the Rivulet road to the BC roundabout. Turn left at the roundabout and travel south along the Southern Main Road for about 2 kilometers until you approach a gasoline station on the right. Travel south from the gasoline station for about 50 meters to the first left turn on Railway Road, California. The Caldrac club is 200 meters from that junction on the left.

We would appreciate your efforts to confirm your attendance by the close of business on January 4th, but please attend even if you do not remember to RSVP.

★P.O. Box 7567, Claxton Bay, Trinidad, WI ★868.679.1585★Fax 868.679.1781★Email RogerMDMoore@carisal.biz★

Thank you for your considered attention to this request and we hope to see you at the meeting.

Yours faithfully,

Roger M.D. Moore
General Manager.

★P.O. Box 7567, Claxton Bay, Trinidad, WI ★868.679.1585★Fax 868.679.1781★Email RogerMDMoore@carisal.biz★

File Ref: OL-CSALGEN-0054

Attn: Mr. John Jones
Superintendent Engineering, Design & Construction

3rd January 2008

National Energy Corporation of Trinidad and Tobago (NEC)
Corner Factory & Rivulet Road,
Brechin Castle,
Couva.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0053

Attn: Mr. Kishon Singh
Manager – Health, Safety & Environment

3rd January 2008

Point Lisas Industrial Port Development Corporation Limited
PLIPDECO House
Orinoco Drive,
Atlantic Avenue,
Point Lisas.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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General Manager.

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File Ref: OL-CSALGEN-0052

Attn: Mr. Graham Thomas
Executive Director

3rd January 2008

EASI Industrial Supplies Limited
North Sea Drive,
Savonetta,
Couva.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0051

Attn: Mr. Peter Dowding
Business Development Manager

3rd January 2008

YARA Trinidad Limited
Southern Main Road,
Savonetta.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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File Ref: OL-CSALGEN-0050

Attn: Mrs. Benjamin
General Manager

3rd January 2008

National Agro Chemicals Limited
Cyrus Trace,
El Socorro Extension,
El Socorro.

Dear Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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File Ref: OL-CSALGEN-0049

Attn: Mr. Nigel Mohammed
Health, Safety and Security Officer

3rd January 2008

ANSA MCAL Chemicals Limited
North Sea Drive,
Point Lisas Industrial Estate,
Couva.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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File Ref: OL-CSALGEN-0048

Attn: Mr. Ryan Sant
Managing Director

3rd January 2008

Sant's Equipment Rentals Limited
North Sea Drive,
Point Lisas Industrial Estate,
Couva.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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File Ref: OL-CSALGEN-0048

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Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0047

Attn: Mr. Stephen Harris
Vice President – Health, Safety, Security & Environment

3rd January 2008

Phoenix Park Gas Processors Limited
Rio Grande Drive,
Point Lisas Industrial Estate,
Couva,
Trinidad, W.I.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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File Ref: OL-CSALGEN-0046

Attn: Mr. Doon Beepath

3rd January 2008

Chief Operating Officer
Industrial Gases Limited
North Sea Drive,
Point Lisas Industrial Estate,
Savonetta,
Couva.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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General Manager.

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File Ref: OL-CSALGEN-0045

Attn: The Director

3rd January 2008

Central Statistical Office
National Statistics Building,
80 Independence Square,
Port of Spain.

Dear Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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General Manager.

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File Ref: OL-CSALGEN-0044

Attn: The Director

3rd January 2008

The Office of Disaster Preparedness & Management
4A Orange Grove Road,
Tacarigua.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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File Ref: OL-CSALGEN-0044

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Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0043

Attn: The Director

3rd January 2008

The Ministry of Works and Transport
Maritime Services Division
2nd Floor ANSA House,
Corner Queen and Henry Street,
Port of Spain.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

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Roger M.D. Moore
General Manager.

★P.O. Box 7567, Claxton Bay, Trinidad, WI ★868.679.1585★Fax 868.679.1781★Email RogerMDMoore@carisal.biz★

File Ref: OL-CSALGEN-0042

Attn: The Permanent Secretary

3rd Januarv 2008

The Ministry of Agriculture, Land and Marine resources
Land and Surveys Division
118 Frederick Street,
Port of Spain.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

The meeting is required by the final Terms of Reference (TOR) issued by the EMA in August of 2007. You may recall having received a copy of the draft TOR for review prior to that time. In the spirit of continuity of our CEC process, we hope that you will attend the meeting to hear the results of the EIA study as reported by our environmental consultants and to provide us with your valuable feedback on the findings.

We have planned the meeting for Monday 7th January 2008 from 5 to 7 p.m., at the Caldrac Club, in California. Light refreshments will be served.

We look forward to seeing you at the meeting and welcome lively participation. In the event that you cannot attend, please send a representative from your organization.

Directions to the Caldrac Club are as follows: From the Solomon Hochoy Highway: Exit at the Couva overpass and travel along the Rivulet road to the BC roundabout. Turn left at the roundabout and travel south along the Southern Main Road for about 2 kilometers until you approach a gasoline station on the right. Travel south from the gasoline station for about 50 meters to the first left turn on Railway Road, California. The Caldrac club is 200 meters from that junction on the left.

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File Ref: OL-CSALGEN-0042

We would appreciate your efforts to confirm your attendance by the close of business on January 4th, but please attend even if you do not remember to RSVP.

Thank you for your considered attention to this request and we hope to see you at the meeting.

Yours faithfully,

Roger M.D. Moore
General Manager.

★P.O. Box 7567, Claxton Bay, Trinidad, WI ★868.679.1585★Fax 868.679.1781★Email RogerMDMoore@carisal.biz★

File Ref: OL-CSALGEN-0041

Attn: The Controller of Customs & Excise

3rd January 2008

Customs and Excise Division
Corner Abercromby and Independence Square
Port of Spain.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

The meeting is required by the final Terms of Reference (TOR) issued by the EMA in August of 2007. You may recall having received a copy of the draft TOR for review prior to that time. In the spirit of continuity of our CEC process, we hope that you will attend the meeting to hear the results of the EIA study as reported by our environmental consultants and to provide us with your valuable feedback on the findings.

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Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0040

Attn: The Permanent Secretary

3rd January 2008

The Ministry of Agriculture, Land & Marine Resources
Fisheries Division
St Clair Circle,
St Clair,
P.O. Box 389

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0040

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Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0039

Attn: The Permanent Secretary

3rd January 2008

The Ministry of Community Development, Culture & Gender Affairs
ALGICO Bldg,
Jerningham Avenue,
Belmont,
Port of Spain,
Trinidad.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0038

Attn: The Permanent Secretary

3rd January 2008

The Ministry of Agriculture, Land & Marine Resources
St Clair Circle,
St Clair,
P.O. Box 389

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0037

Attn: The Director

3rd Januarv 2008

The Institute of Marine Affairs
Hilltop Lane,
Chaguaramas,
Trinidad.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0036

Attn: The Permanent Secretary

3rd Januarv 2008

The Ministry of Public Utilities & the Environment
16 – 18 Sackville Street,
Port of Spain,
Trinidad.

Dear Sir/Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0035

Attn: Mr. Junior Dell

3rd January 2008

The Ministry of Works and Transport
Corner Richmond and London Streets,
Port of Spain,
Trinidad.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0035

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Thank you for your considered attention to this request and we hope to see you at the meeting.

Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0034

Attn: Mr. Adrian Clarke

3rd January 2008

The Ministry of Labour, Small & Micro Enterprise Development
Corner Duncan Street and Independence Square,
Port of Spain,
Trinidad.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0034

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Thank you for your considered attention to this request and we hope to see you at the meeting.

Yours faithfully,

Roger M.D. Moore
General Manager.

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File Ref: OL-CSALGEN-0033

Ms. Cezanne Chang
Health & Safety Officer 1

3rd Januarv 2008

Occupational Health & Safety Unit of
The Ministry of Labour, Small & Micro Enterprise Development
Corner Duncan Street and Independence Square,
Port of Spain,
Trinidad.

Dear Madam:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0033

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Thank you for your considered attention to this request and we hope to see you at the meeting.

Yours faithfully,

Roger M.D. Moore
General Manager.

★P.O. Box 7567, Claxton Bay, Trinidad, WI ★868.679.1585★Fax 868.679.1781★Email RogerMDMoore@carisal.biz★

File Ref: OL-CSALGEN-0056

Attn: Mr. John Thompson
General Manager

3rd January 2008

Desalination Company of Trinidad and Tobago
Pacific Avenue at Maracaibo Drive,
Point Lisas Industrial Estate,
Couva.

Dear Sir:

Re: Public Consultation for the CariSal Unlimited Chlor-Alkali Plant proposed for Pt. Lisas, Couva, Trinidad

CariSal Unlimited would like to invite you to participate in our public meeting to discuss the findings of the Environmental Impact Assessment report for its proposed Chlor-alkali project at Pt. Lisas, Trinidad.

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File Ref: OL-CSALGEN-0056

Thank you for your considered attention to this request and we hope to see you at the meeting.

Yours faithfully,

Roger M.D. Moore
General Manager.

★P.O. Box 7567, Claxton Bay, Trinidad, WI ★868.679.1585★Fax 868.679.1781★Email RogerMDMoore@carisal.biz★

Attendance Sheet – January 7, 2008 meeting.

NAME	COMPANY	EMAIL ADDRESS
F BABOOLAL	PPPL	fra_b14@hotmail.com
KHANISHA SALIM	DESALCOTT	khanisha.salim@desalcott.com
ANIL RAMPERSAD	TTEK	anil.rampersad@ttek-pm.com
Chuck Sander	TTeK	csander@epm.cc
GINO ZAPPIA	TTeK	GFZAPPIA@TTek-PM.com
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
ANDREW C BAIN	INVENTIONS PLUS LTD	No. 7 - PEAL AVENUE PLEASANT PK. TK8059
BRIAN B. BARRAN	#15 Don Vige Settlement California	626-1470 Home.
Shah Mohammed	S.M. Enterprises Ltd.	782-8265 nitro@tstt.net.tt
AZAD MOHAMMED	Current Premium broilers	Railway Road Caligrova
Donna Ramkissoon	NGC	donna_ramkissoon@ngc.co.tt
KHIRON WILLIAMS	NGC	Khiron_Williams@ngc.co.tt
[illegible]	[illegible]	[illegible]
ALI [illegible]	[illegible]	[illegible]
Bindu Ramsoo		cramsoon@hotmail.com.
R. Sant	Resident Savonette	—
D. Ramkissoon	—	—
D. Puran	—	kiranpuran@hotmail.com
S. Paul	California	
RYAN BESAI	TTEK	ryan.besai@ttek-pm.com
[illegible]	[illegible]	[illegible]
BISHAM "Q" DOOKHI	Self employed.	DOOKIE@TSTT.NET.TT.
ANIL KAMAL	CALDRAC	ANIL_KAMAL@Hotmail.com
Ramsoom Jadoonanan	Company Sol Standing odor F.S.B. Canva M.B.T.M.B.	Pow Village New Settlement. California Lot 17. F.S.B Canva house address Ramsoom-99999952

NAME	COMPANY	EMAIL ADDRESS
NIGEL MOHAMMED	AMCL	nigel.mohammed@ansamcal.com
ROBERT MOHAMMED	AMCL	robert.mohammed@ansamcal.com
JAMEEL AMEERALI	ANSAMCL	jameel.ameerali@ansamcal.com
Jennifer-Anna		
Stacey-Louis		
Moonilal Maharaj	—	145 Dunfries Rd. Hermitage Village, Sat. Co.
Rajindra Benny	CCMS (Community Group)	rajjen@tstt.net.tt
SHERIN BABOORAM	CALDRAC	
Abdulla Amjad		
Stephen Andrews	~~Clarion Bay~~	stephen_andrews2001@yahoo.com
Ramadeo Persad	Pramz Gardens	Pramz Gardens
. MATHURA	NGC	lindum@ngc.co.tt
C. Seetaram		
. Seetaram		

Newsletters

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CARISAL

NEWSLETTER

CariSal Limited is a new US$130 million Chemical facility that will be built on the extended Point Lisas Industrial Estate, directly opposite YARA but on the eastern side of the Southern Main Road. The company will produce primarily 100,000 tonnes per year of Caustic Soda and 125,000 tonnes per year of Calcium Chloride and will be on stream by December 2008. Actual construction work should begin in December 2007, but the clearing of the grass and shrubs and partial grading of less than 2 hectares of the site to accommodate temporary site offices could begin in August 2007.

CariSal's principal shareholders include Guardian Energy Holdings Limited (Trinidad) and Seneca Chemicals, a US Limited Liability Company that holds marketing, technology and manufacturing knowledge in the calcium chloride industry.

CariSal will process a waste by-product salt stream from the desalination plant at Point Lisas, Desalcott, to provide the raw feed to the Plant and will produce the primary products mentioned above, along with Bleach, Hydrochloric Acid, Food-Grade Salt and high-quality Distilled Water.

CariSal has signed a Letter of Intent with Brenntag, the world's largest chemical distributor, to market and sell Hydrochloric Acid, Calcium Chloride and other products into Latin America. Brenntag intends to move all of the Hydrochloric Acid available for export.

The company has established a marketing alliance with DX Terminals Limited of Houston, Texas, to market its Caustic Soda internationally. A similar arrangement was made with CariSal LLC, a US-based Ice-Melt company, to market the Calcium Chloride for ice-melt applications and also for the oil-field industry and for road stabilization purposes. EASI Industries Limited (Trinidad) will market and distribute Caustic Soda locally.

Finally, CariSal is negotiating an agreement with the Water and Sewerage Authority (WASA), to supply the high quality distilled water to the industrial estate, to free-up an equivalent amount of potable water (currently being used for industrial applications) for human consumption.

3 Pelham Street, Port of Spain, Trinidad, WI 868.621.0134 Fax 868.679.1781 Email RogerMDMoore@carisal.biz

The process will employ state-of-the-art technology to ensure a clean and healthy environment at all times with almost zero waste. The carbon dioxide that will be discharged will be partially consumed by a lemon orchard plantation in a process called sequestering. Over time, efforts will continually be directed towards elimination of all carbon dioxide emissions from the Plant. In that regard, arrangements have already been made with a proposed new Ammonia/Urea Plant to consume the remaining carbon dioxide.

CariSal will employ 75 nationals on a permanent basis and an average of 150 contractor personnel will be on site for the 12 months of construction.

Contact Info:
Roger Moore, Phone # 868 621 0134; E-mail: rogermdmoore@carisal.biz
or Dick Lietzau, E-mail: dlietzau@carisal.biz

December 10, 2007

Friends of CariSal,

We are late in providing an update, but the last few months have been challenging to say the least. Below is a venture status update. We intend to provide our potential customers an update on a quarterly basis or following a major event.

CariSal Site in Point Lisas

The CariSal Venture converts three fundamental substances, sea water, lime stone and salt into calcium chloride, caustic soda and a proprietary ice-melt product, ClearPath™. A total of $175 million will be invested, $170 million on the island of Trinidad, in the Republic of Trinidad and Tobago, and $5 million in three major US metropolitan areas.

The Business Case

This business plan is based on leveraging the low-cost position of producing calcium chloride in Trinidad to provide raw material for the ClearPath™ manufacturing operation in the US allowing for rapid penetration of the ice-melt market by expanding CariSal's impact and reach. In addition, CariSal will also use this cost position, access to deep water ports and proximity to the Caribbean, West Africa and Latin America to gain a dominant share of the 94% calcium chloride supplied to the oil service market in these regions. The products and annual volumes to be produced in Trinidad include:

- 105,000 MT annually calcium chloride
- 100,000 MT annually caustic soda
- 8,000 MT annually sodium hypochlorite (bleach) for local consumption - there is potential to expand into this market in the lower Caribbean. Import compelled pricing is quite attractive
- 1,000 – 2,500 MT annually hydrochloric acid (depending on product mix)

Trinidad is an ideal location for this capital investment for several key reasons including availability of low-cost electricity and natural gas, access to deep sea ports for export and proximity to export markets. The local market in Trinidad will generate approximately $15 million in revenue from displacement of imports, with the balance of the product slate to be exported. Trinidad is strategic for caustic soda because of the proximity to the trading routes between the United States and Latin America and Europe and Latin America. In addition, a plant in Trinidad allows us to ship to the other CARICOM islands duty-free and at a lower price than competition.

Government Approvals:

- CariSal attained approval by the Natural Gas Export Task force in June 2006
- received Cabinet approval in September 2006
- Was provided a 11.8 Hectare site in November 2006
- CariSal is in the process of obtaining a Certificate of Environmental Clearance (CEC) from the Environmental Management Authority of the Republic of Trinidad and Tobago. The CEC is expected to be received in March 08.

Investors:

CariSal Holdings Limited is a St Lucia Corporation with principal shareholders:

- Guardian Energy Holdings Limited, an investment fund specializing in supporting Caribbean energy projects
- Seneca Chemical, a US Limited Liability Company holds marketing, proprietary technology and manufacturing knowledge in the Calcium Chloride and ice-melt industries
- INNOVONE INVESTMENTS LTD of Trinidad and Tobago (INNOVAONE) a Trinidad investment company, specializing in bringing new technologies and innovations to Trinidad and Tobago
- TTeK Project Management Services Limited, Port of Spain, Trinidad
- NYT, LLC

Financial:

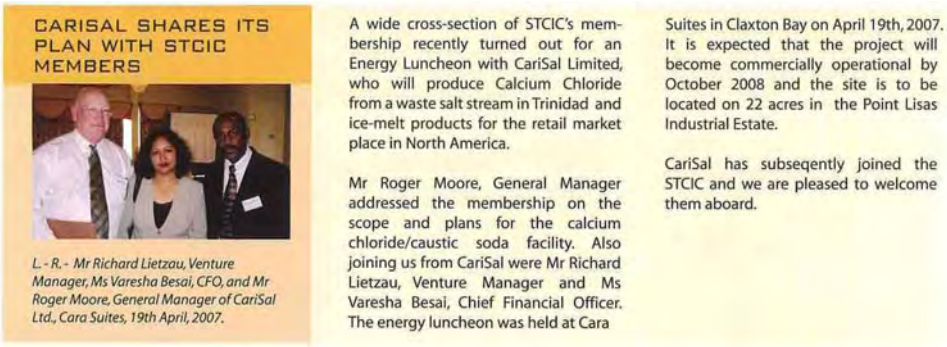
A second round of equity solicitation was opened in July. A total of $5,450,000 additional capital has been raised to-date versus a target of $10 million. Guardian Energy Holdings, our major equity holder, subscribed to an additional $5 million, EASI our local caustic distribution partners subscribed for $250,000, and two of our original investors contributed another $100,000. To-date, we have raised $11.5 million in common equity and need about $12 million additional to complete. In addition we have signed a mandate for the senior debt ($122.75 million) with Royal Bank of Trinidad and Tobago and expect to reach financial close end January. The venture also intends to raise $30 million in mezzanine or preference debt, $10 million is expected to be spoken for within the next two weeks.

The equity/financing plan is slightly behind schedule, but we expect to close the gap before year end. We have established great relationships with all our suppliers and contractors to work with us to maintain our aggressive schedule. Guardian, our main shareholder has been a great supporter during this time of trial. No one ever said this would be easy. Here is the latest:

- We are discussing potential investment with several caustic producers and distributers. There continues to be strong interest in the venture. We expect to complete $12 million in additional common required to reach financial closing in late January 08.
- UTC (Unit Trust Corporation) is one of the Trinidad Government firms that is responsible for investment of their social security funds. UTC will take a proposal for preference

shares to their board on Monday, next week. We believe this is $8-10 million. The National Insurance Board is also interested and will decide on investment in January.

- CariSal selected Conve&AVS (CAVS), as our Engineering and Fabrication contractor for the chlor-alkali plant. CAVS completed the front end engineering in August and CariSal and CAVS signed an agreement for engineering, procurement and module fabrication in October
- Commonwealth Engineering and Construction, Houston signed an agreement with CariSal to provide engineering and procurement for the calcium chloride, utilities and offsite facilities in September.
- The Government is very positive on this development as it is the first truly "Green" chemical manufacturing facility on the island, and perhaps in the world. We have received fiscal incentives from the Ministry of Trade including waiver of duty on all imported equipment and materials.
- CariSal has been accepted into the Chloride institute and the South Area Chamber of Commerce of Trinidad and Tobago.



CARISAL SHARES ITS PLAN WITH STCIC MEMBERS

L.-R.- Mr Richard Lietzau, Venture Manager, Ms Varesha Besai, CFO, and Mr Roger Moore, General Manager of CariSal Ltd., Cara Suites, 19th April, 2007.

A wide cross-section of STCIC's membership recently turned out for an Energy Luncheon with CariSal Limited, who will produce Calcium Chloride from a waste salt stream in Trinidad and ice-melt products for the retail market place in North America.

Mr Roger Moore, General Manager addressed the membership on the scope and plans for the calcium chloride/caustic soda facility. Also joining us from CariSal were Mr Richard Lietzau, Venture Manager and Ms Varesha Besai, Chief Financial Officer. The energy luncheon was held at Cara Suites in Claxton Bay on April 19th, 2007. It is expected that the project will become commercially operational by October 2008 and the site is to be located on 22 acres in the Point Lisas Industrial Estate.

CariSal has subseqently joined the STCIC and we are pleased to welcome them aboard.

Venture:

Company Structure

The combination of CariSal, LLC a US Limited Liability Company producing proprietary ClearPath™ Premium ice melt and CariSal Limited the Trinidad calcium chloride and caustic manufacturing facility was completed via a stock swap in August under CariSal Holdings Limited, a Saint Lucia company. Further to that transaction and to facilitate consideration of the US taxing authorities as a "partnership", the CariSal Trinidad was changed to an "Unlimited Company". The new name is CariSal Unlimited. CariSal Holdings (St. Lucia) holds all the assets of both operating companies. The board of the Saint Lucia company is responsible for the management and oversight of the venture.

CariSal Unlimited

Project has 395 days (from project commencement thru November 30, 2007) and 42,480 hours without a LTI or OSHA Recordable

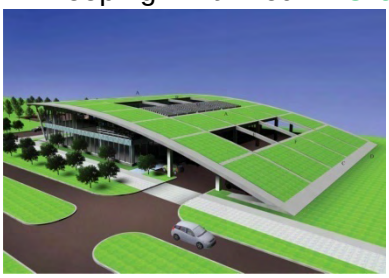
The venture continues to operate with zero injuries or incidents.

Environmental

The Environmental Impact Assessment (EIA) required for obtaining a Certificate of Environmental Clearance (CEC) necessary to start construction is being completed with submission expected in December. The study required by the Environmental Management Authority of Trinidad turned out to be much more extensive that originally anticipated including ambient air monitoring to establish background levels of anticipated emissions. We expect to submit a very professional document consistent with the CariSal standard for excellence.

As part of CariSal's outreach program, Roger Moore, General Manager has held several meetings and forums with the local community both residential and industrial. The outcome of these meetings has been extremely positive. Roger is continuing the communication by holding learning forums with the local schools.

In keeping with our "Green by Design" commitment, the team commissioned **demian\wilbur** architects. The CariSal Administration facility design concepts are envisioned to exemplify green building principles and sustainable development standards representative of CariSal's eco friendly corporate initiative.



The site layout being proposed is a two level courtyard building with a west facing entrance. The entrance overhang will shade the western elevation through mid-day with low angle solar gain protection via landscape plantings in the afternoon. The glazed areas on the south and east elevations will be shaded by additional landscape plantings and a trellised green roof over the east parking areas..

Landscape design elements proposed address the use of the site to mitigate the impact of the industrial structures on the surrounding areas. Key elements include:

- walking/bicycle/electric cart paths linking the perimeter access control points with the administration facility and the main plant to reduce internal automobile emissions.
- grass roof and covered parking areas to reduce heat island impact and promote surface water retention.
- CO_2 absorbing tree orchard
- rain water recycling , earth berms and surface water retention swales.
- solar operated site lighting and electric cart charging stations

Commercial

Supply Agreements

The final agreement is in place for natural gas supply, and final drafts are being negotiated for electrical, brine supply, port usage, caustic storage and limestone supply.

Offtake Agreements

Agreements for caustic soda offtake are being discussed with caustic producers, consumers and distributers any one of which can consume the entire plant output. The objective is to put a three to five year agreement in place to secure sale of caustic necessary to obtain financial close at a reasonable net back. In addition, EASI Limited has signed up to distribute caustic soda locally (6 to 8 metric tons annually).

Discussions are being held with energy service companies to place the 94% calcium chloride prior to start up. We expect to put "strawman" proposals in front of the two majors in December.

The brine supply agreement with DESALCOTT contains a clause to incentivize purchase of sodium hypochlorite (bleach).

The sales team is also working on a plan to ensure production of caustic soda is not constrained by sales of the "chloride" products.

Please be advised that the new mailing address for CariSal Unlimited will now be:

c/o TTeK Project Management Limited
P.O. Box 7568,
Claxton Bay,
Trinidad, W.I.

CariSal's Team is growing to meet the increased demands for venture support. The Organization now includes:

CariSal Limited (Saint Lucia) Corporation:

Richard Lietzau, Venture Manager
Tom McGonigle, President
Pat Thomas, VP international sales
Tim Campbell, Manager IT & Systems
Scott Hansen, Plant Engineer – ClearPath™
Royce Peiser, VP Industrial Chemicals (Houston)

CariSal Unlimited

Roger Moore, General Manager
Varesha Besai, CFO
Judy Mohammed, Assistant Accountant
Lydia Baboolal, Administrative Assistant
Gerald Rawlins, HSE Manager
Ryan Besai, Project Engineer
Herdis Lee Chee, Procurement/Materials Coordinator
Radhica Haniff, Document Control
Vaneeta Ticklal, Accountant

Project Summary:

TTeK Project Management Limited is responsible for overall project management and construction of the facility.

Conve & AVS Inc., Miami, Florida has been awarded the engineering and fabrication of the Chlor-Alkali Plant which will utilize INEOS BICHLOR™ electrolyzers.

The contract with ABT Engineers & Constructors Limited, has been closed, work was completed as at the end of September.

Commonwealth Engineering and Construction in Houston Texas, US has been awarded the Detail Engineering and Procurement for the balance of the plant.

The Project has completed the FEED phase of the Engineering. Detailed Engineering and Procurement of all phases of the project has commenced.

CAVS has begun purchasing critical equipment for the Chlor Alkali facility in preparation to begin fabrication of process modules. Project HAZOP is scheduled for January 2008.

DaCosta Gwendoline – The Environmental Solutions Company, Ltd and ICF are completing the Environmental Impact Assessment to be submitted in mid-December.

Dismantling of the equipment at the Manistee 94% Calcium Chloride site is complete. Equipment continues to be refurbished and made ready for shipment to site.

Temporary site offices and lay down area has been completed. The team is preparing to relocate to the new offices later this month.

ClearPath™

Production was restarted in September for the 07-08 winter season. The plant is producing ClearPath™ Premium and Professional grade ice melt. After working through some restart challenges the plant is operating near capacity. *We are also packaging calcium chloride flake to customers that want a split shipment.*

In spite of the recent warm weather in the Northeast, marketing has had three significant accomplishments:

1. CariSal is in Sam's Club/Wal-mart system and John Deere/Lesco system as an approved supplier (half the battle)
2. Inclusion in the Symbiot distribution network
3. Shipped the first order of high-margin pails to McDonald's.

The current, early snow will enable our sales team to push the product into the market. Our goal is to sell 1,000 tons in December. The sales team:

- Will focus on professional and retail segments this year with focus on education and proof of performance
- Selectively push product into the Chicago market to begin branding for expanded sales in 2008/09
- Plan for next year (2008/09) to include state governments as high volume targets by pursuing product trials. We are currently talking with the State if Pennsylvania and Massachusetts Departments of Transportation

Order traffic is picking up and initial feedback from the marketplace has been very positive.

Comments on TOR

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TOR RESPONDENTS - July 18th 2007

NAME	TITLE	COMPANY	COMPANY ADDRESS	TELEPHONE CONTACT
Dr. Reeza Mohammed	Environmental Projects Coordinator	NEC	Rivulet & Fatory Road, Couva.	636-8471
Mr. Prakash Saith	Chief Executive Officer	NEC	Rivulet & Fatory Road, Couva.	636-8471
Mr. Nicholas Seepersad	Manager - Health, Safety, Security & Environment	PLIPDECO	PLIPDECO House Orinoco Drive, Atlantic Avenue, Point Lisas.	636-2201
Mr. Rampersad Mootilal	Chief Executive Officer	MHTL	Atlantic Avenue, Point Lisas.	636-2906
Mr. Frank Look Kin	President	NGC	Orinoco Drive, Point Lisas Industrial Estate.	636-4662
Mr. Stephen Harris	Manager - Health, Safety, Security and Environment	PPGPL	Rio Grande Drive, Point Lisas Industrial Estate	636-1522
Mr. Mark Loquan	President	YARA	Savonetta Main Road, Point Lisas	636-2020
Mr. Mario Amos	Head - Environmental Health & Safet	ESSAR	D 205/206 Atlantic Plaza, Atlantic Avenue, Point Lisas	636-2119
Mr. Anthony Aleong	Asst. General Manager - Engineering	T&TEC	#7 Uriah Butler Highway, Mt. Hope	663-4060
Mr. Roger Karim	Manager - Environment & Regulatory Compliance	WASA	Farm Road, St. Joseph.	662-2302 ext. 2033
Mr. Graham Thomas	Executive Director	EASI Industrial Supplies Ltd	North Sea Drive, Savonetta, Point Lisas.	636-3111
Mr. John Thompson	General Manager	Desalcott	Pacific Avenue at Maracaibo Drive, Point Lisas Industrial Estate.	636-3725
Mr.Thackwray Driver	Chief Executive Oficer	South Trinidad Chamber of Industry & Commerce	Suite 313 Cross Crossing Shopping Plaza, San Fernando	652-5613
Mr. Howard Nelson		ASA Wright Nature Centre	7 ¾ MI Blanchisseuse Road	667-4655
Dr. Chan Yang		Chemistry Department - UWI	St Augustine Campus, St Augustine	662-2002 Ext 3546
Dr. Fletcher	Director	Water Resources Agency within W.A.S.A.	Farm Road, St Joseph	662-2202 Ext 3800
Mr. Ray Brathwaite	Executive Chairman	SWMCOL	34 Independence Square, Port of Spain	625-6678, Ext.256
Mr. Adrian Clarke		Ministry of Labour		764-9962
Mr. Junior Dell		Minisry of Works		727-4320
Mr. Pooran Ramlal	Principal Madical Officer	Couva/Tabaquite/Talparo Regional Corporation	Railway Road, Couva.	687-9144
Mr. Michael Rishi Baldeo		Ministry of Energy	116 Frederick Street, P.O.S.	625-7015 Ext 345
Mr. Leslie Skeete	Acting Chief Fire Officer	Fire Services Headquarters	Wrightson Road, P.O.S.	623-8463
Mr. Christian Quesnell	Managing Director	Resin Converters Limited	69-72 Frederick Settlement, Industrial	645-0235
Chief Fire Officer		Couva Fire Station	Couva	

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The Council of Presidents of the Environment
77B Saddle Road, Maraval
P.O. Box 1381,
Port of Spain
Republic of Trinidad and Tobago
Tel/Fax: (868) 628-0969
Email: cope@tstt.net.tt, info@cope.org, Website: www.cope.org.tt

28th August, 2007

Mr. Roger Moore
General Manager
CariSal Limited
3 Pelham Street,
Port of Spain.

Re: CariSal TOR

Dear Mr. Moore,

Please find attached a copy of the COPE comments on the Draft Terms of Reference for the Environmental Impact Assessment in respect of CEC 1743/2006- Application for a Certificate of Environmental Clearance (CEC) by CariSal Limited for a chlor-alkali plant and associated infrastructure at Point Lisas.

Regards,
Shauna Narine

Shauna Narine

Project Officer
COPE

•Asa Wright Nature Centre • Caribbean Forest Conservation Association • Centre for Rescue of Endangered Species of Trinidad & Tobago • Environment Tobago • Friends of the Botanic Gardens • Horticultural Society of Trinidad & Tobago • Pointe-a-Pierre Wild Fowl Trust • Stakeholders Against Destruction for Toco • Trinidad & Tobago Field Naturalists' Club • Trinidad & Tobago Orchid Society • UWI Biological Society • Wildlife Orphanage and Rescue Centre • Zoological Society of Trinidad & Tobago •

Project Description

- Please include alternatives to subjective plans such as the transfer of the distilled water which is subject to the approval of WASA however if the quality of the water does not meet there standards what is an alternative for this water.

- Description of the rain water collection and recycling project to include possible impacts to the land due to lack of hydration a natural occurrence.

- Include a detailed maintenance plan for the subsidiary equipment such as the storage tanks and pipe lines in the long term.

- In the project schedule include the duration of phase of the project.

2.3.1 Physical Environment

- Please indicate the location of the wind direction in specific relation to the residential settlements.

2.5 Socioeconomic

- Include in demographic study the high risk members of the society (pregnant women and children) with in the area who may be particularly susceptible to minute changes in air quality and health.

- In the risk management plan include factors to contain entry of these soluble compounds into water supply ($CaCl_2$, HCl etc.)

The Council of Presidents of the Environment
77B Saddle Road, Maraval
P.O. Box 1381,
Port of Spain
Republic of Trinidad and Tobago
Tel/Fax: (868) 628-0969
Email: cops@tstt.net.tt, info@cope.org, Website: www.cope.org.tt

28th August, 2007

Mr. Roger Moore
General Manager
CariSal Limited
3 Pelham Street,
Port of Spain.

Re: CariSal TOR

Project Description

- Please include alternatives to subjective plans such as the transfer of the distilled water which is subject to the approval of WASA however if the quality of the water does not meet there standards what is an alternative for this water.
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- In the project schedule include the duration of phase of the project.

2.3.1 Physical Environment

- Please indicate the location of the wind direction in specific relation to the residential settlements.

•Asa Wright Nature Centre • Caribbean Forest Conservation Association • Centre for Rescue of Endangered Species of Trinidad & Tobago • Environment Tobago • Friends of the Botanic Gardens • Horticultural Society of Trinidad & Tobago • Pointe-a-Pierre Wild Fowl Trust • Stakeholders Against Destruction for Toco • Trinidad & Tobago Field Naturalists' Club • Trinidad & Tobago Orchid Society • UWI Biological Society • Wildlife Orphanage and Rescue Centre • Zoological Society of Trinidad & Tobago •

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28 AUG 2007

2.5 Socioeconomic

- Include in demographic study the high risk members of the society (pregnant women and children) with in the area who may be particularly susceptible to minute changes in air quality and health.

- In the risk management plan include factors to contain entry of these soluble compounds into water supply ($CaCl_2$, HCl etc.)

Respectfully,
Members of COPE.

•Asa Wright Nature Centre • Caribbean Forest Conservation Association • Centre for Rescue of Endangered Species of Trinidad & Tobago • Environment Tobago • Friends of the Botanic Gardens • Horticultural Society of Trinidad & Tobago • Pointe-a-Pierre Wild Fowl Trust • Stakeholders Against Destruction for Toco - Trinidad & Tobago Field Naturalists' Club • Trinidad & Tobago Orchid Society • UWI Biological Society • Wildlife Orphanage and Rescue Centre • Zoological Society of Trinidad & Tobago •

Desalcott
Pacific Avenue at Maracaibo Drive,
Point Lisas Industrial Estate,
Point Lisas, Trinidad, West Indies.
Tel: 868-636- 3725 Fax: 868-636-5032

2007 July 27

Mr. Roger Moore
General Manager
CariSal
3 Pelham Street
PORT OF SPAIN

Dear Sir,

RE: CARISAL - DRAFT TERMS OF REFERENCE

With reference to your letter of 2007 July 18, please note our comments on the draft Terms of Reference (TOR):-

SECTION IN DOCUMENT: **2.1- STUDY AREA**

SUGGESTION:

- To include the spatial outline of the proposed study area in relation to Desalcott, TEIL and EASI industries. This will give a holistic overview of those stakeholders in relation to the study area.

SECTION IN DOCUMENT: **2.2 DESCRIPTION OF THE PROJECT**

SUGGESTION:

- Flow diagram of operational processes should be included to show linkages between processes and facilitate better comprehension of all processes and their interactions.
- Identify approximate quantity of hazardous and non hazardous materials that will be stored on site during normal plant operations.

SECTION IN DOCUMENT: **2.3 DESCRIPTION OF THE ENVIRONMENT**

SUGGESTION:

- Section 2.3.1 PHYSICAL ENVIRONMENT should include (in the sub section Climate, Air quality and Noise) the ambient monitoring of CO,

NO_X, VOC's SO_2 and chlorine to determine potential changes in air quality prior to establishment of the proposed plant.

- Section 2.3.1 PHYSICAL ENVIRONMENT should include (in the aquatic environment sub section) monitoring of additional parameters such as Chemical Oxygen Demand and DO.

SECTION IN DOCUMENT: **2.5 DETERMINATION OF THE POTENTIAL IMPACTS OF THE PROPOSED PROJECT**

SUGGESTION:

- The risk assessment should also investigate the likelihood of rupture, leaks or corrosion of brine pipeline from Desalcott to the proposed site. Measures to deal with such events should also be addressed.
- One hazard to be considered is fugitive emissions or accidental releases from other plants in the vicinity of proposed area and contingency measures to deal with such emissions.

OTHER CONSIDERATIONS:

Of the three sources of water to CariSal's operations, the major source is from Desalcott (page 3 of document).

- How does CariSal plan to deal with instances of zero brine flow or reduced brine flow from Desalcott for example during planned and/or unplanned shutdowns?

Hope our comments are helpful in your application with the EMA.

Yours truly,
DESALINATION COMPANY OF TRINIDAD AND TOBAGO LIMITED

John. D. Thompson
General Manager

FAXED
JUL 27 2007
#Pages 2

Easi Industrial Supplies Limited
P.O. Bag 22, Couva P.O.,
Couva, Trinidad, W.I.
TEL : 1-(868) 636 3111
Fax : 1-(868) 636 7977

Carisal
3 Pelham Street
Port of Spain
Trinidad,
W.I.

Attention: Roger Moore / General Manager

July 26, 2006

Dear Mr. Roger Moore,

Here are our suggestions and corrections for the "Draft TOR process":

1. Page 2 of TOR reads: "Caustic soda (estimated at 100,000 mt/yr) would be converted into bleach 8,000 mt/yr)". This statement implies that all caustic soda produced (100,000 mt/yr) will be converted to bleach. It does not clearly indicate that there will be a surplus of caustic soda estimated at 100,000 mt/yr that will displace imported caustic soda and have a balance beyond that to export.

2. Page 4 of TOR should correct Easi Industries (3 times) to Easi Industrial Supplies Limited.

3. Page 4 of TOR should correct Easi to EISL (2 times)

4. Page 4 of TOR should correct the following " Easi Industries has been in the business of handling and storing caustic soda for over 40 years" to Easi Industrial Supplies Limited has been storing, handling and distributing a continuous supply of caustic soda to the local market since its establishment in 1970.

If you have any questions, please call me at the office 636 3111 or on my cell 742 4090.

Sincerely,

Graham Thomas
Easi Industrial Supplies Limited

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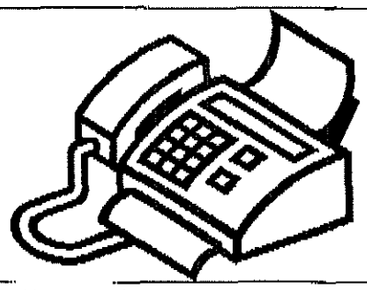
26 JUL 2007



FAX

ESSAR STEEL CARIBBEAN LTD
Atlantic Plaza, Level 2
Point Lisas, Trinidad

Tel (868)-679-2119
Fax: (868)-679-5228

To: Mr. Roger Moore
General Manager
CariSal Ltd. of T&T
Fax number: (868) 679-1781
Tel number: (868) 621-0134

Date: 7/30/2007

Number of pages (including this cover page): 2

From: Mario Amos

Re: Ref # CEC 1743 / 2006 – Application for a CEC by CariSal Ltd of T&T for the establishment of a Calcium Chloride Plant, Pt. Lisas.

Dear Sir,

Please see attached, correspondence as per subject at caption.

If there are any further queries, kindly contact us.

Best regards,
Mario Amos
(Head – Environment, Health & Safety)

Essar Steel Caribbean Limited

ESSAR

D-205/206, Atlantic Plaza,
Atlantic Avenue, Point Lisas, Couva
TRINIDAD & TOBAGO.
Phone : +1-868 679 2119
Fax : +1-868 679 5228
Visit us at www.essar.com

2007, July 30th

Mr. Roger Moore
General Manager
CariSal Limited of T&T
#3 Pelham Street,
Port of Spain,
Trinidad, WI.

Dear Sir,

Re: Reference No. CEC1743/2006 – Application for a Certificate of Environmental Clearance (CEC) by CariSal Limited of Trinidad and Tobago for the establishment of a Calcium Chloride Plant, Point Lisas.

Essar Steel Caribbean Limited (ESCL) acknowledges receipt of your letter dated July 18th, 2007 inviting comments (if any) from us as key stakeholders on the Draft Terms of Reference (TOR) issued by the Environmental Management Authority (EMA). We have reviewed the Draft TOR as requested within the limited time available and developed the following comment:-

- ESCL will like to have included in Section 2.5 "Determination of Potential Impacts of Proposed Project" information related to the potential impact of gaseous emissions upon the infrastructure, raw materials and finished product of ESCL and other planned facilities in the neighbourhood of the CariSal facility. This should include emissions in the form of hydrogen chloride gas, "brine spray" and such similar substances.

ESCL welcomes the opportunity to participate in this activity and remain available for future discussions on matters of mutual interest. We do however apologise for this tardy response, but this was unavoidable due to the short time period that was available to us.

Sincerely yours,

M. D. Amos

Mario Amos.
(Head-Environment, Health and Safety)

NATIONAL ENERGY CORPORATION
OF TRINIDAD AND TOBAGO LIMITED
Cor. Rivulet and Factory Roads, Brechin Castle, Couva,
Republic of Trinidad and Tobago, W.I.
P.O. Box 1127, Port of Spain, Trinidad West Indies
Tel: (868) 636-8471/1138/1156 Fax: (868) 636-2905

July 25, 2007

Mr. Roger Moore
General Manager
CariSal Limited
Building K2
Demerara Drive
Point Lisas Industrial Estate
Couva

Dear Sir,

RE: Reference No. CEC1743/2006- Application for a Certificate of Environmental Clearance (CEC) by CariSal Limited of Trinidad and Tobago for the Establishment of a Calcium Chloride Plant, Point Lisas.

Reference is made to your letter dated July 18th 2007, inviting comments on the Draft Terms of Reference for the proposal by CariSal Limited to construct a chlor-alkali plant and associated facilities at Point Lisas. In this regard, please see attached comments provided on the captioned subject.

Yours faithfully,

FOR: THE NATIONAL ENERGY CORPORATION.
OF TRINIDAD & TOBAGO LIMITED

Reeza Mohammed Ph.D.
Environmental Projects Co-ordinator

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26 JUL 2007

DIRECTORS: K. Awong (Chairman), B. Barnes, M. Jones, K.S. Julien T.C. (Professor Emeritus), L. Mayers, E. Mc Leod

Comments of Draft Terms of Reference for the Environmental Impact Assessment in Respect of: CEC 1743/2006 by CariSAL Trinidad Ltd for a Chlor-Alkali Plant and Associated Infrastructure at Point Lisas.

Section 2.2 Description of the Project

- Site plans should show daily traffic routes, car parks
- A description of decommissioning activities is required.
- Discussion on measures to ensure the integrity of pipelines responsible for the transport of caustic soda, brine and carbon dioxide.
- Capacity and design parameters for waste treatment facilities.
- A description on the location of accommodation facilities of the workforce during the construction and operational phases of the project should be included

Section 2.3 Physical Environment

- Groundwater quality and quantity should be included
- Physical and chemical characteristics of soils in study area should be included

Section 2.3 Biological Environment

- A description of sensitive areas and habitats should be included
- Species of scientific, rare and endangered species should be included

Section 2.3 Aquatic Environment

- Additional water quality parameters such as TSS,COD ,Chlorophyll a, nitrates, faecal coliforms heavy metals, pesticides and hydrocarbons must be included

Section 2.3 Socio-economic Environment

- Information on housing, education, religion and income of residents in the nearby areas should be included.
- Description of public health and safety
- Customs, aspirations and attitudes as well as an indication of the acceptability of the proposed project to users of the area, government stakeholders and environmental NGOs

- Description of baseline traffic conditions

Section 2.5 Determination of Environmental Impacts

- Potential impacts to ground water should be described
- Potential impacts from the release of odours
- Impacts regarding occupational health and safety issues should be addressed especially with respect to hazardous substances such as chlorine and caustic soda.
- Impact of project on the availability of potable water supplies in the study area.

Section 2.6 Analysis of Alternatives to project

- Alternative disposal options for waste materials should be considered

THE NATIONAL GAS COMPANY OF TRINIDAD AND TOBAGO LIMITED
Orinoco Drive,
Point Lisas Industrial Estate, Point Lisas
P.O. Box 1127, Port of Spain.
Tel: (868) 636-4662, 4680
Fax: (868) 679-2384

FLK/na

2007 July 27

Mr. Roger Moore
General Manager
CariSal Limited
3 Pelham Street
PORT OF SPAIN

Fax No. 679-1781

Dear Mr. Moore

Re: Comments on Draft Terms of Reference for EIA in Respect of CEC Application for the Establishment of Calcium Chloride Plant (CEC1743/2006)

Your correspondence of the 18th instant refers.

We wish to suggest that consideration should be given to Life Cycle Assessment and decommissioning.

Thank you.

Yours faithfully
For: **The National Gas Company of Trinidad and Tobago Limited**

FRANK LOOK KIN
President

DIRECTORS: K. Awong (Chairman), Dr. C. Bennett., E. Mc. Leod, C.. L. Mitchell, C. Pilgrim-Bristol, L. Ramyad, D. Small

PHOENIX PARK
GAS PROCESSORS LIMITED

Rio Grande Drive,
Point Lisas Industrial Estate,
P.O. Box 225, Port of Spain,
Trinidad, W.I.
Tel: 868.636.1522
868.636.4540
Fax: 868.636.6810

Stephen Harris
Manager, Safety, Environment & Security

July 31st, 2007

Mr. Roger Moore
General Manager
Carisal Limited
3 Pelham Street
Port of Spain

Dear Roger,

I refer to your letter dated July 18th 2007 and wish to respond as follows:

The following summarizes my view on the requirements of the TOR for CariSal's EIA process:

- Section 2.2, Pg 9; "An identification and description of all hazardous and non hazardous substances to be stored....." CariSal should consider this to mean "Cradle to Grave" responsibility of all identified hazardous materials. CariSal should also hint towards periodic inspections of the contractor dealing with the hazardous waste to ensure that the disposal facilities are compliant with world standards.

- Section 2.2, Pg 9; "An identification of the source, quantity and composition of all sources of potential liquid wastes...." This is potentially a dangerous question to answer, since the source and quantity of the waste stream will be known by material balancing; however there is no way of **accurately** determining the composition of the blowdown streams and hence the special risks that may or may not apply. This will require an intimate knowledge of the treatment philosophy for the boilers and cooling tower systems, chemical injection rates etc. Although it is most certainly a valid question, there is no way to know beyond certainty of the composition of the stream and hence all questioning relating to this issue can be viewed as not relevant.

DIRECTORS: K. Awong (Chairman), F. Look Kin, R. Nassar, B. Neylon, M.A. Pearce, C. Pilgrim Bristol, D. Sankar

- Section 2.3.1, Pg 11; CariSal should identify sensitive areas and the impact of the proposed plant operations i.e flora and fauna, especially with respect to Swamps etc.

- Section 2.3.1,Pg 11; " Aquatic Environment" The baseline studies to be performed at nearby watercourses for a twelve month period is unjustified. Why should the baseline study last for a one year period? What if the plant is commissioned during the one year period, can this sampling still be considered a "Baseline Study"? Not withstanding the above, COD (i.e chemical oxygen demand) should also be one of the studied baseline parameters.

- Section 2.4 : CariSal should clarify the role and requirements from the Town and Country Planning Division with respect to the applicability of a Completion Certificate to an industrial establishment.

- Section 2.4 : Should also include CariSal's obligation to the TT OSH Act.
- Section 2.5.1 Pg 16; " A suitable and sufficient assessment of the risk..." CariSal should conduct quantitative risk assessments to determine the maximum tolerable risk for individuals working on the plant as well as the risk that the fence line community and neighbors (Especially PPGPL) are exposed to during the operations of the plant.

Yours faithfully,

Stephen Harris

resin converters limited

69-72 Frederick Settlement, Industrial Estate, Caroni, Trinidad, West Indies.
P.O. Bag 1070 Valsayn. Trinidad, West Indies. (Mailing Address)
Telephones (868) 645-0235, Fax: (868) 663-6574
E-mail: resincon@~~tstt.net~~mail.tt

July 25th 2007

Attn: Roger Moore
General Manager
Carisal Limited
#3 Pelham Street,
Port of Spain, Trinidad W.I.

Dear Sir,

Re: Terms of Reference for Environment Impact Assessment in respect to the Carisal Project

I have read the "Draft" terms of reference for Environment Impact Assessment in respect to the Carisal Project at Pt. Lisas. This is a very thorough assessment along the lines we underwent in 1989 for the Chlorine Project for Quesnel – Scott Ltd. One of the big improvements to your process is the omission of liquefied chlorine. This was one of the biggest hurdles we had to address.

The terms of reference of this assessment really covers an in-depth analysis of your process. You are using the latest state of art membrane cell process which is highly accepted worldwide. I see nothing in the document that sent up any red flags for your proposed project.

This is one of the projects that are very right for our country. It is a clean process, little or no environmental impact and great export potential.

Regards,

Christian Quesnel
MANAGING DIRECTOR

TRINIDAD & TOBAGO
WATER & SEWERAGE AUTHORITY
HEAD OFFICE: VALSAYN, ST. JOSEPH, TRINIDAD W.I.

Cable Address: WASA
Code: Bentley's
Phone: 662-2302-7
Fax No.: 663-9117

YOUR REF.:
OUR REF.:

July 27th, 2007

General Manager
CariSal Limited
#3 Pelham Street
PORT OF SPAIN

Dear Mr. Roger Moore

Re: CEC1743/2006- Application for a Certificate of Environmental Clearance (CEC) by CariSal Limited of Trinidad and Tobago for the establishment of a Calcium Chloride Plant, Point Lisas.

Your correspondence dated July 18th 2007 on the above caption refers. The Water and Sewerage Authority is extremely satisfied with both the scope and depth of the Draft TOR. However, the Authority has attached the following comments for your attention, as requested:

BACKGROUND INFORMATION

The Draft TOR made reference to the total volume of water to be inputted into the CariSal operation as 295.2 m^3/hr, that is, 284 m^3/hr from DESALCOTT, 6.1m^3/hr from WASA and 4.6m^3/hr from rainwater. However, these values do not total to the aforementioned figure of 295.2 m^3/hr but 294.7m^3/hr. The Authority is suggesting that the calculation be revised so that the proposed volume of water needed for the project will be fully understood.

PHYSICAL ENVIRONMENT

Climate, Air Quality and Noise

The Air Quality Data should not only include the present air quality but any historical air quality information for the study area to serve as a baseline and provide a more thorough understanding of the air quality for the area.

SOCIO-ECONOMIC ENVIRONMENT

Within this section the Industrial Environment should be addressed since this will give the decision makers an idea of the Industrial tenants within the study as well as future developments that may affect or interact with the proposed project.

ASSESSMENT OF RISK

The Risk Assessment should be carried out to assess and quantify the cumulative effects for the proposed activity. Although an activity may be 'low risk', when combined with other activities in the area the risk may increase significantly.

Should you require any further information or assistance, please do not hesitate to contact our Assistant Manager Environment and Regulatory Compliance, Mr. Roger Karim at 662-2302 ext 2033/2005 or email rkarim@wasa.gov.tt.

Yours faithfully,

For and on behalf of Water and Sewerage Authority

.....

ROGER KARIM
MANAGER (Ag.)
ENVIRONMENTAL AND REGULATORY COMPLIANCE

July 30, 2007

Mr. Roger Moore,
General Manger
CariSal Trinidad Ltd.
Building K2,
Damerara Drive
Point Lisas Industrial Estate

Dear Mr. Moore,

RE: COMMENTS TO APPLICATION FOR ENVIRONMENTAL CLEARANCE REF # CEC1743/2006

Further to our letter of July 27th 2007, please find attached our final comments to your proposal.

We trust that we are still in good time, and if you have any need for further information, please contact Mr. Kawal Maraj, our HESQ Manager.

Yours Sincerely,
YARA TRINIDAD LTD.

Peter Dowding
Business Development Manager

Yara Trinidad Ltd.
Plant Location
Southern Main Road
Savonetta
Trinidad
West Indies

Postal Address:
P.O. Box 952,
Port of Spain,
Trinidad,
West Indies

Phone:
1 (868) 636-2020-39

Telefax:
1 (868) 636-2073
1 (868) 636-0834
1 (868) 636-0969

Cable:
HAGRI

COMMENTS TO THE APPLICATION FOR ENVIRONMENTAL CLEARANCE REF # CEC1743/2006

CARISAL TRINIDAD LTD.
JULY 27TH 2007

The following are our comments regarding the Application by CariSal T'dad Ltd in view of the establishment of a Calcium Chloride Plant at Point Lisas.

1. Section 1.2 pg 5: Evaluation of possible changes to ambient air quality from plant emissions, impacts on the community and neighbouring areas as a result of emissions from point and non-point sources, i.e Chlorine proposed as a temporary product.

   Comments:
   Need toxicity modelling regarding Off-Site risks or societal risks, in addition to hazards from Chlorine release, potentials as a chemical. A "Chlorine" production facility upwind of a high employee density plant needs to be scrutinized.
   Health effects on people and Fauna. Yara will need to know the effects of the levels of chlorine and other chemicals on Catalyst Poisoning, Corrosion of different metals and clogging of filtration, etc.

2. Section 2.1.2 Pg 7: Use of GIS

   Comments:
   Greenfield technology of this operation in Trinidad and the need to assess the sustainability of such operations. We should also reinforce the roadways before construction begins, regarding construction activities and dust, etc.

   Addition of Point:
   Emergency Access & Egress Routes (to be inserted after Vegetation Types)
   Quantitative risk assessments
   Monitoring or underground installation.

3. Section 2.2 pg 9 Description of the Project:

   Comments:
   A separate listing of toxic chemicals as distinguished from the generic "hazardous" category.
   Full details as per requirements of the registration re: liquid effluences water pollution rules 2000

   Section 2.2 pg 9 Description of all other associated works and infrastructure:

   Comments:
   Maintenance, turnaround, revamps, demolition, mothballing, preparation of Plat for maintenance, emergency operations, pre-commissioning, commissioning. (to be inserted at end of first point)

COMMENTS TO THE APPLICATION FOR ENVIRONMENTAL CLEARANCE REF # CEC1743/2006

CARISAL TRINIDAD LTD.

JULY 27TH 2007

4. Section 2.5 pg 15 Determination of the Potential Impacts of the Proposed Project

   Insert – Impact of wind direction changes.

5. Section 2.5 pg 17 Risk Assessment should be carried out to assess and quantify the risk of occurrence of significant hazards inclusive of, but not limited to

   Comments:
   All types of emergencies including hurricanes, flood, earthquakes, the effects of tides e.g "Spring Tides" are to be assessed.

6. Section 2.8 pg 20 Development of a Monitoring Plan

   Comments:
   ISO 14000 Process, OSHAS 18001

environmental impacts through mitigation, implementation of a monitoring plan to ensure the mitigation measures are effective and the assessment of hazards and risks associated with the proposed activity. Particular emphasis should be placed on evaluating possible changes to ambient air quality from plant emissions, impacts on the community and neighbouring areas as a result of emissions from point and non-point sources (i.e. the chlorine proposed as a temporary product in the process). The effects of runoff and effluent from the project site, which may result from either developmental or operational phases on water resources, should also be investigated.

need toxicity modelling regarding Offsite risks or Societal Risks in addition to Hazards from Chlorine release potential as a Chemical

1.3 Legal Framework

The CEC Rules, 2001 were made under section 26(h) of the Environmental Management (EM) Act, 2000 and came into effect on July 7, 2001. The CEC (Designated Activities) Order, 2001 outlines a list of activities that require a CEC from the EMA before such activities can commence. The establishment of the proposed chlor-alkali plant and associated infrastructure is consistent with the aforementioned Designated Activities (See Introduction) of the CEC Order, 2001.

The CEC Rules describe the process to apply for and obtain a CEC. Rule 5(1) of the CEC Rules describes the process for preparation of the TOR for an EIA, while Rule 10 outlines the standards of preparation of the EIA. This environmental assessment is requested in accordance with the relevant sections and rules of the EM Act and CEC Rules, respectively.

A "Chlorine" production facility located in a high "people" density plant needs to be scrutinized

In order to be environmentally acceptable, the establishment of the facility must be in compliance with international standards or guidelines where the pertinent local standards or guidelines have not been formalized. Local environmental standards or guidelines, which are applicable to CEC application **CEC1743/2006**, include, but not be limited to, the following:

- TTS 547:1998 (Specification for the Effluent from Industrial Processes Discharged into the Environment)
- TTS 417: 1993 (Specification for liquid Effluent from Domestic Wastewater Treatment Plants into the Environment)
- Water Pollution Rules, 2001 as amended in the Water Pollution (Amendment) Rules 2006
- Noise Pollution Control Rules, 2001
- Draft Air Pollution Rules, 2005
- National Environmental Policy
- Occupation Health and Safety Act (2006 as amended)

Health Risk Effects on Fauna

Yara will need to know the levels of Chlorine & other chemicals on Catalyst Poisoning, Corrosion of different metallurgy and clogging of filtration

2.1.2 Use of GIS

The scale and nature of this intended project and the study area requires the use of GIS to represent spatial data wherever practicable. Submitted data should be presented in a working GIS project readily compatible with ArcView version 3.2 and organised into discrete themes (i.e. shape files – point, raster and vector data). Data themes should illustrate, but not necessarily be limited to, the following features/attributes:

"Greenfield technology" of our operation in T'dad – Sustainability of Business
We should reinforce the roadways before construction begins regarding Construction Activities & Dust etc

- Site boundaries
- Roads (all classes) –
- Built development in the wider study area (e.g. residential, institutions – schools, hospitals etc.)
- Water resources – rivers/streams, standing water bodies, aquifers/groundwater resources, municipal wells as applicable.
- Civil infrastructure (e.g. pipelines, etc)
- Pre- and post-development topography (contour lines at appropriate intervals, preferably in metres)
- Sampling points for baseline data
- Proposed monitoring stations/points
- Proposed general drainage of the area with effluent points
- Proposed buffer zones
- Site layout
- Corridors for utilities, pipelines, conveyor/delivery systems
- Soil types
- Vegetation types
- Emergency Access & Egress routes, Quantitative Risk Assessment

For features in themes to which particular emphasis is to be placed, consideration should be given to linking photographs wherever they are available. Themes should be clearly labelled/annotated as necessitates.

Monitoring of Underground Installations.

Map units and distance should be set in metres and kilometres respectively, while the UTM projection should be utilised. GIS, as far as practicable, should be utilised to illustrate the current features of the study area as well as the planned development for the completed project.

2.2 Description of the Project

The description of the project will include a justification statement and detailed descriptions of the project's phases and activities. A site plan at a scale of 1:5000 (or other appropriate level) should be provided to indicate the general layout of the proposed facilities as well as its relationship with the study area. Where necessary, appropriate plans should be included at relevant scales to facilitate easy comprehension of location, design, construction or operational processes.

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Educational Efforts

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MINISTRY OF EDUCATION

DIRECTOR OF SCHOOL SUPERVISION
18 ABERCROMBY STREET
PORT OF SPAIN
PHONE: 623 – 0661 FAX: 624 - 6412

October 19, 2007

Ms. Lenore Joseph
Communications Consultant
Relationship and Protocol Services Ltd.
10 Bengal Street
St. James.

Dear Ms. Joseph,

Re: Career Guidance Project

Your letter of October 3, 2007 refers.

Approval has been given to the Mr. Roger Moore, General Manager, CariSal Ltd. to introduce his organization and its career guidance project to students of science / chemistry classes in the south / central area.

It must be noted that participation in this activity is at the discretion of the principal and that they must be approached well in advance in order to minimize disruption of normal contact time for students.

Yours faithfully,

Benedict Paul SPS
.....
for Roland R. Maharaj
Director of School Supervision
MINISTRY OF EDUCATION

DIRECTOR OF SCHOOL
SUPERVISION

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CariSal Unlimited
Proposal for Lunch and Learn Sessions

Overview

As part of the Public Engagement Programme for CariSal Unlimited, it is proposed that the Company embark on a series of informal 'talk' sessions initially with primary and secondary school students in fence line and other communities. These sessions are to be targeted particularly to the Science/ Chemistry classes where students may already be contemplating careers in the upstream or downstream of the Energy Sector in Trinidad and Tobago.

Objectives:

- To create awareness and excitement about science and engineering careers, especially in the calcium chloride industry and related industries.
- To introduce CariSal as a new neighbour and as an example of clean production and corporate social and environmental stewardship among the youth who are most likely to spread the word to their peers and other contacts.
- To provide a rewarding experience to the target group so that excitement is created about being selected to attend a CariSal learning session.
- To build relationships with members of the host community/ies by initially providing details of the project in Trinidad and Tobago, its process, and the likely benefits to be derived by the country in the long term.
- To carry out CariSal's commitment to good corporate citizenship and demonstrate its interest in the positive development of local youth.
- To demonstrate that business can be good for profits, the environment and community education/development. We add value to the communities that host our facilities by building capacity and investing in people – especially youth.

Strategy

Titled "Lunch and Learn with CariSal Unlimited", the sessions will take place between 11.30 am - 1pm at a selected conference facility. Eight students and two teachers from five schools will be extended an invitation to attend the informative presentation hosted by CariSal. An exciting presentation that includes a hands-on exercise is recommended to spark interest and hold the attention of the audience. (A brief will be presented to the Lunch and Learn project contractor/s for development of the presentation).

All sessions will be taped for development of future educational material, and media coverage will be invited to ensure publicity for the project.

DRAFT

Implementation

Contact will initially be made with school principals to determine their interest and the most suitable time for students during the term. It is anticipated that they may request that this be held either mid-term or after end of term examinations prior to the vacation period.

Formal letters of invitation on CariSal letterhead will then be dispatched to school principals confirming arrangements for the session.

Proposed Location

Cara Suites in La Romaine is proposed as the venue for the session, as schools to be targeted will be in the communities closest to CariSal.

Summary

This is one of several initiatives which will form part of the overall public engagement programme for CariSal Unlimited. Its success could spur other activities and more opportunities to develop community partnership and education initiatives such as a scholarship programme for science/chemistry students.

DRAFT

APPENDIX E
SELECTED DATA AND UNPUBLISHED DOCUMENTS

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Town and Country Planning Division – Status of Land

HUMAN IMPACTS

CariSal Limited Emergency Response Plan
Chlorine Institute Certificate
Risk Assessment Modelling Protocol
Traffic Count Data Report for Southern Main Road Point Lisas, August 2007
Traffic Count Data Report For Southern Main Road Point Lisas, September 2007
Traffic Count Data Report for Pacific Avenue Point Lisas, August 2007
Traffic Modelling Output

FLORA AND FAUNA

Biological Reconnaissance Survey Report
Flora and Fauna Species Identified in the Immediate Project Area
CariSal Point Lisas Development Plot of Wetland Boundary Report

WATER QUALITY

Baseline Ground Water Quality Monitoring Report, August 28, 2007
Baseline Ground Water Quality Monitoring Report, November 13, 2007
Baseline Surface Water Quality Monitoring Report, July 4, 2007
Baseline Surface Water Quality Monitoring Report December 6, 2007

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CariSal Final Geotechnical Report

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Environmental Noise Monitoring at Carisal Limited, August 2007

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Cumulative

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Figure 29. Air Quality Modelling for PM 10. 24-Hour Maximum Concentration, CariSal Only. - CONSTRUCTION

Figure 30. Air Quality Modelling, Annual Average PM 10, CariSal Only. - CONSTRUCTION

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OTHER

Proposed CariSal Site General Arrangement

Mixing Height Data

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Town and Country Planning Division – Status of Land

TOWN AND COUNTRY PLANNING DIVISION

MINISTRY OF PLANNING AND DEVELOPMENT
Eric Williams Finance Building, Independence Square, Port-of-Spain

Phone: **627-9700**

REF: **T5M: 6/5/4**

Date: **2007** · 07 · 05

Carisal Limited
c/o Roger Moore
Building #2 Demerara Drive
Point Lisas Industrial Estate
Point Lisas
Couva

Dear Sir/Madam,

Re: Request re status of lands located at Road Reserve Off southern Main Road, Point Lisas, Couva

Reference is made to your correspondence dated 20th June, 2007 and submitted on 05th July, 2007 on the above-captioned matter, concerning the use of a parcel of land of unspecified area, for industrial purposes (Calcium Chloride Facility).

Please be advised that the site has been visited and the matter investigated. The site, which you have identified, is located in an area allocated for industrial purposes.

Yours faithfully,

.....
Director (Acting),
Town & Country Planning Division

RECEIVED
06 JUL 2007

TOWN AND COUNTRY PLANNING DIVISION
PORT-OF-SPAIN

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Human Impacts

Document
CariSal Limited Emergency Response Plan
Chlorine Institute Certificate
Risk Assessment Modelling Protocol
Traffic Count Data Report for Southern Main Road Point Lisas, August 2007
Traffic Count Data Report For Southern Main Road Point Lisas, September 2007
Traffic Count Data Report for Pacific Avenue Point Lisas, August 2007
Traffic Modelling Output

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CARISAL LIMITED

EMERGENCY RESPONSE PLAN

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1. INTRODUCTION
2. NOTIFICATION AND ACTIVATION
3. ROLES AND RESPONSIBILITIES
4. CONTACT DIRECTORY
5. LINKED PLANS
6. TYPES OF EMERGENCIES
7. RESOURCES
8. PLAN MAINTENANCE
9. OFF HOURS EMERGENCY RESPONSE
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CARISAL LIMITED

EMERGENCY RESPONSE PLAN

1 INTRODUCTION

1.1 Purpose

This Plan describes the response organization and procedures required to deal with emergency situations.

The primary objectives of the plan are to:

- Locate and define the emergency within or outside the Plant
- Eliminate the threat or minimize its effect on the people in the Plant and those of the adjacent (fence-line) communities and on the Plant assets.
- Notify critical respondents first and then communicate, as necessary, with adjacent communities on the nature of the emergency.
- Restore normalcy as quickly and as efficiently as possible.

1.2 Scope

The Emergency Response Plan (ERP) covers all activities and operations under the control of the Emergency Response Organization. Specific responsibilities of each member of the team are identified in this document.

This plan describes the steps to be taken and the procedures to be followed in the event of an emergency in the Plant or an emergency outside of the Plant that could impact the safety of the employees, fence-line communities and the integrity of the Plant assets.

CariSal believes in prevention first and foremost, by applying best practices and committing well-trained in-house resources to deal with the emergency in its initial stages. However, in the event of an unforeseen natural disaster or a catastrophic incident, it might well be necessary to engage the assistance of the local Fire Services, Police, NEMA and TTEMAS.

1.3 Definitions

Emergency: An event that seriously threatens the immediate and future safety of people, the environment, property or business.

Incident: A situation that has the potential to escalate into an emergency should preparatory systems fail to respond adequately.

Response Management Team (RMT): The group of employees that provide strategic support to the Company's Tactical Response Team (TRT). This team is lead by CariSal's General Manager in the capacity of Incident Commander (IC). The team will comprise other line managers as follows: the Human Resources Manager, The Finance and Administrative Manager, the Production Manager and the Maintenance Manager. Their respective roles in the RMT are described later in this document.

On-site Incident Controller (OIC): This is the person who is responsible for leading the charge in dealing with the incident in the 'field'. He heads the Tactical Response Team (TRT). On normal work days, this role is the responsibility of the Manager of HSSE. During off hours, the responsibility rests with the Shift Supervisor.

The TRT will comprise shift operators as well as maintenance supervisors and technicians.

2 NOTIFICATION AND ACTIVATION (COMMUNICATION AND COORDINATION)

2.1 Early Warning / Alarm System

The plant will be outfitted with an electrical alarm system (siren), which will be audible for a radius of 2.5 km. It will be actuated from the Control Room. The supply to the alarm will be tied to the emergency bus or UPS system, so that it remains active even during a T&TEC supply failure.

The alarm protocol is as follows:

Small Fire or Incident – No siren

Major Fire or Emergency – A wailing siren for three minutes.

All Clear – A straight-run siren for three minutes.

System Test – A straight-run siren for 10 seconds. The system will be tested every Tuesday at midday.

In the event of an Emergency – a major fire or catastrophic event – that necessitates the sounding of the Plant alarm, all non-essential staff and contractors will be required to evacuate the site and head to a defined Muster Point - the Administration Building Car Park. There they will await instructions that will be relayed to them by the IC through the Human Resources Manager.

2.2 Initial Notification

The key to minimizing the impact of an emergency is the early detection, control and reporting of the incident. Once an incident has occurred and has been identified, it will be brought to the attention of that individual's Supervisor who will then notify the HSSE Manager, who will in turn, notify the General Manager. This notification protocol is essential and will include the general details of the situation including the five W's (Who, What, Where, When, Why). Until the HSSE Manager has taken charge, the Supervisor on site will be responsible for the management of the incident in the role of On-site Controller.

If personnel injury is involved, the nearest medical station will be activated. All recommendations of the Medical Professional on-site will be followed, unless the HSSE Manager determines that this would put more individuals at risk.

2.3 Activation of the Response Team

The General Manager will notify other members of the RMT, as needed, depending on the circumstances of the incident. He will also indicate where each member of the team shall report and the method of communication that will be employed for the duration of the emergency. In all cases of personnel injury or death, the General Manager, HSSE Manager and Human Resource Manager (HR) will be included in the RMT. If any of the above is unavailable, then pre-nominated substitutes will be included.

2.4 Notification to Venture Management

The General Manager will, for all incidents, notify the Venture Management team as soon as possible. This notification will provide all of the information that is available at that time.

3 ROLES AND RESPONSIBILITIES

3.1 The General Manager (IC)

Is the representative that has overall responsibility for managing the Emergency. He will insure that appropriate plans are in place and resources are adequately trained and accessible to confront any Emergency. All notifications and communications with the public and the Media will be through the IC or his/her designee.

The IC will establish a Response Management Team (RMT). This team will be structured to manage all emergencies and will consist of whoever he deems necessary to manage the situation. Once appointed to the RMT, the responsibilities of the RMT will become each member's primary duty. The RMT will be continually assessed on its size and make-up and capability to achieve the objectives of the plan.

3.2 HSSE Manager (OIC)

The HSSE Manager is the on-site incident commander that directs the response to the emergency within the Plant area. Outside normal working hours, this role is played by the Shift Supervisor. Once an emergency has been identified, the OIC, will go immediately to the Emergency Control Centre – the Control Room - if not already there. From that location, he will assess the situation carefully and direct his charges to safely deal with it or arrange with the IC for external support for the emergency.

He will ensure that all CariSal's physical safety resources are available and in good working condition at all times, and will also be responsible for ensuring that essential plant personnel are adequately trained to deal with any emergency on the plant. Overall responsibility on-site for the operational response of resources will be his, including the direction of all assets directly under his control (e.g. contractor vehicles, special equipment and personnel, SOS evacuation support).

He will ensure that all personnel have been made aware of their roles and responsibilities with regard to the emergency action procedure.

Keep, or direct to be kept, a log documenting all activities that occurred during the emergency. Keep the IC and other RMT members (as required) notified of the situation, and be responsible for making notifications to the IC when required.

Ensure that a mechanism is in place for developing, reviewing and approving emergency action procedures. The HSSE Manager will audit the standing preparations and schedule drills to identify weak links in the system and provide training for potential members of the RMT.

The HSSE Manager will conduct drills to evaluate and provide information to improve this plan.

During an incident he will report directly to the General Manager (Incident Commander), and provide advice and assistance to the RMT.

The HSSE Manager will implement a training program that addresses the requirements of the site emergency response plan, including the training of fire fighting personnel.

He will be responsible for keeping an inventory of all hazardous materials brought onto site. The Procurement Department will submit Material Safety Data Sheets (MSDS') to the HSSE Manager for his review prior to any hazardous substance being brought onto the site.

3.3 Human Resource Manager (HR)

The Human Resource Manager will ensure clear efficient lines of communication are established between the members of the RMT. He/She will work with the IC and the OIC to identify the key issues, objectives and strategies for the response when emergency support is needed from external sources. Some of the key issues are identified below:

- Any implications resulting from fire, explosion, toxicity.
- Overall risk to the public, local businesses, the facility or the environment.
- Risk to CariSal, such as adverse publicity, authority controls, license to operate and any legal considerations.

Assist the IC with communications and gathering and transmitting information.

Keep up-to-date next of kin documentation and all employment records of current employees.

Arrange for the notification of family members when required.

Establish the location of all personnel, and the names and number of injured or missing personnel.

Provide administrative support to the RMT as required, including situation reports.

3.4 Production Manager

The Production Manager will perform the role of Liaison Officer and will be responsible for assisting and/or co-opting agencies involved in the response. This includes representatives from Government, Law Enforcement, Mutual Aid, Environmental, and other organizations external to CariSal, which could be involved in the response. He will obtain briefings from IC and be the point of contact for dealing with these external Representatives. He will assist the HR Manager in preparing "Information Release" forms or Communiqués and ensure that the authorities are regularly updated on the status and progress of response operations.

He will keep the HR Manager informed of any perceived or stated concerns of the external agencies.

3.5 Maintenance Manager

The Maintenance Manager will assume the role of Planner, and will primarily be responsible for predicting the probable course of the incident and planning for strategic and tactical responses to the emergency. Utilizing strategic objectives determined by the IC, the Maintenance Manager will utilize all information gathered on the incident to prepare an Incident Action Plan. He will also be responsible for providing all environmental activity and support for response operations; for tracking incident resources and their status; for documenting all response activities; and for planning for the demobilization of the RMT.

Additionally, he will re-assign initial response personnel into positions as deemed appropriate; oversee the implementation of the Incident Action Plan and assemble information on alternative strategies. He will identify the need for specialized resources and ensure that these resources have responded to the call for help.

4 CONTACT DIRECTORY

See Appendix 1

5 LINKED PLANS

5.1 External Medical Support

CariSal will establish contractual arrangements with Bristow for the Medevac of individuals by air to facilities external to the plant if need be. Requests for Bristow support will be made directly by the General Manager upon consultation with the HSSE Manager, the Human Resource Manager and Medical Professional (on contract with CariSal) at the incident site, who is working with the injured personnel that may require medevac.

More usually, the injured or ill will be taken to either of these institutions by approved Ambulance service.

Medical facilities at Petrotrin, (Augustus Long), Port of Spain (General Hospital), San Fernando (General Hospital) or the Eric Williams Medical Complex, will be used when needed, as well as approved private institutions.

6 TYPES OF EMERGENCIES

Below is a listing of the likely types of emergencies that could be experienced by CariSal. This list will be used as the basis for designing practice drills:

- Natural gas leak
- Fire and explosion
- Toxic liquid spill from pipeline or tank failure.
- Toxic gas emission from pipeline rupture
- On the job injuries or illness
- Civil disorder
- Geophysical – earthquakes, flood, hurricanes and other natural disasters

6.1 NATURAL GAS LEAK

The probability of failure in gas transmission lines is minimal. However, if failure does occur, any release may readily disperse or be ignited by a source on site. The result could be a major **FIRE AND EXPLOSION** hazard. **SMALL** plant fires may be handled by the employee who discovers the fire, if practical, by first isolating the flow of gas to the fire and then extinguishing the flames.

Actions to be taken by personnel finding a leak:

1) Eliminate all possible sources of ignition; shutdown hot work, stop vehicles etc.
2) If practical, try to control and isolate the leak.
3) If the leak cannot be <u>readily</u> and <u>safely</u> controlled, activate the Emergency Shutdown System (ESD), evacuate the area and inform the control room via radio or gaitronics.

Subsequent actions:

1) Control room personnel will actuate the plant siren to alert all personnel and neighboring companies.
2) Isolate the source of the leak and carry out repairs before restarting plant operations.

At least two people shall be present when breathing apparatus is required to isolate a leak (gas or liquid). Only one person will try to isolate the leak, with the other person standing by to help as needed.

CAUTION: ONLY PERSONS IN EXCELLENT MEDICAL CONDITION WILL BE ALLOWED TO USE BREATHING APPARATUS- PREFERABLY SCBA'S

Whenever there is the threat of an emergency, the On-site Incident Commander (OIC) will request that the **Trinidad and Tobago Emergency Mutual Aid Scheme** (TTEMAS) be immediately notified via telephone 800-4GAS (800-4427

6.2 FIRE AND EXPLOSION

Although the probability of fire and explosion on this Plant is low, it could still happen as mentioned earlier in the case of a natural gas pipeline leak or a rupture of the hydrogen gas header in the Chlor-Alkali facility that contacts an ignition source

Actions to be taken following a fire and explosion:

1) If the leak cannot be readily and safely controlled, activate the Emergency Shutdown System (ESD), evacuate the area and inform the control room via radio or gaitronics.
2) Control room personnel will actuate the plant siren to alert all personnel and neighboring companies. All work must be immediately stopped.

Subsequent actions:

1) The emergency tactical team will attempt to put out the fire while the RMT's strategic team mobilizes to take control of the situation and do whatever is deemed necessary to quickly bring the situation under control.
2) After the event, the damage will be assessed and all resources necessary to effect repairs identified and procured.

6.3 TOXIC LIQUID LINE OR TANK FAILURE

Toxic liquids in this facility include Hydrochloric acid, Caustic Soda and Bleach, all of which will pose an environmental, health or serious injury threat should there be an uncontrolled release of these liquids, as will occur in a tank or pipeline rupture. Reference will be made to the relevant MSDS for guidance in terms of the appropriate PPE and general handling of the liquid.

Actions to be taken following a fire and explosion:

1) If the leak occurs as a result of a tank rupture, the respective tank dyke will contain the full contents of the tank. Control room personnel will actuate the plant ESD and ensure that all plant personnel remain upwind of the resulting spill. 2) If the leak occurs as a result of a line failure, every attempt will be made to safely isolate the leak in order to control and minimize the spill. Control room personnel will actuate the Plant ESD and ensure that all Plant personnel remain upwind of the resulting spill.

Subsequent actions:

1) The emergency tactical team wearing the appropriate PPE will attempt to pump out the spilled liquid into suitable portable containers, while the RMT's strategic team mobilizes to take control of the situation and do all that is prescribed to manage the emergency and quickly bring the situation under control.
2) After the event, the damage will be assessed and all resources necessary to effect repairs

to the line identified and procured.

3) Soil remediation at the location of the spill will be a critical repair activity.

6.4 TOXIC GAS EMMISSION

Toxic gases in this facility will include Hydrogen, Hydrochloric Acid vapors, Caustic Soda vapors and Chlorine, all of which will pose an environmental, health or serious injury threat should there be an uncontrolled release of these gases as will occur in a pipeline rupture or failure of scrubbing operations.

Actions to be taken following a toxic gas emission:

1) If the emission occurs as a result of a line rupture, Control room personnel will actuate the Plant ESD , isolate the leak and ensure that all Plant personnel remain upwind of the resulting emission. Based on emission modeling studies, any such event will not compromise the fence-line communities because of the distance from the Plant of the likely points of failure, the operating pressure of the chlorine or hydrogen header and the volume of gas that will be emitted prior to the ESD.

2) If the emission occurs as a result of scrubber failure, Control room personnel will actuate the plant ESD and ensure that all Plant personnel remain upwind of the resulting spill. Fence-line communities that are down-wind (normal wind direction) of the emission will be notified and advised to stay indoors as added precaution, but emission studies suggest that they will not be threatened by any such occurrence because of distance from source.

3) If the wind direction is from the west, all Plant staff will be advised by Intercom, to stay indoors (Safe Rooms) and to ESD the air conditioning systems as a further precaution against toxic gas inhalation. Fence-line communities to the east of the Plant are too remote to be affected.

Subsequent actions:

1) The emergency tactical team wearing the appropriate PPE will confirm the source of the emission and the cause, while the RMT's strategic team mobilizes to take control of the situation and do all that is prescribed to manage the emergency and quickly bring the situation under control.
2) All resources necessary to effect repairs to the line or scrubber, as the case may, will be identified and procured.

6.5 ON-SITE INJURY OR ILLNESS:

Actions to be taken in the event of injury or illness:

1) If a worker is injured on the job or falls ill, the situation must be reported immediately to the Control Room from where the HSSE Manager, the HR Manager or the IC will be notified.
2) If possible, the patient will be stabilized using basic first-aid treatment by a competent person and after consultations with the Medical Practitioner on contract with CariSal and on call, the patient may be removed and transported to the nearest medical institution by road or air ambulance.

3) No attempt will be made to treat or move the patient if in the opinion of the HSSE Manager, others will be placed at risk in so doing.

Subsequent actions:

1) The RMT will ensure that all remaining workers on site are safe and accounted for.
2) The family and next of kin of the injured or ill will be immediately notified and provided with all the information about the injured or ill that is available at the time. No effort will be spared by the RMT in ensuring the wellbeing of the patient.
3) Operations will resume after all systems are restored to safe working order.

6.6 CIVIL DISORDER:

Actions to be taken in the event of civil disorder:

1) The IC will have sole responsibility for deciding whether a situation of civil disorder warrants shutting down the facility and sending non-essential staff home.
2) The local police will be immediately informed of the situation and additional contract security will be brought in to protect employees, their assets and the company's assets.
3) The Venture Manager will also be immediately informed of the situation in keeping with the RMT's reporting protocol.
4) Based on an assessment of the situation, provisions will be made to ensure the safety and comfort of the workers on the site should the decision be taken to maintain Plant operations and the workers cannot be relieved after a normal shift – the worse case scenario.

Subsequent actions:

1) All operations will be restored to normalcy if in the opinion of the IC, it is reasonably safe to do so.

6.7 GEOPHYSICAL PROBLEMS:

Appendices 2 and 3 cover modus operandi in the event of Earthquakes and Hurricanes,

6.8 BOMB THREATS:

Appendix 4 covers the what-to-do in the event of a bomb threat.

7 RESOURCES :

The Plant will be designed with a fire-water system of adequate capacity to fight a Plant fire for 4 continuous hours. It will consist of a ring, complete with strategically located fire hydrants with standard fittings and hoses of sufficient length to reach the furthest points on the Plant. An electric pump and diesel back-up will take suction from the raw water tank and the system pressure of 120 # will be maintained continuously by an electric jockey pump. Power to the jockey pump will be available off the emergency bus.

Additional equipment on the Plant include mobile dry powder extinguishers for fire situations that cannot tolerate water as well as wall-mounted dry powder fire extinguishers.

7.1 Fire Fighting Equipment

All offices will be equipped with fire extinguishers. All company vehicles will be equipped with dry powder fire extinguishers.

7.2 Spill Clean-up Equipment

Spillage cleanup equipment will be available as needed. The spill cleanup equipment shall include the following:

- Shovels
- Heavy duty plastic bags
- Absorbent spill pads/booms and saw dust
- Protective clothing

Mechanical excavators and dump trucks will also be available as needed.

7.3 Medical Equipment

First Aid kits will be located one in each building. These kits will contain all basic medical supplies appropriate for handling small cuts and abrasions and mild shock.

7.4 Aircraft Support

CariSal will have available emergency helicopter support arrangements made with Bristow for medevac support on an on call basis.

8 PLAN MAINTENANCE

8.1 Control of this Plan and Issuing Changes

A copy of the Plan will be issued to the individuals – members of the RMT (strategic and tactical) - and departments that will be required to play a significant role in the event of an emergency.

Changes will be issued by the HSSE Manager when this becomes necessary. These changes can take many different forms, from a complete reissue of the Plan to replacement of an Appendix.

8.2 Drills

8.2.1 The RMT

The RMT will conduct desk top drills periodically to ensure good coordination within the team.

Company drills will be held once a quarter. Prior to all company drills, fence-line communities will be notified using mobile loud speakers, between the hours of 5.00 pm and 6.00pm on two days that week.

8.2.2 Office Fire Drills

Office Fire drills will be carried out at the office location once a quarter until a satisfactory performance is obtained, thereafter they will be conducted once every six months.

8.2.3 Assembly Points

The Administration Building car park will be the official Muster Point for all non-essential staff. A sign to that effect will be placed there.

This muster provides a method for accounting for all employees during and after an emergency.

9.0 EMERGENCY OPERATIONS - OUTSIDE NORMAL WORKING HOURS (3:30 PM - 7:00 AM) WEEKENDS & PUBLIC HOLIDAYS

Outside normal working hours **(between 3:30 p.m. and 7:00 am)** the Shift Supervisor will assume the position of Incident Commander and ensure that appropriate action is taken to control the emergency. He will instruct security to call out the following:

- General Manager– Incident Commander
- Manager, Health, Safety, Environment and Security – On-site Incident Commander
- Human Resource Manager
- Finance Manager - Finance & Administration Officer
- Production Manager
- Maintenance Manager

Along with employees, according to the call out schedule, and if necessary , any assistance required from sources listed in Appendix 1.

10.0 DOCUMENTATION

A log will be kept of all activities of an emergency as directed by the RMT. The HSSE

Manager will select a team to perform a Root Cause Investigation of the emergency

ASAP after the conclusion of the emergency and will disseminate lessons learned to all staff in accordance with the company's policy on openness and transparency.

11.0 APPENDICES

11.1 Appendix 1

TELEPHONE NUMBERS

CariSal CONTACTS

General Manager
Manager Health, Safety, Security & Environment
Manager of Production
Manager of Logistics
Manager, Finance & Administration
Maintenance Manager
Human Resource Manager
Materials Supervisor

FIRE STATIONS		**990**
Headquarters Port of Spain		625-2671 - 5
Couva		636-2255
Caribbean Ispat		636-2211/5
PCS Nitrogen		636-2205 - 9
Methanol	TTMC	636-2906 - 9
	CMC	636-3153
Hydro Agri		636-2020

POLICE	**999**
Couva	636-2333
Chaguanas	665-5271
San Fernando	652-2564

HOSPITALS

Port of Spain General	623-2951
San Fernando General	652-3581 - 6
Couva District	636-2411
Surgi Med Clinic	652-4958
Victoria Nursing Home	652-3153/3677
Southern Specialist Centre	652-4535
Augustus Long Hospital	658-3211
Gulf View Medical	652-7102/6005
St. Clair Medical	628-8615
Medical Associates	662-2766
Community Hospital	622-1191/2
Auzonville Medical Centre	645-6437/4626

DEFENSE FORCE

Headquarters	634-4463
Air Wing	634-4267
Coast Guard	625-4935

ESTATE COMPANIES

YARA TRINIDAD	636-2020
PCS NITROGEN	636-2205 - 9
CARIBBEAN ISPAT LIMITED	636-2211
INDUSTRIAL GASES	636-2761
L. JOHN WILLIAMS	636-8214
METHANOL - TTMC	636-2906 - 9
- CMC	636-3153
NATIONAL GAS **(800-4GAS (4427)**	636-4606, 4662
PLIPDECO	636-2201
PLIPDECO PORT	636-2706 - 9
SECURITY	636-4023
ANSA MCAL.	636-5380
T & TEC	636-2525, 4871
UNIVERSAL FOODS	636-7965
ALLIED PETROLEUM	636-5832
POINT LISAS NITROGEN	636-3901

11.2 Appendix 2

EARTHQUAKES:

Earthquakes generally occur suddenly with no pre-warning.

The actual earth movement of an earthquake is seldom a direct cause of death or injury. However, this movement causes collapse of buildings and other structures. Most casualties result from, but are not limited to:

- Fallen power lines.
- Drastic human actions resulting from panic. (*This rarely happens*)
- Fire resulting from broken gas lines - the danger may be aggravated by lack of water due to broken mains.
- Sea waves generated by earthquakes.
- Toppling furniture, collapsing walls, splintering glass etc.

DURING AN EARTHQUAKE

Workers will be encouraged to:

1. Remain calm.
2. Think through the consequences of any action that you plan to take.
3. Try to reassure others.
4. If indoors, watch for falling objects. If in danger, get under a table or desk; in a corner away from windows; or in a strong doorway. Encourage others to follow your example.
5. If outdoors, seek open areas away from buildings or power lines.

AFTER AN EARTHQUAKE

1. Check for injuries.
2. Do not attempt to move seriously injured persons if they are not in immediate danger of further injury.
3. Check for fires.
4. Check for utility lines. (Live electric lines? Broken gas lines?)
5. Check for gas leaks.
6. Do not pay attention to, or spread rumors - they often do great harm following disasters.
7. Stay off the telephone, except to report an emergency.

NOTE: ALL STRUCTURES WITHIN CARISAL ARE BEING DESIGNED TO ANSI STD. ZONE III. SUCH STRUCTURES SHOULD WITHSTAND AN EARTHQUAKE CLASSIFIED AS ZONE VIII ON THE MODIFIED MERCALLI SCALE OR MAGNITUDE 6 ON THE Richter SCALE.

11.3 Appendix 3

HURRICANES

CariSal's Hurricane Emergency Procedure will be based on the following philosophy:

A. The Plant will be shutdown during a hurricane alert (expected winds in excess of 100 km/hr on the Point Lisas estate) in time for personnel to return home safely. Only persons who

perform essential services will be retained. The shutdown will begin according to the phased sequence below..

B. A group of persons who are required to remain in the Plant during a storm will be chosen from a list of names submitted to management prior to the start of the hurricane season. This group will be alerted twenty-four (24) hours in advance or as information becomes available, so they can attend to personal needs. Twelve (12) hours prior to storm landfall, the group will be advised to report for duty at ETL8***. (Expected Time of Landfall).*** An alternate group will also be established.

C. A three phased approach will be used to provide a proper sequence for hurricane preparation.

PHASE I: Consists of preparatory measures initiated when a potentially dangerous storm is predicted to be less than 36 hrs away from landfall.

PHASE II: Plans for the continuous operation of the plant when information at ETL24 predicts a storm with winds exceeding 75km/hr but less than 100 km/hr with expected landfall less than 12 hrs. All non-essential personnel will be sent home as soon as they could be released. Each Manager will be responsible for the release of their personnel.

PHASE III: Proceed with ESD of the plant at ETL4 if the storm contains winds in excess of 100 km/hr. Only the Hurricane Watch Group will man the Plant after ETL4. The decision to implement Phase 111 rests with the General Manager when the storm ETL is 8 hours.

GENERAL RULES

The following are general rules to be followed in a **Phase 111** situation:

1. A Hurricane Watch Group will be available to fight fires, secure small items, etc. This Group should remain in the control room for personal protection during the height of the storm.
2. Plant shutdown will be in accordance with the ESD Procedures.

PHASE 1 PREPARATIONS

AT ETL36 MAINTENANCE PERSONNEL WILL TAKE THE FOLLOWING PRECAUTIONS:

A. Secure all loose materials, i.e. crates, lumber, drums, insulation, scaffold boards and temporary scaffolding etc.

(NB: Develop checklist).

B. Check all buildings to ensure that all doors and windows are in good condition and operable.

C. Fill mobile equipment, diesel and gasoline storage tanks.

AT ETL24 TAKE THE FOLLOWING PRECAUTIONS:

A. Alert Hurricane Watch Groups.

B. Secure all mobile equipment, Lower all crane booms to ground level.

C. Move all welding machines, air compressors and toolboxes to areas not subject to flooding.

C. Move all non-essential automobile equipment to normal car park.

E. Provide sandbags at specified locations and ensure adequate stocks for emergency purposes.

F. Check Tool stores for adequate supply of flashlight batteries, raincoats etc.

PHASE 11 PREPARATIONS

At ETL12 the General Manager will decide to either continue operating (Phase 11) or Shutdown (Phase 111).

If the Plant remains in the Phase 11 Stage, the Hurricane Watch Group will be used to relieve regularly scheduled employees.

PHASE 111

A. The Hurricane Watch Group will relieve regularly scheduled employees when they report at ETL8. All personnel except the Hurricane Watch Group will be released no later than ETL8 HOURS.

   The Hurricane Watch group will include a security shift detail

B. **The Hurricane Watch group will:**

   i. Provide personnel for fire fighting.

   ii. Provide transport if required.

   iii. Monitor the condition of all Plant buildings and other physical assets.

   iv. Monitor weather reports on radio and provide updated Plant condition status reports to the General Manager..

   v. On request, respond to Community calls / TTEMAS calls

   vi. Provide security.

<u>RESTORING THE CARISAL COMPLEX TO OPERATION</u>

When the storm has passed the General Manager will direct all efforts at getting the Plant back to normal operations.

1. An immediate damage assessment will be made and plans developed to restore normalcy.
3. Special attention will be paid to the aftermath of flooding, or impairments to fire protection equipment.
4. Openings in walls or roofs will be temporarily repaired and the contents of the building covered with tarpaulins to minimize rain damage.
5. Salvage Operations will be initiated immediately.
6. Special care will be exercised around damaged power lines.
7. Process equipment and line integrity checks will be made before startup and all outside utilities will be confirmed ready to support start-up:

   - National Gas Company
   - WASA
   - T&TEC
   - TSTT

11.4 Appendix 4

BOMB THREATS

ALL BOMB THREATS/CRANK CALLS WILL BE TREATED AS REAL.

This general procedure is intended for the guidance of Company personnel and outside agencies for coping with bomb threats and calls received via telephone or other means of communication. It will be used as a guide for all Emergency Groups, and by other persons who will take specific action in the event of an emergency.

COMMUNICATION

Communication must be carried out in a calm "low key" manner to avoid excitement, confusion and panic.

ON HOURS: 7:00 A.M. TO 3:30 P.M.

Any person receiving a bomb threat must immediately and directly contact the General Manager and/or the HSSE Manager.

OFF-HOURS: 3.30 P.M. TO 7:00 A.M.

Any person receiving a bomb threat must immediately and directly contact the Manager of Operations and/or the Safety Manager.

PROCEDURE

A. BOMB THREAT/ CRANK CALLS RECEIVED

When a Bomb Threat or crank call is received by telephone:

(a) DO NOT HANG UP. The person receiving the call should keep the caller talking as long as possible. Keep the conversation going in a normal tone of voice and record as much of the conversation as possible, to learn more about who is placing the call. During discussion find out how many devices are involved.

(b) If the caller does not state the location of the bomb or the time of possible explosion, the person receiving the call should ask the caller for this information.

(c) Inform the caller that the building or area is occupied and detonation of a bomb could result in death or serious injury to innocent people.

(d) Pay particular attention for any strange or peculiar background noises such as traffic noises, motors running, background music, and the type of music, or other noises that might give even a remote clue of the place from where the call is made.

(e) Listen closely to the voice (male/female), voice characteristic, young or old, accents, speech and speech impediment slang, fast or slow talk, or any hint as to the seriousness of the call. Listen also to the language and manner.

B. INFORMATION BY OTHER SOURCES

Notification of Bomb Threats or related acts may also be relayed through newspaper or radio station offices, the police service, or other sources. Administrative personnel, maintenance technicians, or others sometimes receive bomb threats in person. All threats

must be immediately reported to the General Manager and/or the HSSE Manager, who will take appropriate action.

Bomb threats are also received by notes or letters. Personnel who receive such mail should not handle the paper or article any more than is absolutely necessary. The contents of the message should be copied and the original protected to prevent destruction of any evidence.

ON HOURS: INITIAL ACTION BY THE GENERAL MANAGER.

a. Evaluate the threat from available information and decide whether or not it is serious enough to search for a bomb and/or shut down and evacuate one or more areas. Evacuate non-essential personnel from the affected area.

b. Notify the HSSE Manager who will inform security of the threat and instruct them to take specific action (such as restricting traffic into the building and increasing surveillance of personnel if the threat is considered to be serious).

They will be instructed to inform the following of the bomb threat and request assistance:

(i) Couva Police (Phone: 999/636-2333)

(ii) Trinidad and Tobago Fire Services (Phone: 990/636-2255/2864)

5.0 OFF-HOURS: INITIAL ACTION BY SHIFT SUPERVISOR

a. Evaluate the threat from available information and decide whether or not it is serious enough to search for a bomb and/or shut down and evacuate.

b. Notify security of the threat and instruct them to take specific action (such as restricting traffic and increasing surveillance of personnel if the threat is considered to be serious).

Security should also be instructed to call out the relevant personnel in the following order:

(i) General Manager
(ii) HSSE Manager
(ii) Production Manager
(iv) Maintenance Manager
(v) Couva Police (Phone: 999/636-2333)
(vi) T&T Fire Services (Phone: 990/636-2255/2864)

11.5 Appendix 5

MATERIAL SAFETY DATA SHEETS (MSDS)

Note that MSDSs are specific to the manufacturer/producer of the compound. The information contained in the following MSDSs is accurate for the chemical represented. The specific producer of the chemicals that would be used at the CariSal site may, however, differ.

11.5.1 Chlorine

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: CHLORINE

TRADE NAMES/SYNONYMS:
MTG MSDS 22; CHLORINE MOLECULAR; DIATOMIC CHLORINE; DICHLORINE; MOLECULAR CHLORINE; UN 1017; Cl2; MAT04600; RTECS FO2100000

CHEMICAL FAMILY: halogens, gas

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 16 2002

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CHLORINE
CAS NUMBER: 7782-50-5
PERCENTAGE: 100.0

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: yellow or green
PHYSICAL FORM: gas
ODOR: distinct odor, irritating odor
MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract burns, skin burns, eye burns
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat. May ignite combustibles.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: burns, chest pain, difficulty breathing, headache, dizziness, hyperactivity, emotional disturbances, bluish skin color, lung damage, death
LONG TERM EXPOSURE: burns, skin disorders, lack of sense of smell, lung damage
SKIN CONTACT:
SHORT TERM EXPOSURE: burns
LONG TERM EXPOSURE: burns
EYE CONTACT:

SHORT TERM EXPOSURE: burns
LONG TERM EXPOSURE: burns
INGESTION:
SHORT TERM EXPOSURE: ingestion of harmful amounts is unlikely
LONG TERM EXPOSURE: ingestion of harmful amounts is unlikely

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. Give large amounts of water or milk. Allow vomiting to occur. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. Avoid gastric lavage or emesis.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

EXTINGUISHING MEDIA: water

Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents. Large fires: Flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. For small fires, contain and let burn. Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuation radius: 800 meters (1/2 mile).

SECTION 6 ACCIDENTAL RELEASE MEASURES

AIR RELEASE:
Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE:
Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).

WATER RELEASE:
Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Absorb with activated carbon. Collect spilled material using mechanical equipment.

OCCUPATIONAL RELEASE:
Stop leak if possible without personal risk. Avoid contact with combustible materials. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Keep separated from incompatible substances. Store outside or in a detached building. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
CHLORINE:
1 ppm (3 mg/m3) OSHA ceiling
0.5 ppm (1.5 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
1 ppm (3 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
0.5 ppm ACGIH TWA
1 ppm ACGIH STEL
0.5 ppm (1.45 mg/m3) NIOSH recommended ceiling 15 minute(s)

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

5 ppm
Any chemical cartridge respirator with cartridge(s) providing protection against this substance.
Any supplied-air respirator.
10 ppm
Any supplied-air respirator operated in a continuous-flow mode.
Any powered, air-purifying respirator with cartridge(s) providing protection against this substance.
Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against this substance.
Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Escape -
Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: yellow or green
ODOR: distinct odor, irritating odor
MOLECULAR WEIGHT: 70.906
MOLECULAR FORMULA: Cl2
BOILING POINT: -31 F (-35 C)
FREEZING POINT: -150 F (-101 C)
VAPOR PRESSURE: 5168 mmHg @ 21 C
VAPOR DENSITY (air=1): 2.49
SPECIFIC GRAVITY: Not applicable
DENSITY: 3.214 g/L @ 0 C
WATER SOLUBILITY: 1.46% @ 0 C
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: 0.01 ppm
EVAPORATION RATE: Not applicable
VISCOSITY: 0.01327 cP @ 20 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: alkali

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid contact with combustible materials. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

INCOMPATIBILITIES: combustible materials, bases, metals, halogens, metal salts, reducing agents, amines, metal carbide, metal oxides, oxidizing materials, halo carbons, acids

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: chlorine

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

CHLORINE:
TOXICITY DATA:
293 ppm/1 hour(s) inhalation-rat LC50
CARCINOGEN STATUS: ACGIH: A4 -Not Classifiable as a Human Carcinogen
LOCAL EFFECTS:
Corrosive: inhalation, skin, eye
ACUTE TOXICITY LEVEL:
Toxic: inhalation
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart problems
TUMORIGENIC DATA: Available.
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 390 ug/L 96 hour(s) LC50 (Mortality) Orangethroat darter (Etheostoma spectabile)

INVERTEBRATE TOXICITY: 637.5 ug/L 1 hour(s) LC50 (Mortality) Pacific oyster (Crassostrea gigas)

ALGAL TOXICITY: 50-1000 ug/L 23 hour(s) (Population) Algae,phytoplankton,algal mat (Algae)

PHYTOTOXICITY: 20 ug/L 96 day(s) (Growth) Water-milfoil (Myriophyllum spicatum)

SECTION 13 DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Chlorine
ID NUMBER: UN1017
HAZARD CLASS OR DIVISION: 2.3
LABELING REQUIREMENTS: 2.3; 8
ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone B

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Chlorine
ID NUMBER: UN1017
CLASSIFICATION: 2.3, 8

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
CHLORINE: 10 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
CHLORINE: 100 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
CHLORINE: 10 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
CHLORINE

OSHA PROCESS SAFETY (29CFR1910.119):
CHLORINE: 1500 LBS TQ

STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: ACD1E

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

SECTION 16 OTHER INFORMATION

MSDS SUMMARY OF CHANGES
SECTION 15 REGULATORY INFORMATION

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11.5.2 Hydrogen

AIR PRODUCTS

MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT IDENTIFICATION

PRODUCT NAME: **Hydrogen, compressed**
CHEMICAL NAME: Hydrogen **FORMULA:** H_2
SYNONYMS: None
MANUFACTURER: **Air Products and Chemicals, Inc.**
7201 Hamilton Boulevard
Allentown, PA 18195-1501
PRODUCT INFORMATION: 1-800-752-1597
MSDS NUMBER: 1009 **REVISION:** 4
REVISION DATE: June 1994

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hydrogen is sold as pure product >99%

CAS NUMBER: 1333-74-0

EXPOSURE LIMITS:
OSHA: None **ACGIH:** Simple asphyxiant

SECTION 3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Hydrogen is a flammable, colorless, odorless, compressed gas packaged in cylinders at high pressure. It poses an immediate fire and explosive hazard when concentrations exceed 4%. It is much lighter than air and burns with an invisible flame. High concentrations that will cause suffocation are within the flammable range and must not be entered.

EMERGENCY TELEPHONE NUMBERS

(800) 523-9374 Continental U.S., Canada, and Puerto Rico
(610) 481-7711 other locations

POTENTIAL HEALTH EFFECTS INFORMATION:

INHALATION: Asphyxiant. It should be noted that before suffocation could occur, the lower flammability limit of hydrogen in air would be exceeded possibly causing both an oxygen-deficient and explosive atmosphere. Exposure to moderate concentrations may cause dizziness, headache, nausea and unconsciousness. Exposure to atmospheres containing 8-10% or less oxygen will quickly bring about unconsciousness without warning leaving individuals unable to protect themselves. Lack of sufficient oxygen may cause serious injury or death.

EYE CONTACT: None

SKIN CONTACT: None

CHRONIC EFFECTS: None

OTHER EFFECTS OF OVEREXPOSURE: None

EXPOSURE INFORMATION:

ROUTE OF ENTRY: Inhalation

TARGET ORGANS: None

EFFECT: Asphyxiation (suffocation)

SYMPTOMS: Exposure to an oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness, and death.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None

CARCINOGENIC POTENTIAL: Hydrogen is not listed by NTP, OSHA or IARC.

SECTION 4. FIRST AID

INHALATION: Persons suffering from lack of oxygen should be removed to fresh air. If victim is not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

SKIN CONTACT: None

EYE CONTACT: None

INGESTION: None

NOTES TO PHYSICIAN: None

SECTION 5. FIRE AND EXPLOSION

FLASH POINT:	AUTOIGNITION:	FLAMMABLE LIMITS:
Flammable gas	565.5_C (1050_F)	**LOWER:** 4% **UPPER:** 74%

EXTINGUISHING MEDIA: CO_2, dry chemical, water spray or fog for surrounding area. Do not extinguish until hydrogen source is shut off.

HAZARDOUS COMBUSTION PRODUCTS: None

SPECIAL FIRE FIGHTING INSTRUCTIONS: Evacuate all personnel from danger area. Immediately cool container with water spray from maximum distance, taking care not to extinguish flames. If flames are accidentally extinguished, explosive re-ignition may occur. Stop flow of gas if without risk while continuing cooling water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Burns with a pale blue, nearly invisible flame. Hydrogen is easily ignited with low-ignition energy, including static electricity. Hydrogen is lighter than air and can accumulate in the upper sections of enclosed spaces. Pressure in a container can build up due to heat, and it may rupture if pressure relief devices should fail to function.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Evacuate immediate area. Eliminate any possible sources of ignition, and provide maximum explosion-proof ventilation. Shut off source of hydrogen, if possible. If leaking from cylinder, or valve, call the Air Products' emergency phone number. The presence of a hydrogen flame can be detected by approaching cautiously with an outstretched straw broom to make the flame visible.

SECTION 7. HANDLING AND STORAGE

STORAGE: Specific requirements are listed in NFPA 50A. Cylinder storage locations should be well-protected, well-ventilated, dry, and separated from combustible materials. Cylinders should never knowingly be allowed to reach a temperature exceeding 125 _F (52 _C). Cylinders of hydrogen should be separated from oxygen cylinders or other oxidizers by a minimum distance of 20 ft., or by a barrier of noncombustible material at least 5 ft. high having a fire resistance rating of at least _ hour.

Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage; do not drag, roll, slide or drop. Use a suitable hand truck for cylinder movement. Post "No Smoking or Open Flames" signs in the storage areas. There should be no sources of ignition. All electrical equipment should be explosion proof in the storage and use areas. Storage areas must meet national electric codes for class 1 hazardous areas.

HANDLING: Do not "open" hydrogen cylinder valve before connecting it, since self-ignition may occur. Hydrogen is the lightest gas known and may collect in the top of buildings with out proper ventilation. It may leak out of a system which is gas-tight for air or other gases. Leak check system with leak detection solution, never with flame. If user experiences difficulty operating cylinder valve, discontinue use and contact supplier. Use only approved CGA connections. DO NOT USE ADAPTERS. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

SPECIAL PRECAUTIONS: Use piping and equipment adequately designed to withstand pressures to be encountered. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow.

SECTION 8. PERSONAL PROTECTION/EXPOSURE CONTROLS

ENGINEERING CONTROLS: Provide natural or explosion-proof ventilation adequate to ensure hydrogen does not reach its lower explosive limit of 4%.

RESPIRATORY PROTECTION:

General Use: None

Emergency Use: Air supplied respirators are required in oxygen-deficient atmospheres. Before entering area you must check for flammable or oxygen-deficient atmospheres.

PROTECTIVE GLOVES: Work gloves are recommended when handling cylinders.

EYE PROTECTION: Safety glasses are recommended when handling cylinders.

OTHER PROTECTIVE EQUIPMENT: Safety shoes are recommended when handling cylinders.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND STATE: Colorless gas at normal temperature and pressure.

ODOR: Odorless

MOLECULAR WEIGHT: 2.016

BOILING POINT (1 atm): -423.0 _F (-252.8 _C)

SPECIFIC GRAVITY (Air =1): 0.06960

FREEZING POINT/MELTING POINT: -434.5 °F (-259.2 _C)

VAPOR PRESSURE (at 70 °F): Not applicable

GAS DENSITY (At 70_F (21.1_C) and 1 atm): 0.00521 lb/ft^3 (0.08342 kg/m^3)

SOLUBILITY IN WATER (Vol/Vol at 60_ F (15.6_C)): 0.019

SPECIFIC VOLUME (At 70_F (21.1_C) and 1 atm): 192 ft^3/lb (11.99m^3/kg)

SECTION 10. REACTIVITY/STABILITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: None

INCOMPATIBILITY (Materials to Avoid): Oxidizing agents. Some steels are susceptible to hydrogen embrittlement at high pressures and temperatures.

REACTIVITY:

A) **HAZARDOUS DECOMPOSITION PRODUCTS:** None
B) **HAZARDOUS POLYMERIZATION:** Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

Hydrogen is a simple asphyxiant.

SECTION 12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected. Hydrogen does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Hydrogen is not listed as a marine pollutant by DOT (49 CFR Part 171).

SECTION 13. DISPOSAL

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused product in the cylinder. Return to supplier for safe disposal.

Residual product within process system may be vented at a controlled rate, to the atmosphere through a vent stack that discharges to an elevated point. This stack should be in an isolated area away from ignition sources.

SECTION 14. TRANSPORTATION

DOT/IMO SHIPPING NAME: Hydrogen, compressed

HAZARD CLASS: 2.1 (Flammable Gas)

IDENTIFICATION NUMBER: UN1049

PRODUCT RQ: None

SHIPPING LABEL(s): Flammable gas.

PLACARD (When required): Flammable gas.

SPECIAL SHIPPING INFORMATION: Cylinder should be transported in a secure upright position in a well ventilated truck. NEVER TRANSPORT IN PASSENGER COMPARTMENT OF A VEHICLE.

Shipment of compressed gas cylinders which have not been filled with the owner's consent is a violation of Federal law (49 CFR Part 173.301 (b)).

SECTION 15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

EPA - ENVIRONMENTAL PROTECTION AGENCY

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: Superfund Amendment and Reauthorization Act

SECTION 302/304: Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).

Extremely Hazardous Substances: None

Threshold Planning Quantity (TPQ): None

SECTIONS 311/312: Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370). The hazard classes for this product are:

IMMEDIATE:	No	PRESSURE:	Yes
DELAYED:	No	REACTIVITY:	No
		FLAMMABLE:	Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Hydrogen does not require reporting under Section 313

40 CFR PART 68: Risk Management for Chemical Accidental Release. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Hydrogen is not listed as a regulated substance. However, any process that involves a flammable gas on site in one location, in quantities of 10,000 pounds (4,553 kg) or greater, is covered under this regulation.

TSCA: Toxic Substance Control Act: Hydrogen is listed on the TSCA inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Hydrogen is not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable gas on site in one location, in quantities of 10,000 pounds (4,553 kg) or greater is covered under this regulation unless it is used as fuel.

SECTION 16. OTHER INFORMATION

OTHER INFORMATION:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH:	= 0	HEALTH:	= 0
FLAMMABILITY:	= 4	FLAMMABILITY:	= 4
REACTIVITY:	= 0	REACTIVITY:	= 0

SPECIAL: = SA (CGA recommends this to designate simple asphyxiant)

11.5.3 Hydrochloric Acid (HCL)

Material Data Safety Sheet (MSDS): HYDROCHLORIC ACID

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1. Product Identification	7. Handling and Storage
2. Composition	8. Exposure Controls/Personal Protection
3. Hazards Identification	9. Physical and Chemical Properties
4. First Aid Measures	10. Stability and Reactivity
5. Fire Fighting Measures	11. Toxicological Information
6. Accidental Release Measures	12. Ecological Information
	13. Disposal Considerations
	16. Other Information

Note: This information sheet has been re-formatted for better clarity by the Department of Earth Sciences.

Some of the data such as information on shipping and weapons treaties were intentionally left out. If you

want to look at the complete MSDS, you can either check one of the hardcopy versions in the Department,

contact the manufacturer, or check one of the various Web-based databases such as those compiled

by BU's Office of Environmental Health & Safety (www.bu.edu/ehs/msds/index.htm).

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1. Product Identification

MSDS Name: **Hydrochloric Acid**, Reagent ACS

Chlorohydric acid, hydrogen chloride, muriatic acid, spirits of salt.
Company Identification: Acros Organics N.V.
One Reagent Lane
Fairlawn, NJ 07410
For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

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2. Composition/Information on Ingredients

CAS#	*Chemical Name*	*%*	*EINECS#*
7647-01-0	Hydrochloric acid, reagent ACS	37%	231-595-7
7732-18-5	Water	Balance	231-791-2

Hazard Symbols: C
Risk Phrases: 34 37

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3. Hazards Identification

Emergency Overview

EMERGENCY OVERVIEW
Appearance: Clear, colorless to faintly yellow.
Danger! Corrosive. Sensitizer. Causes eye and skin burns. May cause severe respiratory and digestive tract irritation with possible
burns.
Target Organs: None.

Potential Health Effects

Eye:
May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns. May cause painful sensitization to light. May cause conjunctivitis.

Skin:
May be absorbed through the skin in harmful amounts. Contact with liquid is corrosive and causes severe burns and ulceration. May cause photosensitization in certain individuals.

Ingestion:
May cause circulatory system failure. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause
corrosion and permanent tissue destruction of the esophagus and digestive tract.

Inhalation:
Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances.

Chronic:
Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. May cause conjunctivitis and photosensitization.

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4. First Aid Measures

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid
immediately. Do NOT allow victim to rub or keep eyes closed.

Skin:
Get medical aid. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

Ingestion:
Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation:
Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:
Treat symptomatically and supportively.

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5. Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full
protective gear. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool.
Extinguishing Media:
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: Not published.
Explosion Limits, Lower: Not available.
Upper: Not available.

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6. Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Large spills may be neutralized with dilute alkaline solutions of soda ash, or lime. Absorb spill using an absorbent, non-combustible
material such as earth, sand, or vermiculite.

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7. Handling and Storage

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get on skin
or in eyes. Do not ingest or inhale.

Storage:
Keep away from heat and flame. Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances.

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8. Exposure Controls/Personal Protection

Engineering Controls:
Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name ACGIH NIOSH OSHA - Final PELs
Hydrochloric acid, reagent ACS C 5 ppm; C 7.5 mg/m3 50 ppm IDLH C 5 ppm; C 7 mg/m3

OSHA Vacated PELs:
Hydrochloric acid, reagent ACS:
No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face
protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:
Wear appropriate protective gloves to prevent skin exposure.
Clothing:
Wear appropriate protective clothing to prevent skin exposure.
Respirators:
Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

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9. Physical and Chemical Properties (Hydrochloric Acid)

Appearance:	Clear, colorless to faintly yellow liquid
Odor:	Strong, pungent
Solubility:	823g/L water at 32F
Density:	1.16-1.19
pH:	1.1 (0.1N sol)
% Volatiles by volume @ 21C (70F):	Not available
Boiling Point:	230 deg F
Melting Point:	-101 deg F
Vapor Density (Air=1):	1.257
Vapor Pressure:	160 mm Hg
Evaporation Rate (Butyl acetate =1):	2.0

Molecular Formula: HCl
Molecular Weight: 36.46

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10. Stability and Reactivity

Chemical Stability:
Stable under normal temperatures and pressures.

Conditions to Avoid:
Incompatible materials, light.

Incompatibilities with Other Materials:
Acetate, acetic anhydride, alcohols + hydrogen cyanide, 2-aminoethanol, ammonium hydroxide, calcium carbide, calcium phosphide, cesium acetylene carbide, cesium carbide, chlorosulfonic acid, 1,1-difluoroethylene, ethylene diamine, ethyleneimine, fluorine, lithium silicide, magnesium boride, mercuric sulfate, oleum, perchloric acid, potassium permanganate, b-propiolactone, propylene oxide, rubidum acetylene carbide, rubidum carbide, silver perchlorate + carbon tetrachloride, sodium, sodium hydroxide, sulfuric acid, uranium phosphide, vinyl acetate. Substance polymerizes on contact with aldehydes or epoxides.

Hazardous Decomposition Products:
Hydrogen chloride, chlorine, carbon monoxide, carbon dioxide,
hydrogen gas.

Hazardous Polymerization: May occur.

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11. Toxicological Information

RTECS#:
CAS# 7647-01-0: MW4025000
CAS# 7732-18-5: ZC0110000
LD50/LC50:
CAS# 7647-01-0: Inhalation, mouse: LC50 =1108 ppm/1H; Inhalation, rat: LC50 =3124 ppm/1H; Oral, rabbit: LD50 = 900 mg/kg.
CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg.

Carcinogenicity:
Hydrochloric acid, reagent ACS -
IARC: Group 3 carcinogen
Epidemiology:
No information available.
Teratogenicity:
Embryo or Fetus: Stunted fetus, ihl-rat TCLo=450 mg/m3/1H Specific Developmental Abnormalities: homeostasis, ihl-rat TCLo=450 mg/m3/1H.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
None.

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12. Ecological Information

Ecotoxicity:
Trout LC100=10 mg/L/24H Shrimp LC50=100-330 ppm Starfish LC50=100-330mg/L/48H Shore crab LC50=240 mg/L/48H Chronic plant toxicity=100 ppm

Environmental Fate:
Substance will neutralize soil carbonate-based components.

Physical/Chemical:
No information available.

Other:
None.

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13. Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration of Contaminants: None listed.
RCRA D-Series Chronic Toxicity Reference Levels: None listed.
RCRA F-Series: None listed.
RCRA P-Series: None listed.
RCRA U-Series: None listed

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16. Other Information

MSDS Creation Date: 11/09/1995 Revision #4 Date: 4/28/1998

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of

merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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11.5.4 Caustic Soda

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Bayer Emergency Phone:	(412) 923-1800
Bayer Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name:	CAUSTIC SODA SOLUTION (50%)
Material Number:	3490347
Chemical Family:	Sodium hydroxide solution

2. Hazards Identification

Emergency Overview

DANGER! Color: Clear, Opaque **Form:** liquid **Odor:** Odorless.
Water runoff from fire fighting may be corrosive. Irritating gases/fumes may be given off during burning or thermal decomposition. Contact with metals liberates hydrogen gas. Reacts violently with water. Causes respiratory tract burns. Causes skin burns. May be harmful if absorbed through skin. Causes eye burns. Causes digestive tract burns. Harmful if swallowed.

Potential Health Effects

Primary Routes of Entry:	Skin Contact, Eye Contact, Ingestion, Inhalation
Medical Conditions Aggravated by Exposure:	Skin disorders, Respiratory disorders, Eye disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation
For Component: Sodium hydroxide
Corrosive with symptoms of coughing, burning, ulceration, and pain.

Skin
Acute Skin
For Component: Sodium hydroxide
Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage.

Eye

Acute Eye
For Component: Sodium hydroxide
Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

Ingestion
Acute Ingestion
For Component: Sodium hydroxide
Harmful if swallowed. Corrosive to the digestive tract with symptoms of burning and ulceration.

General Effects of Exposure
Chronic Effects of Exposure
For Product: CAUSTIC SODA SOLUTION (50%)
Repeated or prolonged overexposure may cause effects as noted under acute health effects.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous Components

Weight %	Components	CAS-No.
50%	Sodium hydroxide	1310-73-2

4. First Aid Measures

Eye Contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call a physician immediately.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Immediately remove contaminated clothing and shoes. Call a physician immediately. Wash clothing and shoes before reuse.

Inhalation
If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration using a pocket mask type resuscitator. Call a physician immediately.

Ingestion
Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Never give anything by mouth to an unconscious person.

5. Fire-Fighting Measures

Suitable Extinguishing Media: carbon dioxide (CO_2), foam, dry chemical

Special Fire Fighting Procedures
Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

Unusual Fire/Explosion Hazards

Water runoff from fire fighting may be corrosive. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Contact with metals liberates flammable gas.

6. Accidental release measures

Spill and Leak Procedures
Cleanup personnel must use appropriate personal protective equipment. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems. Decontaminant/Neutralizer: Dilute hydrochloric acid solution. Wash spill area with water. Collect wash water for approved disposal.

7. Handling and Storage

Storage Period
Not Established

Handling/Storage Precautions
Do not breathe vapours or spray mist. Do not get on skin or clothing. Do not get in eyes. Do not taste or swallow. Use only with adequate ventilation/personal protection. Wash thoroughly after handling. Keep container closed when not in use.

Further Info on Storage Conditions
Material can be stored safely at ambient temperatures. Do not expose to direct sunlight. Protect from freezing. This product is corrosive to metal(s). Avoid contact with moisture/water. Product can react with water.

8. Exposure Controls / Personal Protection

Sodium hydroxide (1310-73-2)
US. ACGIH Threshold Limit Values
Ceiling Limit Value: 2 mg/m3
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
PEL: 2 mg/m3

Industrial Hygiene/Ventilation Measures
General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate airborne concentration standards/guidelines.

Respiratory Protection
In case of insufficient ventilation wear suitable respiratory equipment.

Hand Protection
Permeation resistant gloves.

Eye Protection
Chemical resistant goggles must be worn., Chemical safety goggles in combination with a full face shield if a splash hazard exists.

Skin and body protection

Permeation resistant clothing and foot protection.

Additional Protective Measures
Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Emergency showers and eye wash stations should be available.

9. Physical and chemical properties

Form:	liquid
Color:	Clear, Opaque
Odor:	Odorless
pH:	14
Freezing Point:	12 °C (53.6 °F)
Boiling Point/Range:	140 °C (284 °F)
Flash Point:	Not applicable (water based product)
Vapor Pressure:	13 mmHg @ 15.56 °C (60 °F)
Specific Gravity:	1.53 @ 15.56 °C (60 °F)
Solubility in Water:	Soluble

10. Stability and Reactivity

Hazardous Reactions
Hazardous polymerization does not occur.

Stability
Stable

Materials to avoid
Combustible material, Acids, Halogenated compounds, Halogens, metals, Oxidizing agents, Peroxides, Organic nitro compounds

Conditions to avoid
Avoid contact with moisture / water. Do not expose to direct sunlight. Protect from freezing.

Hazardous decomposition products
By Fire and Thermal Decomposition: sodium oxides, other potentially toxic fumes
Other Decomposition Products: Hydrogen;

11. Toxicological Information

Toxicity Data for Sodium hydroxide
Acute Oral Toxicity
LD50: 140 - 340 mg/kg (Rat)

Acute dermal toxicity
LD50: 1,350 mg/kg (rabbit)

Skin Irritation
rabbit, Corrosive

Eye Irritation

rabbit, Corrosive

Mutagenicity
Genetic Toxicity in Vitro:
Ames: negative (Salmonella typhimurium)
Positive and negative results were seen in various in vitro studies.
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (mouse, Male/Female, intraperitoneal)

12. Ecological Information

Ecological Data for Sodium hydroxide
Acute and Prolonged Toxicity to Fish
LC50: 45.4 mg/L (50 %, pH 8) (Rainbow (Donaldson)Trout (Oncorhynchus mykiss), 96 hrs)

Acute Toxicity to Aquatic Invertebrates
LC100: 156 mg/L (pH 9.1 - 9.5) (Water flea (Daphnia magna))

Toxicity to Aquatic Plants
The freshwater algae are destroyed at a pH of >8.5.

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Empty Container Precautions
Recondition or dispose of empty container in accordance with governmental regulations. Do not reuse empty container without proper cleaning. Label precautions also apply to this container when empty.

14. Transportation information

Land transport (DOT)

Proper Shipping Name:	Sodium hydroxide solution
Hazard Class or Division:	8
UN/NA Number:	UN1824
Packaging Group:	II
Hazard Label(s):	Corrosive

RSPA/DOT Regulated Components:
Sodium hydroxide

Reportable Quantity: 2,000 lb

Sea transport (IMDG)

Proper Shipping Name:	SODIUM HYDROXIDE SOLUTION
Hazard Class or Division:	8
UN-No:	UN1824
Packaging Group:	II

Hazard Label(s): Corrosive

Air transport (ICAO/IATA)

Proper Shipping Name: Sodium hydroxide solution
Hazard Class or Division: 8
UN-No: UN1824
Packaging Group: II
Hazard Label(s): Corrosive

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components	
Sodium hydroxide	Reportable quantity: 1,000 lbs

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Reactivity Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):
Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:
Components
None

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
When discarded in its purchased form, this product meets the criteria of corrosivity, and should be managed as a hazardous waste (EPA Hazardous Waste Number D002). (40 CFR 261.20-24)

State Right-To-Know Information
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight %	Components	CAS-No.
50%	Sodium hydroxide	1310-73-2
50%	Water	7732-18-5

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight %	Components	CAS-No.

50%	Sodium hydroxide	1310-73-2

California Prop. 65:
To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other Information

NFPA 704M Rating

Health	3
Flammability	0
Reactivity	2
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	3*
Flammability	0
Physical Hazard	2

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person:	Product Safety Department
Telephone:	(412) 777-2835
MSDS Number:	R307100
Version Date:	06/26/2007
Report Version:	1.12

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of Bayer MaterialScience LLC. The information in this MSDS relates only to the specific material designated herein. Bayer MaterialScience LLC assumes no legal responsibility for use of or reliance upon the information in this MSDS.

11.5.5 Bleach

12.5% SODIUM HYPOCHLORITE SOLUTION

Material Safety Data Sheet

Emergency 24 Hour Telephone: CHEMTREC 800.424.9300

Corporate Headquarters: Hasa Inc.
23119 Drayton Street
Saugus, California 91350
Telephone • 661.259.5848
Fax • 661.259.1538

IDENTIFICATION OF PRODUCT	
Product Name:	HASA 12.5% Sodium Hypochlorite Solution
Common Chemical Names:	Hypochlorite solution sodium salt, sodium hypochlorite
Chemical Names of Ingredients [>1.0% by weight]:	Sodium hypochlorite
Chemical Family:	Inorganic halogen compound
CAS Registry Number:	7681-52-9
Empirical Formula:	NaOCl
Molecular Weight:	74.45

PHYSICAL AND CHEMICAL PROPERTIES			
Vapor Pressure:	12.1 mm Hg at 20ºC [12.5% solution]	**Flash Point:**	Not Applicable.
Weight/Gallon:	10.0 lbs. (4.54 kg.)	**pH:**	11.2 – 11.4
Density [liquid]:	1.20 at 20ºC (68ºF)	**Odor:**	Slight Bleach
Bulk Density:	Not Applicable.	**Boiling Point:**	Decomposes
Melting Point:	Not Applicable.	**Freezing Point:**	-20° Fahrenheit
Physical State:	Liquid Solution	**Color:**	Straw Yellow
Solubility in Water:	Complete	**Stability:**	Stable

PHYSICAL HAZARDS	
Potential for Fire:	None. Nonflammable and combustible liquid.
Potential for Explosion:	None. Nonflammable and combustible liquid.
Reactivity:	Violent reactions with amines, ammonium aldehyde, ammonium carbonate, aziridine, methanol, phenylacetonitrile, ammonium nitrate, ammonium oxylate, ammonium phosphate, cellulose, ethylene imine. Do not mix acids, aqua ammonia, or other organic or inorganic chemicals with this product.

HEALTH HAZARDS	
Signs and Symptoms of Exposure:	Eyes and skin irritation. Chemical burns to broken skin.
Medical Conditions Aggravated by Exposure:	No data available.
Oral [ingestion] LD_{50}:	No data available.
Dermal [skin absorption] LD_{50}:	No data available.
Inhalation [breathing] LC_{50}:	No data available.
Eye Irritation:	Irritating. May cause eye damage.
Skin Irritation:	Mild irritation. Not considered to be a skin sensitizer.
OSHA PEL:	None established.
ACGIH TLV/TWA:	None established.

POTENTIAL ROUTE [S] OF ENTRY	
Inhalation [Breathing]:	Unlikely to occur. Vapor may cause irritation to upper respiratory tract.
Dermal [Skin]:	Contact with broken skin may cause burning, blistering, and tissue destruction if not washed off immediately.
Eyes:	Corrosive to eyes.
Ingestion:	Not anticipated. May cause severe chemical burns to esophagus and to stomach lining.

CARCINOGENIC [CANCER POTENTIAL] INFORMATION	
National Toxicological Program [NTP] ***Sixth Annual Report on Carcinogens:***	Not listed.
International Agency for Research on Cancer [IARC] Monographs**, V. 1-53, Supps. 1-8:**	Not listed.
Listed by Federal OSHA as Carcinogens:	Not listed.

Safe Drinking Water and Toxic Enforcement Act of 1986 **[Proposition 65, California only]:**

Small quantities – less than 100 ppm (parts per million) – of impurities, including bromates, may be found in all chlorinating products, including this product. Bromates are derived from bromides, which are present in sodium chloride (table salt) from which chlorine is manufactured. Additional small quantities of bromates may be generated during the disinfection process. Bromates are known by the State of California to cause cancer when administered by the oral (drinking or ingesting) route. Read and follow label directions and use care when handling or using this product. The US Environmental Protection Agency has established a maximum contaminant level (MCL) for bromates in drinking water at 10 ppb (parts per billion). Application of this product in accordance with label directions at use dilution will not exceed this level.

This warning is provided pursuant to Proposition 65, the Safe Drinking Water and Toxic Enforcement act of 1986, Chapter 6.6 of the California Health and Safety Code, which requires the Governor of California to publish a list of chemicals "known to the state to cause cancer or reproductive toxicity." This list is compiled in accordance with the procedures established under the proposition, and can be obtained on the internet from California's Office of Environmental Health Hazard Assessment at http://www.oehha.ca.gov. There are over 700 chemical substances on this list.

GENERAL PRECAUTIONS FOR SAFE USE AND HANDLING
Open containers carefully. Sodium hypochlorite solutions are packaged with vented closures. Do not use containers which are leaking or show evidence of having leaked. Mix only with water. Do not mix with other chemicals. Use clean, dry utensils when mixing. Do not discharge this product or mixtures of this product into lakes, streams, ponds, bays, estuaries, or the ocean. Sodium hypochlorite is toxic to aquatic organisms at very low levels.

PERSONAL PROTECTION AND HYGIENE
Wear goggles or face shield and rubber gloves when handling. Remove and wash contaminated clothing before reuse. Wash hands after handling.

CLEAN-UP OF SPILLS
Store this product in a cool, dry area, away from sunlight and heat to avoid deterioration. In case of spill, flood area where spill has occurred with large quantities of water. With permission from local authorities, diluted product may be flushed to a sanitary sewer. Product may also be absorbed with sand or diatomaceous earth. Absorbed products must be disposed of in accordance with applicable Federal, State, and/or local regulations. Contact HASA, Inc. for guidance.

FIRST AID	
Eye Contact:	Flush with water. Remove contact lenses [if applicable]. Hold eyelids open. Continue flushing with water for 15 minutes. Get prompt medical attention.
Skin Contact:	Wash affected area with water for 15 minutes. Get medical attention.
Ingestion [swallowing]:	Drink large quantities of milk or gelatin solutions. If these are not available drink large quantities of water. DO NOT induce vomiting. DO NOT give vinegar or other acids. Get prompt medical attention.

FEDERAL/STATE LISTS/REGISTRATION/S/REPORTING REQUIREMENTS	
CERCLA Hazardous Substance [Section 1010 [4], P.L. 96-510]:	RQ=100 lbs [80 gallons for 12.5% solution]
Extremely Hazardous Substance [40 CFR 355, Appendix A]:	Not listed.
Pesticide Product 7 U.S.C. 136 et seq.:	Registered as a pesticide product by Federal EPA.
Toxic Substance under TSCA:	Not reported.
Pesticide Product [various State Laws]:	Registered as pesticide product in states where marked.

MATERIAL CLASSIFICATION	
OSHA Hazard Communication Standard, Department of Labor, Occupational Safety and Health Division, 29 CFR 1910.1200:	Irritant

Hazardous Materials Transportation Regulations, Department of Transportation (Federal) 49 CFR 172.101	
Proper Shipping Description [1 gallon or less]:	Consumer Commodity, ORM-D
Proper Shipping Description [greater than 1 gallon]:	Hypochlorite Solutions, 8, UN1791, P.G. III

National Fire Protection Association NFPA 704 [1990]:	2-0-0
BOCA National Fire Prevention Code/National Building Code [1999 editions]:	Irritant
Standard Fire Prevention Code/Standard Building Code [1997 editions]:	Irritant
Uniform Fire Code/Uniform Building Code [1997 editions]:	Irritant
Uniform Fire Code Standards 79-3, Uniform Fire Code, V. II [1997 edition]:	2-0-0

RETURNABLE CONTAINERS
Returnable (deposit) containers must be resealed and the contents drained therefrom prior to return to the distributor or manufacturer for credit. Do not offer leaking or damaged containers for transportation.Call HASA, Inc. or your distributor for instructions.

Please Note: The information contained herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge and belief. NO WARRANTY OR GUARANTEE, expressed or implied, is made regarding the product performance, product stability, or as to any other condition of use, handling, transportation, and storage. Customer use, handling, transportation, and storage may involve additional safety and/or performance considerations. Our technical personnel will be happy to respond to questions regarding safe handling, storage, transportation and use procedures. The safe handling, storage, transportation and use procedures remain the sole responsibility of the customer. No suggestions for handling, storage, transportation or use are intended as or to be construed as recommendations which may infringe on any existing patents or violate any Federal, State, and/or local law and/or regulation, ordinance, standard, etc.. This Material Safety Data Sheet has been prepared by HASA, Inc. staff from test reports and other information available in the public domain.

11.5.6 Sodium Bisulfite

ScienceLab.com
Chemicals & Laboratory Equipment

Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Sodium bisulfite MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium bisulfite

Catalog Codes: SLS3526, SLS1309

CAS#: 7631-90-5

RTECS: VZ2000000

TSCA: TSCA 8(b) inventory: Sodium bisulfite

CI#: Not available.

Synonym: Sulfurous acid, monosodium salt; Sulfurous acid, monosodium salt; Sodium sulhydrate; Sodium hydrogen sulfite; Sodium acid sulfite; Monosodium sulfite; Hydrogen sulfite sodium

Chemical Name: Sodium Bisulfite

Chemical Formula: NaHSO3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium bisulfite	7631-90-5	100

Toxicological Data on Ingredients: Sodium bisulfite: ORAL (LD50): Acute: 2000 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of inhalation (lung irritant).
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to lungs, skin.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 5 (mg/m3) from OSHA (PEL) [United States] Inhalation
TWA: 5 (mg/m3) from ACGIH (TLV) [United States] Inhalation
TWA: 5 (mg/m3) [United States] Inhalation
TWA: 5 (mg/m3) [United Kingdom (UK)] Inhalation
TWA: 5 (mg/m3) [Canada] InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Sulfurous. (Slight.)

Taste: Disagreeable.

Molecular Weight: 104.07 g/mole

Color: White. Off-white.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Decomposes.

Critical Temperature: Not available.

Specific Gravity: 1.48 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in hot water.
Soluble in cold water.
Soluble in 3.5 parts cold water.
Soluble in 2 parts boiling water.
Soluble in 70 parts alcohol
Insoluble in liquid chloride, ammonia.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Slowly oxidized to sulfate on exposure to air.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 2000 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.
May cause damage to the following organs: lungs, skin.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May affect genetic material (mutagenic).
May cause cancer based on animal test data. No human data found.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:

Skin: Causes skin irritation.
Eyes: Causes eye irritation.
Inhalation: Can cause respiratory tract irritation with cough, wheezing, and shortness of breath. It can produce anaphylaxis or other hypersensivity reactions in some sensitized individuals.
Ingestion: May be harmful if swallowed. It may cause nausea, vomiting, diarrhea, abdominal pain, gastric hemorrhage. Extremely large amounts may affect behavior/central nervous system and may produce central nervous system stimulation, irritation, seizures and may also cause, cyanosis, respiratory depression, apnea, circulatory disturbances, hypotension and cardiovascular collapse. May cause asthmatic reaction in sensitized individuals.
Chronic Potential Health Effects:
Inhalation: Prolonged or repeated inhalation may cause bronchitis to develop with cough, phlegm, and/or shortness of breath. It can cause an asthma-like allergy or other hypersensivity reactions such as anaphylaxis, angioedema, bronchoconstriction, flushing, diaphoresis, urtiacaria, tachycardia, and hypotension in sensitized individuals. Futures exposures may cause shortness of breath, wheezing, cough, and/or chest tightness.
Skin: Prolonged or repeated skin contact can cause dermatitis.
Ingestion: Prolonged or repeated ingestion may affect the liver, and blood

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Sodium bisulfite
Illinois toxic substances disclosure to employee act: Sodium bisulfite
Illinois chemical safety act: Sodium bisulfite
New York release reporting list: Sodium bisulfite
Pennsylvania RTK: Sodium bisulfite
Minnesota: Sodium bisulfite
Massachusetts RTK: Sodium bisulfite
Massachusetts spill list: Sodium bisulfite
New Jersey: Sodium bisulfite

New Jersey spill list: Sodium bisulfite
Louisiana spill reporting: Sodium bisulfite
California Director's List of Hazardous Substances: Sodium bisulfite
TSCA 8(b) inventory: Sodium bisulfite
TSCA 8(a) PAIR: Sodium bisulfite
TSCA 8(d) H and S data reporting: Sodium bisulfite: Effective date: 1/26/94; Sunset date: 6/30/98
CERCLA: Hazardous substances.: Sodium bisulfite: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R22- Harmful if swallowed.
R31- Contact with acids liberates toxic gas.
S25- Avoid contact with eyes.
S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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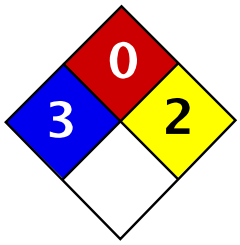

Health	3
Fire	0
Reactivity	2
Personal Protection	

Material Safety Data Sheet
Sulfuric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sulfuric acid

Catalog Codes: SLS2539, SLS1741, SLS3166, SLS2371, SLS3793

CAS#: 7664-93-9

RTECS: WS5600000

TSCA: TSCA 8(b) inventory: Sulfuric acid

CI#: Not applicable.

Synonym: Oil of Vitriol; Sulfuric Acid

Chemical Name: Hydrogen sulfate

Chemical Formula: H2-SO4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	95 - 98

Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m 2 hours [Rat]. 320 mg/m 2 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion:
Products of combustion are not available since material is non-flammable. However, products of decompostion include fumes of oxides of sulfur. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Fire Hazards in Presence of Various Substances: Combustible materials

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Slightly explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid.
White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact.
May ignite other combustible materials.
May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phorphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.

Special Remarks on Explosion Hazards:
Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver
trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picratres, fulminats, dienes, alcohols (when heated)
Nitramide decomposes explosively on contact with concentrated sulfuric acid.
1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decompositon.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid.
Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.
May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:
Hygroscopic. Reacts. violently with water. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 STEL: 3 (mg/m3) [Australia] Inhalation
TWA: 1 (mg/m3) from OSHA (PEL) [United States] Inhalation
TWA: 1 STEL: 3 (mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation
TWA: 1 (mg/m3) from NIOSH [United States] Inhalation
TWA: 1 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Thick oily liquid.)

Odor: Odorless, but has a choking odor when hot.

Taste: Marked acid taste. (Strong.)

Molecular Weight: 98.08 g/mole

Color: Colorless.

pH (1% soln/water): Acidic.

Boiling Point:
270°C (518°F) - 340 deg. C
Decomposes at 340 deg. C

Melting Point: -35°C (-31°F) to 10.36 deg. C (93% to 100% purity)

Critical Temperature: Not available.

Specific Gravity: 1.84 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 3.4 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in cold water.
Sulfuric is soluble in water with liberation of much heat.
Soluble in ethyl alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability:
Conditions to Avoid: Incompatible materials, excess heat, combustible material materials, organic materials, exposure to moist air or water, oxidizers, amines, bases.
Always add the acid to water, never the reverse.

Incompatibility with various substances:
Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(316).
Highly corrosive in presence of stainless steel(304).
Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Hygroscopic. Strong oxidizer. Reacts violently with water and alcohol especially when water is added to the product.
Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile+water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, , Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium aceteylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chlorate, Zinc Iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides,
Hydrogen gas is generated by the action of the acid on most metals (i.e. lead, copper, tin, zinc, aluminum, etc.).
Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds.

Special Remarks on Corrosivity:
Non-corrosive to lead and mild steel, but dillute acid attacks most metals.
Attacks many metals releasing hydrogen.
Minor corrosive effect on bronze.
No corrosion data on brass or zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 2140 mg/kg [Rat.].
Acute toxicity of the vapor (LC50): 320 mg/m3 2 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH.
May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive).
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L
Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m3 for 7 hrs.(RTECS)
Teratogenecity: neither embryotoxic, fetoxic, nor teratogenetic in mice or rabbits at inhaled doses producing some maternal toxicity

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis.
Eye: Causes severe eye irritation and burns. May cause irreversible eye injury.
Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestial tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to acute inhalation). It may also cause systemic toxicity with acidosis.
Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the repiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration).
Chronic Potential Health Effects:
Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion).
Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 49 mg/l 48 hours [bluegill/sunfish].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Sulfuric acid may be placed in sealed container or absorbed in vermiculite, dry sand, earth, or a similar material. It may also be diluted and neutralized. Be sure to consult with local or regional authorities (waste regulators) prior to any disposal. Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sulfuric acid UNNA: 1830 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Sulfuric acid
New York release reporting list: Sulfuric acid
Rhode Island RTK hazardous substances: Sulfuric acid
Pennsylvania RTK: Sulfuric acid
Minnesota: Sulfuric acid
Massachusetts RTK: Sulfuric acid
New Jersey: Sulfuric acid
California Director's List of Hazardous Substances (8 CCR 339): Sulfuric acid
Tennessee RTK: Sulfuric acid
TSCA 8(b) inventory: Sulfuric acid
SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid
SARA 313 toxic chemical notification and release reporting: Sulfuric acid
CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

DSCL (EEC):
R35- Causes severe burns.
S2- Keep out of the reach of children.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S30- Never add water to this product.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves.
Full suit.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Face shield.

Section 16: Other Information

References:
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

Other Special Considerations: Not available.

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Arlington, Virginia

hereby certifies that

CariSal Limited

has been accepted as an

Associate Member

and is entitled thereby to the privileges of membership as set forth in the Articles of Association and By-Laws.

IN WITNESS WHEREOF, WE HAVE HEREUNTO SET OUR HANDS AND THE SEAL OF THE INSTITUTE

PRESIDENT

BOARD CHAIR

March 28, 2007
DATE

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RISK ASSESSMENT MODELLING PROTOCOL

Proposed CariSal Trinidad Limited Chlor-Alkali Facility and Associated Infrastructure,

Point Lisas,

Trinidad and Tobago, West Indies

Prepared for:
CariSal Trinidad Limited

Submitted to:
Environmental Management Authority

Prepared By:
ICF International
DaCosta Gwendoline, Ltd.

October 26, 2007

Project Background

CariSal Trinidad Limited (CariSal) proposes to construct a chlor-alkali plant adjacent to the existing Point Lisas Industrial Estate for the production of calcium chloride, caustic soda, sodium hypochlorite and hydrochloric acid with high quality industrial water as a by-product. On December 22, 2006, CariSal submitted an application for a Certificate of Environmental Clearance to the Trinidad and Tobago Environmental Management Authority (EMA). The EMA has reviewed that application and has determined that there would be significant environmental impacts that could arise from the proposed activities and that the application requires an Environmental Impact Assessment (EIA) in compliance with a Terms of Reference (TOR). The final TOR identifies the need for risk assessment modelling analysis as part of the EIA. This risk assessment modelling protocol is being submitted to the EMA and will provide the basis for the risk assessment modelling conducted for the EIA.

This document summarizes the risk assessment modelling procedures that are planned for use in evaluating the potential accident scenarios for reasonably foreseeable accidents, including potential accidental releases of hazardous and flammable materials. The risk assessment methodology described in this modelling protocol will be applied to assess the frequency and potential consequences of accidents during facility operations over the proposed 20-year life span of the facility. This protocol has been developed following risk assessment methodologies used in EIA's prepared for existing and proposed facilities in the vicinity of the CariSal site, as well as recommendations provided in the TOR and the U.S. Environmental Protection Agency (EPA) Guidelines on Air Quality Models (GAQM), Appendix W to 40 US Code of Federal Regulations Part 51. Public health impacts associated with hazardous material release accident scenarios will be evaluated relative to the Trinidad and Tobago air quality permissible levels as documented in the draft Trinidad Air Rules (2005) and relative to other relevant short-term exposure guidelines. Occupational [on-site] impacts associated with accident scenarios will be evaluated with respect to occupational health and safety standards including the Trinidad and Tobago Occupational Health and Safety Act.

Project Location

The proposed Chlor-Alkali plant will occupy an approximately 11.8 hectare lot of land. Figure 1 shows the facility location in relation to existing roads and other development in the area. The site is bounded to the north by a drainage channel. The National Gas Company of Trinidad and Tobago Limited (NGC) pipeline corridor and a Trinidad and Tobago Electricity Commission (T&TEC) corridor lies to the east. On the west are the Southern Main Road and the existing Point Lisas Port Development Company (PLIPDECO) as well as the Point Lisas Industrial Estate. The North Sea Road borders the south side of the site and the Essar Steel plant is located further to the southeast.

Figure 1. Project Facility Location=Zone 3a 4a with New Site.pdf

Operational Accident Scenarios

Scenario Information

Accident scenarios for the proposed Chlor-Alkali plant were identified based on review of the Process Hazard and Environmental Risks Identification (HAZID) [Document TTK-3831-HAZIP-REV C.DOC] prepared for the proposed Chlor-Alkali plant and based on review of process flow diagrams and related information. We selected accident scenarios from the HAZID based on the estimated frequency and consequences of the scenarios. These scenarios fall into eight categories.

Information on the types and amounts of hazardous or flammable materials released and the proposed approach for the accident scenario modelling is given below for each scenario. We estimated hazardous and flammable material release rates for on-site incidents based on the incident affecting one of the two 50,000 ton per year Chlor-Alkali units. The accident scenarios to be analyzed are listed below.

1) On-site hazardous material (gaseous) release:
   a) Chlorine [indoor and outdoor] process pipe breach (Cl2 release),
   b) Intermixing of Hypochlorite with HCl (Cl2 release).

2) On-site hazardous material (liquid) release:
   a) Vessel Failure: On-site sodium hydroxide storage tank (NaOH spill),
   b) Vessel Failure: On-site hydrochloric acid storage tank (HCl spill),
   c) Vessel Failure: On-site hypochlorite storage tank (bleach spill).

3) Flammable gas release (dispersion) scenario:
   a) Hydrogen [indoor and outdoor] process pipe breach (H2 release),
   b) Hydrogen vent stack release and HCl scrubber stack release (of un-combusted H2),

4) Flammable gas release (deflagration) scenario:
   a) On-site Natural gas deflagration (CH4 release)
   b) Off-site Natural gas deflagration (CH4 release)

5) Off-site fixed facility hazardous material release:
   a) Vessel Failure: Off-site caustic shore tank breach (NaOH spill)
   b) Off-site caustic pipeline breach (NaOH spill)

6) Off-site transportation hazardous material release:
   a) Hydrochloric acid: 4,000 gallon tank truck accident on public road (HCl spill)
   b) Hypochlorite: 4,000-gallon tank truck accident on public road (bleach spill)

7) On-site Equipment Fire and Explosion Scenarios
   a) Fire Scenarios identified in HAZID
   b) Explosion Scenarios identified in HAZID

8) On-site Hazardous Materials Release Scenarios
   a) Vessel Failure Scenarios identified in HAZID
   b) Piping Failure Scenarios identified in HAZID

Figure 2 provides the plot plan for the facility showing approximate on-site accidental release / incident locations for the above-listed accident scenarios. Figure 3 shows the locations of off-site fixed facilities. Figure 4 shows potential tank truck transportation routes for hydrochloric acid and bleach product transportation from the CariSal facility.

Figure 2. On-site accidental release locations=Carisal Plant Layout Scenarios.pdf

Figure 3. Off-site accidental release locations= CariSal_2 Pipeline Location Edits.pdf

Figure 4. Transportation routes=CariSal_2 Transportation Route Edits.pdf

1 On-site hazardous material (gaseous) release

On-site gaseous hazardous materials release scenarios include potential releases of chlorine. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for gaseous release scenarios are provided in Table 1.

1.a Chlorine [indoor and outdoor] process pipe breach (Cl2 release)

Releases of chlorine gas may result from several accident scenarios, including breach of chlorine process pipe either within the cell room (indoors) or outside of the cell room (outdoors) as a result of physical damage to the process pipe. These two scenarios will be modelled separately, as the release conditions differ. A chlorine release would be detected by plant monitoring equipment and would activate the plant dry compressed air purge system and emergency plant shutdown procedures. The dry compressed air purge system would purge chlorine gas from process equipment and piping to the bleach plant, where the chlorine would be absorbed. Plant emergency shutdown would occur immediately and purging would be complete in approximately three minutes from initiation, limiting the chlorine release duration to approximately three minutes. The worst case volume of chlorine for modelling purposes contained in the breached process equipment is equivalent to a release rate of approximately 95 pounds per minute for three minutes, for a total release of 285 pounds [129 kilograms] of chlorine. [Basis: Process Mass and Energy Balance Nos. 403 / 406.] The actual volume would be less than this as once the emergency was automatically detected, the production of chlorine is stopped and the pressure in the system will decay until equal with atmospheric pressure.

Indoor Release Scenario

For the indoor release, the 285 pounds [129 kilograms] of chlorine would be released within the cell room over a three-minute period at a pressure of 3.96 psig and would be entrained in the cell room ventilation [ambient air] system and exhausted to the atmosphere. The cell room vent is located [reference map location] and the estimated exhaust gas flow rate is approximately 100,000 Nm3/hr.

Outdoor Release Scenario

For the outdoor release, the 285 pounds [129 kilograms] of chlorine would be released to the atmosphere over a three-minute period at a pressure of 3.96 psig. The release is assumed to occur as an elevated release (4 meter release height) – Based on process stream #402 of the flow diagram the more likely worst-case for off-site maximum concentration would be elevated as the relatively low pressure (1.17 psig) and low temp (87 C) and flow rate of 1,807 m3/hr would likely have the maximum concentration located on-site.

This scenario is based on the assumption that the chlorine that is purged to the bleach plant through the dry compressed air purge system is completely absorbed and that no residual chlorine is emitted to the atmosphere from this event.

1.b Intermixing of Hypochlorite with HCl (Cl2 release)

Chlorine could be released in the event of the inadvertent mixing of hydrochloric acid and hypochlorite product in a 4,000-gallon [15,140 litre] tank truck during product loading for shipment off site. Tank trucks used to transport hypochlorite and hydrochloric acid would normally be dedicated to one material or the other; a breach of procedure could result in inadvertent mixing of the two materials. The scenario would involve in the inadvertent loading of 4,000 gallons of hypochlorite product into a 4,000-gallon tank truck that already contains a 100-gallon "heel" of hydrochloric acid, or the inadvertent loading of 4,000 gallons of hydrochloric acid into a 4,000-gallon tank truck that already contains a 100-gallon "heel" of hypochlorite. The hypochlorite product contains approximately 12 percent chlorine, and either scenario would result in a release of 120 pounds [54 kilograms] of chlorine gas from the reaction of hypochlorite with the hydrochloric acid. The chlorine gas release would occur from the tank truck vent at an assumed release height of 4 meters. The tank truck would be located outdoors at the CariSal plant loading station [reference map location].

CariSal has suggested that this inadvertent mixing scenario could be prevented by fitting the hydrochloric acid and hypochlorite trucks and loading stations with unique nozzle fittings so that the loading apparatus for hypochlorite could not physically be used to load a hydrochloric acid truck because the nozzle would not fit; vice versa for the hydrochloric acid loading apparatus and hypochlorite trucks, and that CariSal would agree to install such dedicated nozzle fittings. The inadvertent mixing scenario will still be modelled in the Risk Assessment to estimate the potential consequences of an event; however, the risk assessment analysis would then assign the scenario an appropriately low probability of occurrence commensurate with the planned installation of the dedicated nozzles.

2 On-site hazardous material (liquid) release

On-site liquid hazardous materials release scenarios include potential releases of sodium hydroxide, and hydrochloric acid. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for liquid release scenarios are provided in Table 1.

2.a Vessel Failure: On-site sodium hydroxide storage tank (NaOH spill)

An accidental release of liquid NaOH could occur from vessel failure of an on-site NaOH storage tank, resulting in a maximum 20,300-gallon release from one of the on-site NaOH storage tanks. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would result in the secondary containment system being filled within a period of a few minutes, and that NaOH emissions would result from the evaporation from the secondary containment system. For this scenario it is further assumed that it takes the emergency responders one hour to respond to and fully neutralize the liquid release.

2.b Vessel Failure: On-site hydrochloric acid storage tank (HCl spill)

An accidental release of liquid HCl could occur from vessel failure of the on-site hydrochloric acid storage tank, resulting in a maximum 400,000-gallon release. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would result in the secondary containment system being filled within a period of 15 minutes, and that HCl emissions would result from the evaporation from the secondary containment system. For this scenario it is further assumed that it takes the emergency responders one hour to respond to the release incident and another hour to fully neutralize the liquid release.

2.c Vessel Failure: On-site hypochlorite storage tank (bleach spill)

An accidental release of liquid hypochlorite could occur from vessel failure of the on-site hypochlorite storage tank, resulting in a maximum 183,000-gallon release. Any such release would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel would result in the secondary containment system being filled within a period of 15 minutes, and that hypochlorite emissions would result from the evaporation from the secondary containment system. For this scenario it is further assumed that it takes the emergency responders one hour to respond to the release incident and another hour to fully neutralize the liquid release.

3 Flammable gas release (dispersion) scenario

Flammable gas release (dispersion) scenarios include potential releases of hydrogen. Potential releases of natural gas (methane) will be modelled as a deflagration scenario, not as a dispersion scenario, as described below. The estimated release height, velocity, temperature, duration, release rate, and total release of flammable gases (hydrogen) for flammable gas release scenarios are given in Table 2.

3.a Hydrogen [indoor and outdoor] process pipe breach (H2 release)

Releases of hydrogen gas could result from several accident scenarios, including breach of hydrogen process piping either within the cell room (indoors) or outside of the cell room (outdoors) as a result of physical damage to the process pipe. These two scenarios will be modelled separately, as the release conditions differ. A hydrogen release would activate the plant nitrogen gas purge system and emergency plant shutdown procedures. The nitrogen gas purge system would purge hydrogen gas from process equipment and piping to the hydrogen vent stack, where the hydrogen/nitrogen gas mixture would be exhausted to the atmosphere un-combusted. Plant emergency shutdown would occur in approximately three minutes from initiation, limiting the un-combusted hydrogen gas release duration to approximately three minutes. The volume of hydrogen contained in the breached process equipment is equivalent to a release rate of approximately three pounds of hydrogen for three minutes, for a total release of 9 pounds of hydrogen. Basis: Process Mass and Energy Balance 416.]

Indoor Release Scenario

For the indoor release, the 9 pounds of hydrogen would be released within the cell room over a three-minute period at a pressure of 4.18 psig and would be entrained in the cell room ventilation [ambient air] system and exhausted to the atmosphere. The cell room vent is located [reference map location] and the estimated exhaust gas flow rate is approximately 100,000 Nm3/hour.

Outdoor Release Scenario

For the outdoor release, the 9 pounds of hydrogen would be released to the atmosphere over a three-minute period at a pressure of 4.18 psig. The release is assumed to occur at an elevation of 4 meters release height. Modelling this scenario as an elevated level release, the modelling would assess whether the LEL for H2 would be exceeded at a potential ignition point to cause an explosion.

3.b Hydrogen vent stack release and HCl scrubber stack release (of un-combusted H2)

Under either the indoor or outdoor process pipe breach scenario, un-combusted hydrogen would also be released through the nitrogen gas purge system to the hydrogen stack. In addition to the 9 pounds of hydrogen released from the process pipe breach, and additional 15 cubic meters of hydrogen would be released from the process piping to the hydrogen stack along with 200 Nm3/hr of nitrogen purge gas. The hydrogen vent is located [reference map location] and estimated exhaust gas flow rate is 200 Nm3/hr of nitrogen over a 30-minute period. In addition the hydrogen pipelines to the HCl synthesis units would also be purged with approximately 200 Nm3/hr of nitrogen over a 30-minute period, involving an additional 15 cubic meters of hydrogen. The hydrogen stack and HCl scrubber vent releases would be modelled as simultaneous releases.

4 Flammable gas release (deflagration) scenario

4.a On-site Natural gas deflagration (CH4 release)

A catastrophic breach of the on-site natural gas line could result in a release of natural gas (methane) from approximately 40 feet of 6 inch-diameter pipe, corresponding to a volume of approximately 8 cubic feet of natural gas at a pressure of 1 psig. For this scenario it is assumed that the released gas ignites immediately upon release at the point of the release.

4.b Off-site Natural gas deflagration (CH4 release)

CariSal will be making a 6-inch minimum or 8-inch maximum tie-in to the existing NGC (National Gas Company) 24-inch Residue Gas Header to supply natural gas to the CariSal site via a metering station on the CariSal site. The line length from the NGC 24-inch pipeline to the metering station on the CariSal site is anticipated to be approximately 20 meters.

In the event of a line leak from the 6-inch tie-in, the leak would be detected by gas sensors as well as pressure and volume sensors that will close the emergency shut down valves, thereby reducing the amount of gas leaking to the environment. The NGC's 24-inch header is similarly

protected by pressure sensors and emergency shut down valves. The residue gas pressure is approximately 340 to 360 psig. A release of the entire volume of natural gas pipeline between the shut down valves at the Residue Gas Header and the CariSal onsite metering station would involve 0.65 cubic meters of natural gas at release pressure, equivalent to 16.6 standard cubic meters of natural gas at standard atmospheric pressure.

For this scenario it is assumed that the released gas ignites immediately upon release at the point of the release.

5 Off-site fixed facility hazardous material release

Off-site fixed facilities include the caustic pipeline and caustic shore tank. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for off-site fixed facility accident scenarios are given in Table 1.

5.a Vessel Failure: Off-site caustic shore tank breach (NaOH spill)

An accidental release of liquid NaOH could occur from failure of the shore tank vessel resulting in a 2.5 million gallon release. Any release from the shore tank would be contained in the secondary containment system for the vessel. For this scenario it is assumed that a catastrophic failure of the vessel results in the secondary containment system being filled over a one-hour period and that NaOH emissions would result from evaporation from the secondary containment system. For this scenario it is further assumed that it takes the emergency responders one hour to respond to the release incident and another hour to fully neutralize the liquid release.

5.b Off-site caustic pipeline breach (NaOH spill)

An accidental release of liquid NaOH could occur from physical damage to the caustic pipeline causing a pipeline breach. The caustic pipeline is equipped with pressure sensors and automatic shutoff valves at the CariSal facility and at the shore tank location. A decrease in pipeline pressure resulting from a pipeline breach would be detected by the pressure sensors and cause the shutoff valves to activate, isolating the pipeline from both the CariSal facility process piping and from the shore tank. Therefore only the NaOH in the pipeline at the time of a pipeline breach could potentially be released in the event of a pipeline breach. A pipeline breach could result in a release of 50 percent of the pipeline volume between the shutoff valve at the CariSal facility and shutoff valve at the shore tank location. The caustic pipeline is six inches .154 meters in diameter and approximately two kilometres 2000 meters in length. The pipeline breach scenario could result in an estimated release volume of 9,640 gallons, based on the pipeline volume, of liquid NaOH. The pipeline is assumed to not have any secondary containment system, and therefore the release would be modelled as a ground-level release (1 meter release height.) For this scenario it is assumed that the NaOH release occurs over a paved area [e.g., a roadway] and that the liquid release remains in the paved area until neutralized by emergency responders. It is further assumed that it takes emergency responders one hour to respond to the incident and another hour to fully neutralize the release.

6 Off-site transportation hazardous material release

6.a Hydrochloric acid: 4,000 gallon tank truck accident on public road (HCl spill)

Hydrochloric acid would be transported to local customers using 4,000-gallon tank trucks travelling on public roads. An accidental release could result from an off-site transportation accident, potentially involving another vehicle. Potential tank truck transportation routes from the CariSal facility to customer locations are shown in Figure 4 [above, to be developed.] A release resulting from a transportation accident would be assumed to involve the entire 4,000-gallon volume of the tank truck and would be assumed to be uncontained. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for off-site transportation accident scenarios are given in Table 1.

For this scenario it is assumed that the HCl release occurs over a paved area [e.g., a roadway] and that the liquid release remains in the paved area until neutralized by emergency responders. It is further assumed that it takes emergency responders one hour to respond to the incident and another hour to fully neutralize the release.

6.b Hypochlorite: 4,000-gallon tank truck accident on public road (bleach spill)

Hypochlorite (bleach) would also be transported to local customers using 4,000-gallon tank trucks travelling on public roads. As in Scenario 6a above, an accidental release could result from an off-site transportation accident, potentially involving another vehicle. Potential tank truck transportation routes from the CariSal facility to customer locations are shown in Figure 4 [above, to be developed.] A release resulting from a transportation accident would be assumed to involve the entire 4,000-gallon volume of the tank truck and would be assumed to be uncontained. The estimated release height, velocity, temperature, duration, release rate, and total release of hazardous materials for off-site transportation accident scenarios are given in Table 1.

As with Scenario 6a above, it is assumed that the hypochlorite release occurs over a paved area [e.g., a roadway] and that the liquid release remains in the paved area until neutralized by emergency responders. It is further assumed that it takes emergency responders one hour to respond to the incident and another hour to fully neutralize the release.

7 On-site Equipment fire and Explosion scenarios

On-site equipment fire and explosion scenarios include scenarios identified in the HAZID, such as a transformer/rectifier fire, that could result in potential on-site consequences to employees, contractors, and visitors, but are not anticipated to result in off-site consequences to the public. Scenarios having the potential for off-site consequences to the public and for which quantitative modelling will be conducted are not included in the On-site Equipment Fire and Explosion Scenario category, but are described above.

8 On-site Hazardous Materials Release Scenarios

On-site hazardous materials release scenarios include scenarios identified in the HAZID, such as process pipe leaks, that could result in potential on-site consequences to employees, contractors, and visitors, but are not anticipated to result in off-site consequences to the public. Scenarios having the potential for off-site consequences to the public and for which quantitative modelling will be conducted are not included in the On-site Hazardous Materials Release Scenario category, but are described above.

Table 1. Accident Scenario Information – On-site Hazardous Materials Release and Off-site Fixed Facility and Transportation Scenarios									
Description **Accidental Release Scenario**	**Release height** **(Metres)**	**Release temp** **(Deg C)**	**(Release velocity)**	**Release Duration** **(Min.)**	**Pressure** **(Psia)**	**Total Release** **(Gallons)**	**(Metric tons)**	**Release rate (kg/min) (Hazardous Material)**	
On-site Hazardous Material (Gaseous Cl2 release)									
Chlorine [indoor] process pipe breach	1	Ambient	100,000 Nm3/hr	3	Ambient	--	0.13	43.1	Cl2
Chlorine [outdoor] process pipe breach	4	40		3	18.66	--	0.13	43.1	Cl2
Intermixing of Hypochlorite with HCl	4	Ambient		3	Ambient	--	0.054	18.1	Cl2
On-site Hazardous Material (Liquid)									
Vessel Failure: On-site NaOH storage tank	1	Ambient		60	Ambient	20,300			NaOH
Vessel Failure: On-site HCl storage tank	1	Ambient		120	Ambient	400,000			HCl
Vessel Failure: On-site hypochlorite tank	1	Ambient		120	Ambient	183,000			Hypo
Off-site Fixed Facility Scenarios									
Off-site caustic pipeline breach	1	Ambient		120	Ambient	9,640			NaOH
Off-site caustic shore tank breach	1	Ambient		180	Ambient	2.5 mil			NaOH
Off-site Transportation Scenarios									
Hydrochloric acid: tank truck accident	1	Ambient		120	Ambient	4,000			HCl
Bleach (product): tank truck accident	1	Ambient		120	Ambient	4,000			Hypo

Table 2. Accident Scenario Information – Flammable Gas Release and Fire and Explosion Scenarios

Description Accidental Release Scenario	Release height (Metres)	Release temp (Deg C)	Release velocity	Release pressure (Psia)	Release duration (Min.)	Total Release H2 / CH4 (Cubic meters)	Flammable Gas Released
Flammable Gas Release Scenarios							
Hydrogen [indoor] process pipe breach	1	Ambient	100,000 Nm3/hr ambient air	Ambient	3	0.004	H2
Hydrogen [outdoor] process pipe breach	4	87		18.88	3	0.004	H2
Hydrogen stack release (un-combusted H2)	10	87	200 Nm3/hr N2 + 15 Nm3 H2	Ambient	30	15	H2
HCl Scrubber Outlet (un-combusted H2)	29	40	200 Nm3/hr N2 + 15 Nm3 H2	Ambient	30	15	H2
Flammable Gas Deflagration Scenarios							
Onsite Natural gas deflagration (CH4 release)	1	Ambient		15.7	Inst.	0.222	CH4
Offsite Natural gas deflagration (CH4 release)	1	Ambient		365	Inst.	16.6	CH4

Plant Emergency Shutdown Systems

For the purposes of the risk assessment, storage tank secondary containment systems are assumed to function effectively to contain accidental releases of liquid hazardous materials from on-site storage tanks and the off-site caustic shore tank. The off-site caustic pipeline is assumed not to have any spill containment system. The Chlor-Alkali plant emergency shutdown system and automatic shutoff systems for the CariSal plant natural gas system and caustic pipeline are assumed to operate effectively, and the plant nitrogen purge and dry compressed air systems are assumed to function effectively to evacuate hydrogen and chlorine from process lines to the hydrogen stack and bleach plant, respectively, in the event of emergency plant shutdown.

Construction Accident Scenarios

Construction of the Chlor Alkali facility will occur over a ten-month time period. There is the potential for spills of hazardous materials (e.g., solvents) and the potential for fires involving flammable materials (e.g., solvents, transportation and construction equipment fuel.) Potential fire scenarios for the construction phase of the project are based on the amount of flammable material anticipated to be stored on site at any one time. Potential hazardous materials release scenarios will be based on the amount of hazardous materials anticipated to be stored on site at any one time. No accidental release scenarios involving chlorine, caustic, hydrochloric acid, or hypochlorite are anticipated for the construction phase of the project.

Start-Up Accident Scenarios

Frequency and consequences of accident scenarios identified in the HAZID would not differ during initial start up or plant restart from normal plant operation. Therefore no additional analyses of accident scenarios for plant start up or plant restart have been conducted for the risk assessment.

Alternative Plant Configuration Accident Scenarios

Frequency and consequences of accident scenarios identified in the HAZID would not be affected by alternative plant configurations, e.g., on-site reverse osmosis plant, on-site cogeneration plant. Therefore no additional analyses of accident scenarios for alternative plant configurations have been conducted for the risk assessment.

Regulatory Review Criteria

Standards and Criteria Levels

The proposed chlor-alkali facility will be a potential source of accidental releases of hydrochloride (HCl), chlorine (Cl2) sodium hydroxide (NaOH), and sodium hypochlorite. Table 3 shows the modelling averaging periods and levels of ambient air concentrations to which the

accidental release modelling results will be compared. For the purposes of the accidental release modelling and risk assessment, model averaging periods will be based short-term (hourly) emission rates for each discrete accidental release event. Table 3 summarizes the applicable Trinidad Permissible Levels and other relevant exposure guidelines.

Table 3: Applicable Trinidad Permissible Levels and Related Criteria for Hazardous Materials Releases

Hazardous Material	Averaging Period	Permissible Level (ug/m3)	Basis for Permissible Level
Hydrogen Chloride (HCl)	30-minute	100	Trinidad Air Rules 2005
Hydrogen Chloride (HCl)	1-hour	2,100	California EPA Acute REL
Chlorine (Cl2)	30-minute	300	Trinidad Air Rules 2005
Chlorine (Cl2)	1-hour	210	California EPA Acute REL
Sodium Hydroxide (NaOH)	1-hour	8	California EPA Acute REL
Sodium Hypochlorite (bleach)	15-minute	600	TEEL-0

Risk Assessment Analysis

Accident Scenario Modelling

1 On-site Hazardous Materials (Gaseous) Release Scenarios

Releases of chlorine gas may result from several types of scenarios as described above. The two candidate models that are ideally suited to modelling this type of release are the Areal Locations of Hazardous Atmospheres (ALOHA) model and the US Department of Energy sponsored model (SLAB). Both are designed to predict how a hazardous gas (both neutral and dense) cloud disperses after an accidental release and contain chemical and material property information. Differences between the two models for this situation are tied to the more comprehensive physical treatment with SLAB which includes such effects as the buoyancy of a gas that has been heated prior to the release, plume meander and entrainment rates for thermal convection due to ground heating and cloud lift off (lofting).

> **ALOHA** is designed as an emergency response model to predict behaviour during an accidental chemical release. ALOHA can predict rates of chemical release from leaking tanks and evaporating puddles as well as the dispersion of both neutrally-buoyant and heavier-than-air gases (chlorine). Output includes concentration contour plots as well as concentration at specified locations.

SLAB is a mathematical model that simulates dense and neutrally buoyant releases for both continuous or instantaneous, liquid or gas, elevated or surface, releases from point or area sources. Finite duration release is initially described as a steady-state plume once the source is shut-off the cloud is treated as a transient puff mode. Output consists of concentration information and concentration at a specified location as well as the maximum centreline concentration. The model has undergone a comprehensive model evaluation as reported by Hanna et al. (1993)1.

In general we propose to first use the ALOHA model as an initial estimate of potential maximum exposure. If modelling results do not show levels well below the short-term exposure criteria we will consider using the more sophisticated SLAB model as the model includes more extensive treatment of physical phenomena as described above. All chlorine releases will be modelled as dense gas releases. Modelled concentrations will be compared to short-term exposure criteria as identified in Table 3.

2 On-site Hazardous Material (Liquid) Releases

Two accident scenarios are considered under this category:

- Accidental release of liquid NaOH from vessel failure of the on-site NaOH storage tank, resulting in a 20,300-gallon release;
- Accidental release of liquid HCl from vessel failure of the on-site hydrochloric acid storage tank, resulting in a 400,000-gallon release

Accidental releases of liquids would be modelled using the ALOHA and/or SLAB model depending upon the specifics of the release. Caustic (NaOH) and hydrochloric acid will be modelled either as aerosol release or as evaporative release based on their vapour pressure and details of the release type (liquid release into a containment system or directly to the atmosphere.) Modelled concentrations will be compared to short-term exposure criteria as identified in Table 3.

3 Flammable Gas Release (Dispersion) Scenarios

Dispersion of un-ignited flammable material (hydrogen) to potential ignition points will be modelled using USEPA's SCREEN3 Gaussian atmospheric dispersion model and reported for the worst-case meteorological conditions. Individual risk will be evaluated based on the potential for dispersion of un-ignited flammable material to reach a receptor/ignition point at greater than lower explosive limit concentration, the vulnerability of persons at the receptor location to heat or blast, and the frequency that receptor locations would be occupied.

Release of un-combusted hydrogen from the hydrogen vent stack and HCl scrubber stack resulting from an accident scenario / emergency shutdown condition will be modelled using a

[1] Hanna, S.R., Chang, J.C., and Strimaitis, D.G. (1993) Hazardous Gas Model Evaluation with Field Observations, *Atm Env,* Vol 27A, 15, 2265-2285.

Gaussian dispersion model to assess whether a hydrogen plume at greater than lower explosive limit could contact an off-site ignition source.

4 Flammable Gas Release (deflagration) scenario

Accidental releases of natural gas [methane] from an on-site or off-site pipeline breach will be modelled as a vapour cloud explosion (deflagration) scenario assuming immediate ignition and not as flammable gas dispersion scenario assuming delayed ignition. Individual risk associated with fire and explosion scenarios will be evaluated based on the potential for dispersion of un-ignited flammable material to a receptor/ignition point at greater than lower explosive limit concentration, the vulnerability of persons at the receptor location to heat or blast, and the frequency that receptor locations would be occupied.

5 Off-site Fixed Facility Hazardous Material Release

Off-site fixed facilities include the off-site caustic pipeline and caustic shore tank. Two hazardous materials release scenarios will be assessed for the off-site fixed facilities: release scenarios:

- An off-site caustic pipeline breach (NaOH liquid spill)
- An off-site caustic shore tank breach (NaOH liquid spill)

Accidental releases of the NaOH (caustic) will again be modelled using the ALOHA model and/or the SLAB model depending upon the details of the release with the caustic modelled either as an aerosol release or as evaporative releases depending upon the vapour pressure and the whether the release is into a containment system or directly to the atmosphere. Modelled concentrations will be compared to short-term exposure criteria as identified in Table 3.

6 Off-site Transportation Hazardous Material Release

Hydrochloric acid and hypochlorite (bleach) will be transported from the CariSal plant to local customers by tank truck. Two scenarios will be assessed for off-site transportation releases of hazardous materials:

- A 4,000-gallon tank truck accident on public road hauling hydrochloric acid
- A 4,000-gallon tank truck accident on public road hauling bleach (hypochlorite)

Accidental releases of hydrochloric acid and hypochlorite from transportation accidents will be modelled using the ALOHA model and/or SLAB model. Hydrochloric acid and hypochlorite liquid releases will be modelled either as aerosol releases or as evaporative releases [based on the hazardous material vapour pressure] depending upon the whether the liquid pools or vaporizes to the atmosphere. Modelled concentrations will be compared to short-term exposure criteria as identified in Table 3.

7 On-site Equipment Fire and Explosion Scenarios

On-site equipment fire and explosion scenarios other than the scenarios described above are not anticipated to have potential off-site consequences to the public. Therefore no quantitative modelling is anticipated for these scenarios. The frequency and consequences of these scenarios are evaluated in the Hazard Identification (HAZID). The potential consequences of on-site equipment fire and explosion scenarios to on-site employees, contractors, and visitors will be evaluated with respect to occupational health and safety standards, including the Trinidad and Tobago Occupational Safety and Health Act, and the anticipated frequency and consequences of these scenarios as identified in the HAZID will be incorporated into the risk ranking along with the scenarios for which quantitative modelling is conducted.

8 On-site Hazardous Materials Release Scenarios

On-site hazardous materials release scenarios (e.g., process pipe leaks) other than the scenarios described above are not anticipated to have potential off-site consequences to the public. Therefore no quantitative modelling is anticipated for these scenarios. The frequency and consequences of these scenarios are evaluated in the Hazard Identification (HAZID). The potential consequences of on-site hazardous materials release scenarios to on-site employees, contractors, and visitors will be evaluated with respect to occupational health and safety standards, including the Trinidad and Tobago Occupational Safety and Health Act, and the anticipated frequency and consequences of these scenarios as identified in the HAZID will be incorporated into the risk ranking along with the scenarios for which quantitative modelling is conducted.

Meteorological Data

The methodology for obtaining and applying the meteorological data that will be applied for the risk assessment modelling is described in the Air Dispersion Modelling Protocol. A specific wind speed and direction will be assumed for each accident scenario based on evaluation of the meteorological data. Worst-case meteorological conditions (Stability Class F and 1.5 meter per second wind speed) may be assumed for modelling accidental releases of hazardous materials and fire and explosion scenarios.

Ambient Conditions

CariSal is conducting on-site ambient monitoring for HCl and Cl2 for a one-month period this year. This dataset will serve to establish the current maximum ambient air quality concentrations levels at the proposed site location for HCl and Cl2. Background concentrations of hypochlorite as well as NaOH will be assumed zero since the principal source for NaOH is from it's manufacturing and the proposed facility would be the principal source in Trinidad for sodium hydroxide other sources include it's use in the manufacture of chemicals, rayon, and petroleum products, but releases to the atmosphere from those sources should be very small. In any event background concentrations from any of these species should be small relative to the levels emitted during the possible accident scenarios.

Population Data

Population data for occupied residential and commercial structures, including existing and proposed industrial sites in the vicinity of the proposed CariSal plant, will be applied to the accidental release modelling analysis to identify potential receptors in the vicinity of the CariSal plant to estimate individual and societal risk. Population data will also be applied to potential transportation routes for off-site tank truck transport of hydrochloric acid and hypochlorite, and to the vicinity of the off-site fixed facilities (i.e., the caustic pipeline and shore tank) to estimate individual and societal risk. Population density data will be obtained from the *Socioeconomic Analysis of Communities Near the Proposed CariSal Project Report* prepared by HHB, and from existing risk assessment studies, including the QRA for the 36-inch natural gas pipeline.

Receptors

For on-site hazardous material release scenarios and fire and explosion scenarios, potential receptor locations will be identified in relation to the distance from the facility boundary. Potential receptor locations will include inhabited or occupied buildings and structures including residential properties and commercial properties, and also other off-site areas accessible to the public. The population density in the vicinity of the facility boundary will also be identified for each accident scenario to assess the number of people potentially affected by each scenario.

For hazardous material releases from off-site fixed facilities and transportation accidents, receptors will be identified based on a location-specific analysis.

For off-site fixed facilities [the caustic pipeline and caustic shore tank] receptors will be identified as follows:

- For the caustic pipeline the population density along the proposed pipeline route will be assessed and the pipeline breach will be assumed to occur in the most densely populated area of the pipeline route;
- Specific receptors [buildings and structures] will be identified for this location;
- For the caustic shore tank, specific receptors [buildings and structures] will be identified based on assessment of publicly accessible areas in the vicinity of the shore tank.

For off-site transportation accidents potential transportation routes will be assessed; the transportation accident will be assumed to occur in the most densely populated area along the route. Specific receptors [buildings and structures] will be identified for this location.

Impact Assessment

Individual and Societal Risk

Individual risk will be estimated for each accident scenario based on the modelled impacts and locations of specific receptors. Societal risk will be estimated for each accident scenario by

ranking the scenarios based on risk probability as function of individual risk, with respect to population groups (i.e., the individual risk associated with the accident scenario multiplied by the number of people exposed represent the affected population.) The affected population and frequency of occurrence for each accident scenario will be evaluated based on the EMA Societal Risk Guidelines (Table 4) and depicted in the form of an F-n diagram.

Table 4: EMA Societal Risk Guidelines

Number of Affected Persons	Incident Frequency
10	1 x 10-4
100	1 x 10-6
1,000	1 x 10-8
10,000	1 x 10-10

Cumulative Impact Assessment

The potential exists for accidents at existing or proposed facilities in the vicinity of the Chlor-Alkali plant (e.g., Essar, Westlake, Natural Gas Company) to affect Chlor-Alkali plant operations. A review of accident scenarios for nearby existing and proposed facilities did not identify any scenarios that could precipitate an event (e.g., hazardous materials release) at the Chlor-Alkali plant. Therefore, no additional analyses of the potential cumulative effects of accident occurrences at existing or proposed facilities have been conducted for the risk assessment.

Presentation of Results

The results of the risk assessment modelling analyses will be presented as follows:

- For on-site liquid and gaseous hazardous materials release scenarios, a summary of the results will be presented in tabular format relative to the appropriate permissible level. Spatial plots will be developed for locations outside the facility boundaries. These will show consequence radii impacts for the hazardous materials releases that demonstrate highest impacts relative to the air quality permissible levels.

- For off-site fixed facility and transportation release scenarios, a summary of the results will be presented in tabular format relative to the appropriate permissible level. Spatial plots will be developed for specific receptors in the vicinity of each fixed facility location. These will show consequence radii impacts for the hazardous

materials releases that demonstrate highest impacts relative to the air quality permissible levels.

- Estimated event frequencies for each accident scenario will be summarized in tabular format.

- The population density within the consequence radii for each accident scenario will be graphically illustrated and the number of persons potentially affected by each accident scenario will be estimated and summarized in tabular format.

- Modelling files as used for the risk assessment analysis will be provided in electronic format for the EMA's review.

- A detailed discussion of the results will be included in the Environmental Impact Assessment document, to which the Risk Assessment will be an Attachment.

TRAFFIC COUNT DATA REPORT FOR SOUTHERN MAIN ROAD POINT LISAS, AUGUST 2007

TRAFFIC COUNT DATA REPORT

FOR

SOUTHERN MAIN ROAD POINT LISAS

FOR

CARASIL

AUGUST 2007

Trintoplan Consultants Limited
Orange Grove Road, Tacarigua
P.O. Box 1262, Port of Spain.
TRINIDAD & TOBAGO W.I.

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E-Mail – ttplan@tstt.net.tt

August 24, 2007 File: 4143

Carasil
3 Pelham Street
PORT OF SPAIN

Attention: Mr. Roger Moore

Dear Sir,

RE: TRAFFIC COUNTS FOR THE POINT LISAS AREA ON THE SOUTHERN MAIN ROAD

We are pleased to submit four (4) copies of the automated traffic count report for the above captioned project.

We trust that the contents of this report meets with your requirements and we are here at your convenience should you require any further discussions or clarifications.

Yours respectfully,

Saffraz A Muhammad

Saffraz A. Muhammad
Civil Engineer, Geotechnical Department

TRAFFIC COUNT DATA REPORT

FOR

SOUTHERN MAIN ROAD POINT LISAS

FOR

CARASIL

AUGUST 2007

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APPENDIX D	-	DAILY CLASSES (NORTH BOUND LANE)
APPENDIX E	-	DAILY CLASSES (SOUTH BOUND LANE)
APPENDIX F	-	CLASS SPEED MATRIX (NORTH BOUND LANE)
APPENDIX G	-	CLASS SPEED MATRIX (SOUTH BOUND LANE)

1.0 INTRODUCTION

Trintoplan Consultants Limited (TCL) was retained by CaraSil to undertake a traffic count on the Southern Main Road. The traffic count exercise was undertaken along the Southern Main Road, Point Lisas approximately 100m north of the entrance to YARA.

2.0 METHODOLOGY

The traffic count was carried out between the dates of Monday 12, August 2007 to Tuesday 19, August 2007. Automatic counts were carried out using our Metro Count Roadside Units, Model 5600. Counts were carried out at the locations specified by ECL.

2.1 Automatic Counts

The Metro Count Vehicle Classifier System combines robust hardware and sophisticated computer software to execute the counts and the vehicle classification.

The automatic counter is made of two main components. These are a roadside unit, which has the electronic circuitry for storage of digital data; and two pneumatic tubes that act as detectors for traffic. The pneumatic tubes are installed across the road with a known separation. When the vehicle's first axle hits the tubes, the classifier measures the traversal time to calculate its speed, and then uses subsequent hits to obtain the axle separation. The classifier uses the number of axles and axle separations to derive vehicle classes from a classification scheme. The order of tube hits gives the direction of travel. To distinguish vehicles, the classifier assumes a minimum inter-vehicle time.

The roadside unit does not process traffic data during the counts, rather it all axle events in a compressed format. The actual task of classifying the vehicles is performed later when the information is downloaded to a personal computer.

3.0 TRAFFIC COUNT DATA

The Classification Scheme is included as Appendix A and the traffic count data is included in Appendices B to G.

4.0 CLOSURE

We trust that the content of this report meets with your requirements and should you require further discussion or clarification, please do not hesitate to contact us.

Yours respectfully,

Saffraz A Muhammad

Saffraz A. Muhammad
Civil Engineer, Geotechnical Department
Attach:

LIST OF APPENDICES

APPENDIX A	-	CLASSIFICATION SCHEME
APPENDIX B	-	VEHICLE COUNTS (NORTH BOUND LANE)
APPENDIX C	-	VEHICLE COUNTS (SOUTH BOUND LANE)
APPENDIX D	-	DAILY CLASSES (NORTH BOUND LANE)
APPENDIX E	-	DAILY CLASSES (SOUTH BOUND LANE)
APPENDIX F	-	CLASS SPEED MATRIX (NORTH BOUND LANE)
APPENDIX G	-	CLASS SPEED MATRIX (SOUTH BOUND LANE)

APPENDIX A

CLASSIFICATION SCHEME

Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FHWA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	< 6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	< 10.0	10.0 - 18.0			
	car + 2 axle trailer	4	< 10.0		< 3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 - 15.0		< 3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			< 3.5	
4	bus	2	> 20.0				
	bus	3	> 19.0				
5	single unit truck - dual rear axle	2	14.9 - 20.0			< 3.5	
6	3 axle truck	3		< 18.0			
7	4 axle truck	4					
8	2S1	3		> 18.0			
	2S2	4		> 5.0	> 3.5		
	3S1	4		< 5.0	> 10.0		
9	3S2	5		< 6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		> 6.0			
12	3S1-2	6					> 10.0
13	truck	7 or more					
Ungrouped Classes							
14	unclassifiable vehicle						
0	unclassifiable axle event						

APPENDIX B

VEHICLE COUNTS
(NORTH BOUND)

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-67 -- English (ENT)

Datasets:

Site:	**[Point Lisas SMR] Southern Main Road**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Point Lisas SMR23Aug2007.EC0 (Plus)
Identifier:	N3852KH0 MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 46074 / 94298 (48.86%)

* Thursday, 09 August 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0

* Friday, 10 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Saturday, 11 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Sunday, 12 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Monday, 13 August 2007 - Total=4233, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	342	408	408	382	371	384	483	373	330	240	176	149	118	69	
0	0	0	0	0	0	0	0	0	0	56	82	129	94	78	85	127	93	87	81	41	53	21	19	9
0	0	0	0	0	0	0	0	0	0	80	85	89	97	90	126	124	87	77	57	43	28	37	25	11
0	0	0	0	0	0	0	0	0	0	103	110	95	98	111	79	127	102	81	53	43	41	32	17	9
0	0	0	0	0	0	0	0	0	0	103	131	95	93	92	94	105	91	85	49	49	27	28	8	7

AM Peak 1130 - 1230 (459), AM PHF=0.88 PM Peak 1600 - 1700 (483), PM PHF=0.95

* Tuesday, 14 August 2007 - Total=6905, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
36	19	6	6	29	153	664	671	473	407	422	438	420	377	375	393	483	366	371	238	203	159	124	72	
9	4	4	0	1	19	114	181	176	107	92	101	136	90	95	107	130	84	91	65	59	49	27	29	10
11	3	2	1	7	26	156	176	92	93	104	97	99	105	98	81	137	97	104	66	48	40	33	15	9
9	8	0	2	7	44	181	169	115	101	125	110	89	96	94	99	116	87	94	41	53	35	32	13	5
7	4	0	3	14	64	213	145	90	106	101	130	96	86	88	106	100	98	82	66	43	35	32	15	1

AM Peak 0630 - 0730 (751), AM PHF=0.88 PM Peak 1545 - 1645 (489), PM PHF=0.89

* Wednesday, 15 August 2007 - Total=7124, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
25	18	14	10	33	186	710	663	505	394	426	442	398	371	471	391	487	395	355	268	204	136	151	71	
10	6	2	3	3	26	111	191	155	100	110	119	96	86	123	94	127	120	96	83	55	32	39	25	11
9	2	5	2	5	28	179	182	131	91	103	97	106	98	124	96	126	76	87	75	57	33	42	20	12
5	5	3	4	11	45	202	165	112	99	125	106	96	104	113	92	120	86	98	63	42	33	46	14	10
1	5	4	1	14	87	218	125	107	104	88	120	100	83	111	109	114	113	74	47	50	38	24	12	7

AM Peak 0630 - 0730 (793), AM PHF=0.91 PM Peak 1600 - 1700 (487), PM PHF=0.96

* Thursday, 16 August 2007 - Total=7065, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
40	24	14	18	32	160	681	708	478	420	420	434	434	413	385	377	482	383	346	252	201	152	157	54	
11	6	5	7	4	20	127	205	138	115	92	93	124	112	98	80	132	121	95	61	55	45	40	16	17
12	4	2	3	4	22	163	181	131	110	111	108	95	102	90	87	137	75	89	61	62	33	35	14	7
10	7	2	3	10	46	200	188	98	100	108	121	120	90	110	103	118	109	83	77	40	39	49	13	8
7	7	5	5	14	72	191	134	111	95	109	112	95	109	87	107	95	78	79	53	44	35	33	11	8

AM Peak 0630 - 0730 (777), AM PHF=0.95 PM Peak 1545 - 1645 (494), PM PHF=0.90

* Friday, 17 August 2007 - Total=7245, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
40	25	15	12	29	169	643	685	451	378	411	455	409	471	444	457	495	360	317	279	210	185	181	124	
17	12	4	2	2	20	112	204	146	88	102	92	131	107	110	98	141	101	65	94	53	53	51	40	28
7	6	7	1	8	19	160	178	97	108	108	104	101	104	107	114	130	78	92	72	58	49	44	29	21
8	5	2	3	5	50	202	157	76	85	97	130	71	120	120	138	105	86	88	61	53	38	47	30	22
8	2	2	6	14	80	169	146	132	97	104	129	106	140	107	107	119	95	72	52	46	45	39	25	17

AM Peak 0630 - 0730 (753), AM PHF=0.92 PM Peak 1530 - 1630 (516), PM PHF=0.91

* Saturday, 18 August 2007 - Total=5149, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
88	57	37	27	33	110	409	349	296	288	311	319	270	255	293	301	227	277	287	236	195	184	174	127	
28	17	13	9	8	11	66	78	74	72	77	72	75	64	68	75	61	71	65	59	46	49	41	37	23
21	17	9	6	10	12	96	88	67	80	71	96	60	49	82	71	48	58	78	55	57	47	49	26	20
22	12	8	6	7	33	108	87	69	70	77	75	60	66	80	69	61	72	70	63	39	40	39	29	20
17	11	7	6	8	54	139	96	86	66	86	75	75	76	63	86	57	76	74	59	53	48	45	35	16

AM Peak 0615 - 0715 (421), AM PHF=0.76 PM Peak 1345 - 1445 (306), PM PHF=0.93

* Sunday, 19 August 2007 - Total=3888, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
79	63	47	35	38	66	257	199	207	177	197	175	175	183	230	196	212	258	277	212	205	172	157	71	
23	17	17	13	8	15	42	62	55	38	57	47	39	42	67	46	53	53	56	54	56	42	36	23	10
20	17	8	9	10	9	52	46	53	46	40	36	43	58	52	36	48	67	78	53	58	47	48	20	9
20	12	8	6	8	15	79	55	51	48	57	51	43	43	62	59	55	66	78	52	42	38	42	16	10
16	17	14	7	12	27	84	36	48	45	43	41	50	40	49	55	56	72	65	53	49	45	31	12	8

AM Peak 0615 - 0715 (277), AM PHF=0.82 PM Peak 1745 - 1845 (284), PM PHF=0.91

* Monday, 20 August 2007 - Total=4465 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
37	21	20	14	27	156	706	625	421	437	368	455	297	327	420	-	-	-	-	-	-	-	-	-	
10	8	7	6	5	17	111	145	143	112	86	114	94	70	114	71	-	-	-	-	-	-	-	-	-
9	5	3	5	2	14	190	173	95	89	104	108	91	74	100	63	-	-	-	-	-	-	-	-	-
10	4	7	1	8	50	186	158	93	133	81	131	49	63	105	-	-	-	-	-	-	-	-	-	-
8	4	3	2	12	75	219	149	90	103	97	102	63	120	101	-	-	-	-	-	-	-	-	-	-

AM Peak 0615 - 0715 (740), AM PHF=0.84

APPENDIX C

VEHICLE COUNTS
(SOUTH BOUND)

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-70 -- English (ENT)

Datasets:

Site:	**[Point Lisas SMR] Southern Main Road**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Point Lisas SMR23Aug2007.EC0 (Plus)
Identifier:	N3852KH0 MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48133 / 94298 (51.04%)

* Thursday, 09 August 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0

* Friday, 10 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Saturday, 11 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Sunday, 12 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Monday, 13 August 2007 - Total=5028, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	359	411	450	408	406	533	595	457	389	362	254	163	115	126	
0	0	0	0	0	0	0	0	0	0	68	103	108	114	101	125	154	147	99	86	74	46	37	45	9
0	0	0	0	0	0	0	0	0	0	98	97	105	111	107	130	142	101	106	100	68	36	33	34	8
0	0	0	0	0	0	0	0	0	0	112	93	118	92	86	155	180	116	101	99	70	39	23	23	12
0	0	0	0	0	0	0	0	0	0	101	118	119	91	112	123	119	93	83	77	42	42	22	24	5

AM Peak 1145 - 1245 (449), AM PHF=0.95 PM Peak 1545 - 1645 (599), PM PHF=0.83

* Tuesday, 14 August 2007 - Total=7148, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
34	19	16	10	37	115	412	614	460	409	407	434	461	407	416	517	563	414	393	371	230	178	112	119	
9	6	5	1	7	12	82	148	120	102	110	106	116	88	92	121	149	135	112	116	59	54	35	53	17
8	7	5	3	9	22	90	165	108	99	91	102	103	103	130	144	146	99	90	106	58	45	26	34	9
12	5	2	4	7	35	118	161	105	107	109	102	127	101	100	142	128	89	91	78	64	40	27	17	10
5	1	4	2	14	46	142	140	127	101	97	124	115	115	94	110	140	91	100	71	49	39	24	15	11

AM Peak 0645 - 0745 (616), AM PHF=0.93 PM Peak 1600 - 1700 (563), PM PHF=0.94

* Wednesday, 15 August 2007 - Total=7477, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
47	21	15	21	31	130	408	625	489	404	424	422	452	454	447	570	604	465	387	390	242	169	125	135	
17	8	1	6	5	22	74	169	156	88	95	108	111	114	99	108	166	140	102	105	75	35	36	48	19
9	6	3	5	3	22	74	164	126	102	104	103	107	95	123	155	153	108	93	119	59	50	27	42	9
10	3	6	4	10	31	130	144	108	112	108	104	131	135	107	146	166	105	89	90	49	41	31	28	13
11	4	5	6	13	55	130	148	99	102	117	107	103	110	118	161	119	112	103	76	59	43	31	17	10

AM Peak 0700 - 0800 (625), AM PHF=0.92 PM Peak 1545 - 1645 (646), PM PHF=0.97

* Thursday, 16 August 2007 - Total=7340, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
51	22	7	13	29	109	414	636	445	384	442	420	472	464	411	589	561	452	370	353	244	172	131	149	
19	6	0	3	5	17	69	147	121	111	109	98	131	128	95	148	128	124	83	108	62	46	41	48	13
9	6	4	3	3	23	91	164	126	99	116	97	122	132	94	120	152	125	102	103	63	57	27	48	11
13	5	3	5	6	23	110	173	101	95	115	117	114	107	107	169	157	112	92	75	65	43	35	27	7
10	5	0	2	15	46	144	152	97	79	102	108	105	97	115	152	124	91	93	67	54	26	28	26	7

AM Peak 0700 - 0800 (636), AM PHF=0.92 PM Peak 1530 - 1630 (601), PM PHF=0.89

* Friday, 17 August 2007 - Total=7511, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
38	24	17	11	33	119	391	572	487	430	416	436	475	461	501	566	532	423	382	402	257	212	161	165	
13	7	7	1	2	10	65	148	153	106	106	113	113	121	114	129	126	128	89	118	64	48	45	54	31
11	6	4	5	4	32	79	130	119	110	97	118	112	107	135	129	135	105	77	111	70	59	35	55	27
7	7	5	3	11	29	124	137	120	112	100	81	122	128	125	166	132	103	115	97	47	61	45	25	20
7	6	1	2	16	48	123	157	95	102	113	124	128	105	127	142	139	87	101	76	76	44	36	31	17

AM Peak 0715 - 0815 (577), AM PHF=0.92 PM Peak 1530 - 1630 (569), PM PHF=0.86

* Saturday, 18 August 2007 - Total=5450, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
95	71	43	23	37	79	263	382	288	319	322	301	335	279	300	408	290	271	284	321	236	182	163	158	
31	14	12	9	5	12	40	100	77	88	74	68	84	67	63	84	81	65	64	80	59	54	47	56	27
27	23	7	7	9	13	56	92	73	83	86	80	71	67	74	122	72	78	53	104	62	37	41	42	28
20	23	7	2	16	21	75	98	75	64	70	73	88	82	84	117	69	71	71	65	58	42	36	27	16
17	11	17	5	7	33	92	92	63	84	92	80	92	63	79	85	68	57	96	72	57	49	39	33	11

AM Peak 0645 - 0745 (382), AM PHF=0.95 PM Peak 1500 - 1600 (408), PM PHF=0.84

* Sunday, 19 August 2007 - Total=3956, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
82	52	38	33	31	66	207	248	190	202	208	191	204	199	183	254	204	205	268	298	208	149	121	115	
27	18	10	8	6	8	40	70	52	51	54	53	51	50	54	51	48	47	67	79	54	37	31	33	11
28	13	11	6	10	14	38	77	43	56	41	46	39	58	37	80	50	44	73	86	66	39	34	52	17
16	16	12	10	6	14	47	49	47	55	58	47	59	49	52	67	48	55	54	74	48	34	29	17	9
11	5	5	9	9	30	82	52	48	40	55	45	55	42	40	56	58	59	74	59	40	39	27	13	8

AM Peak 0645 - 0745 (278), AM PHF=0.85 PM Peak 1845 - 1945 (313), PM PHF=0.91

* Monday, 20 August 2007 - Total=4223 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
45	18	17	13	35	115	386	576	422	375	428	402	372	362	404	-	-	-	-	-	-	-	-	-	
11	9	9	4	4	13	50	144	126	102	95	110	98	81	128	151	-	-	-	-	-	-	-	-	-
17	3	3	3	7	25	78	142	100	98	133	103	98	95	95	102	-	-	-	-	-	-	-	-	-
9	3	3	5	12	29	108	143	96	92	98	98	90	94	96	-	-	-	-	-	-	-	-	-	-
8	3	2	1	12	48	150	147	100	83	102	91	86	92	85	-	-	-	-	-	-	-	-	-	-

AM Peak 0645 - 0745 (579), AM PHF=0.96

APPENDIX D

DAILY CLASSES
(NORTH BOUND)

MetroCount Traffic Executive
Daily Classes

DailyClass-72 -- English (ENT)

Datasets:

Site:	**[Point Lisas SMR] Southern Main Road**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Point Lisas SMR23Aug2007.EC0 (Plus)
Identifier:	N3852KH0 MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 46074 / 94298 (48.86%)

Daily Classes

DailyClass-72

Site:	Point Lisas SMR.0SN
Description:	**Southern Main Road**
Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 06 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekdays													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekend													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-72

Site:	Point Lisas SMR.0SN
Description:	**Southern Main Road**
Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 13 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	7	3554	2	592	26	8	2	18	10	14	0	0	4233
(%)	0.2	84.0	0.0	14.0	0.6	0.2	0.0	0.4	0.2	0.3	0.0	0.0	
Tue	12	5752	7	966	67	23	3	25	25	20	3	2	6905
(%)	0.2	83.3	0.1	14.0	1.0	0.3	0.0	0.4	0.4	0.3	0.0	0.0	
Wed	14	5902	11	965	102	27	3	37	36	21	4	2	7124
(%)	0.2	82.8	0.2	13.5	1.4	0.4	0.0	0.5	0.5	0.3	0.1	0.0	
Thu	13	5869	6	978	104	30	0	20	21	22	0	2	7065
(%)	0.2	83.1	0.1	13.8	1.5	0.4	0.0	0.3	0.3	0.3	0.0	0.0	
Fri	15	6019	7	989	96	23	6	27	42	15	2	4	7245
(%)	0.2	83.1	0.1	13.7	1.3	0.3	0.1	0.4	0.6	0.2	0.0	0.1	
Sat	11	4392	2	589	81	15	3	13	18	25	0	0	5149
(%)	0.2	85.3	0.0	11.4	1.6	0.3	0.1	0.3	0.3	0.5	0.0	0.0	
Sun	15	3436	1	400	17	4	3	5	4	3	0	0	3888
(%)	0.4	88.4	0.0	10.3	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0	

Average daily volume

Entire week													
	12	4989	5	782	70	18	2	20	22	17	1	1	5944
(%)	0.2	83.9	0.1	13.2	1.2	0.3	0.0	0.3	0.4	0.3	0.0	0.0	
Weekdays													
	12	5419	6	898	79	22	2	25	26	18	1	2	6514
(%)	0.2	83.2	0.1	13.8	1.2	0.3	0.0	0.4	0.4	0.3	0.0	0.0	
Weekend													
	13	3914	1	494	49	9	3	9	11	14	0	0	4518
(%)	0.3	86.6	0.0	10.9	1.1	0.2	0.1	0.2	0.2	0.3	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-72

Site:	Point Lisas SMR.0SN
Description:	**Southern Main Road**
Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 20 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	11	3661	1	665	56	17	2	13	27	10	1	1	4465
(%)	0.2	82.0	0.0	14.9	1.3	0.4	0.0	0.3	0.6	0.2	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week No complete days.
Weekdays No complete days.
Weekend No complete days.

* - Incomplete

APPENDIX E

DAILY CLASSES
(SOUTH BOUND)

MetroCount Traffic Executive
Daily Classes

DailyClass-75 -- English (ENT)

Datasets:

Site:	**[Point Lisas SMR] Southern Main Road**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Point Lisas SMR23Aug2007.EC0 (Plus)
Identifier:	N3852KH0 MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48133 / 94298 (51.04%)

Daily Classes

DailyClass-75

Site:	Point Lisas SMR.0SN
Description:	**Southern Main Road**
Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 06 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekdays													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekend													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-75

Site:	Point Lisas SMR.0SN
Description:	**Southern Main Road**
Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 13 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	10	3998	1	919	46	7	0	30	13	2	0	2	5028
(%)	0.2	79.5	0.0	18.3	0.9	0.1	0.0	0.6	0.3	0.0	0.0	0.0	
Tue	12	5729	5	1236	72	2	4	48	33	3	3	1	7148
(%)	0.2	80.1	0.1	17.3	1.0	0.0	0.1	0.7	0.5	0.0	0.0	0.0	
Wed	16	5945	6	1247	130	12	4	55	47	10	2	3	7477
(%)	0.2	79.5	0.1	16.7	1.7	0.2	0.1	0.7	0.6	0.1	0.0	0.0	
Thu	15	5881	3	1225	130	7	1	30	37	7	1	3	7340
(%)	0.2	80.1	0.0	16.7	1.8	0.1	0.0	0.4	0.5	0.1	0.0	0.0	
Fri	20	6049	3	1226	98	8	1	37	53	9	2	5	7511
(%)	0.3	80.5	0.0	16.3	1.3	0.1	0.0	0.5	0.7	0.1	0.0	0.1	
Sat	12	4477	4	808	78	4	2	37	23	5	0	0	5450
(%)	0.2	82.1	0.1	14.8	1.4	0.1	0.0	0.7	0.4	0.1	0.0	0.0	
Sun	12	3382	1	530	18	1	2	5	3	2	0	0	3956
(%)	0.3	85.5	0.0	13.4	0.5	0.0	0.1	0.1	0.1	0.1	0.0	0.0	

Average daily volume

Entire week													
	13	5065	3	1027	81	5	2	34	29	5	1	2	6272
(%)	0.2	80.8	0.0	16.4	1.3	0.1	0.0	0.5	0.5	0.1	0.0	0.0	
Weekdays													
	14	5520	3	1170	95	7	2	40	36	6	1	2	6900
(%)	0.2	80.0	0.0	17.0	1.4	0.1	0.0	0.6	0.5	0.1	0.0	0.0	
Weekend													
	12	3929	2	669	48	2	2	21	13	3	0	0	4703
(%)	0.3	83.5	0.0	14.2	1.0	0.0	0.0	0.4	0.3	0.1	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-75

Site:	Point Lisas SMR.0SN
Description:	**Southern Main Road**
Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 20 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	9	3325	1	756	44	15	0	17	43	10	0	3	4223
(%)	0.2	78.7	0.0	17.9	1.0	0.4	0.0	0.4	1.0	0.2	0.0	0.1	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week No complete days.
Weekdays No complete days.
Weekend No complete days.

* - Incomplete

APPENDIX F

CLASS SPEED MATRIX
(NORTH BOUND)

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-73 -- English (ENT)

Datasets:

Site:	**[Point Lisas SMR] Southern Main Road**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Point Lisas SMR23Aug2007.EC0 (Plus)
Identifier:	N3852KH0 MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 46074 / 94298 (48.86%)

Class Speed Matrix

ClassMatrix-73
Site: Point Lisas SMR.0SN
Description: **Southern Main Road**
Filter time: **13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	2	52	.	11	4	1	.	.	1	1	.	.	72	0.2%
20 - 30	14	177	7	83	15	4	.	5	8	.	.	.	313	0.7%
30 - 40	11	1241	5	490	48	17	5	54	48	26	4	3	1952	4.2%
40 - 50	18	7918	18	1524	155	66	6	55	67	53	5	6	9891	21.5%
50 - 60	9	17218	4	2508	202	50	3	31	41	46	1	2	20115	43.7%
60 - 70	12	9248	2	1147	83	3	6	8	16	3	.	.	10528	22.9%
70 - 80	7	2111	1	282	34	2	2	1	2	.	.	.	2442	5.3%
80 - 90	14	468	.	80	7	3	.	4	.	1	.	.	577	1.3%
90 - 100	5	99	.	19	.	.	.	.	.	.	.	.	123	0.3%
100 - 110	3	34	.	.	.	1	.	.	.	.	.	.	38	0.1%
110 - 120	.	10	.	.	.	.	.	.	.	.	.	.	10	0.0%
120 - 130	2	4	.	.	.	.	.	.	.	.	.	.	6	0.0%
130 - 140	1	2	.	.	1	.	.	.	.	.	.	.	4	0.0%
140 - 150	.	3	.	.	.	.	.	.	.	.	.	.	3	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	98	38585	37	6144	549	147	22	158	183	130	10	11	46074	
	0.2%	83.7%	0.1%	13.3%	1.2%	0.3%	0.0%	0.3%	0.4%	0.3%	0.0%	0.0%		

APPENDIX G

CLASS SPEED MATRIX
(SOUTH BOUND)

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-74 -- English (ENT)

Datasets:

Site:	**[Point Lisas SMR] Southern Main Road**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Point Lisas SMR23Aug2007.EC0 (Plus)
Identifier:	N3852KH0 MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48133 / 94298 (51.04%)

Class Speed Matrix

ClassMatrix-74
Site: Point Lisas SMR.0SN
Description: **Southern Main Road**
Filter time: **13:34 Thursday, 09 August 2007 => 15:25 Monday, 20 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	25	55	.	13	1	2	1	.	.	.	.	.	97	0.2%
20 - 30	11	257	1	73	8	7	.	1	3	4	.	.	365	0.8%
30 - 40	13	1317	4	327	29	12	.	8	34	9	2	4	1759	3.7%
40 - 50	14	5389	9	1269	168	10	5	51	73	10	4	7	7009	14.6%
50 - 60	14	12456	1	2546	212	19	4	85	80	12	.	5	15434	32.1%
60 - 70	11	12323	5	2164	136	5	3	67	42	11	2	1	14770	30.7%
70 - 80	10	5136	4	1027	49	1	1	38	19	2	.	.	6287	13.1%
80 - 90	4	1429	.	388	12	.	.	9	1	.	.	.	1843	3.8%
90 - 100	2	325	.	117	1	.	.	.	.	.	.	.	445	0.9%
100 - 110	2	77	.	18	.	.	.	.	.	.	.	.	97	0.2%
110 - 120	.	15	.	5	.	.	.	.	.	.	.	.	20	0.0%
120 - 130	.	4	.	.	.	.	.	.	.	.	.	.	4	0.0%
130 - 140	.	1	.	.	.	.	.	.	.	.	.	.	1	0.0%
140 - 150	.	2	.	.	.	.	.	.	.	.	.	.	2	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
	106	38786	24	7947	616	56	14	259	252	48	8	17	48133	
Class Totals	0.2%	80.6%	0.0%	16.5%	1.3%	0.1%	0.0%	0.5%	0.5%	0.1%	0.0%	0.0%		

TRAFFIC COUNT DATA REPORT FOR SOUTHERN MAIN ROAD POINT LISAS, SEPTEMBER 2007

TRAFFIC COUNT DATA REPORT

FOR

SOUTHERN MAIN ROAD POINT LISAS

FOR

CARASIL

SEPTEMBER 2007

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APPENDIX F	-	CLASS SPEED MATRIX (NORTH BOUND LANE)
APPENDIX G	-	CLASS SPEED MATRIX (SOUTH BOUND LANE)

1.0 INTRODUCTION

Trintoplan Consultants Limited (TCL) was retained by CaraSil to undertake a traffic count on the Southern Main Road. The traffic count exercise was undertaken along the Southern Main Road, Point Lisas approximately 100m north of the entrance to YARA.

2.0 METHODOLOGY

The traffic count was carried out between the dates of Saturday 15, September 2007 to Saturday 22, September 2007. Automatic counts were carried out using our Metro Count Roadside Units, Model 5600. Counts were carried out at the locations specified by ECL.

2.1 Automatic Counts

The Metro Count Vehicle Classifier System combines robust hardware and sophisticated computer software to execute the counts and the vehicle classification.

The automatic counter is made of two main components. These are a roadside unit, which has the electronic circuitry for storage of digital data; and two pneumatic tubes that act as detectors for traffic. The pneumatic tubes are installed across the road with a known separation. When the vehicle's first axle hits the tubes, the classifier measures the traversal time to calculate its speed, and then uses subsequent hits to obtain the axle separation. The classifier uses the number of axles and axle separations to derive vehicle classes from a classification scheme. The order of tube hits gives the direction of travel. To distinguish vehicles, the classifier assumes a minimum inter-vehicle time.

The roadside unit does not process traffic data during the counts, rather it all axle events in a compressed format. The actual task of classifying the vehicles is performed later when the information is downloaded to a personal computer.

3.0 TRAFFIC COUNT DATA

The Classification Scheme is included as Appendix A and the traffic count data is included in Appendices B to G.

4.0 CLOSURE

We trust that the content of this report meets with your requirements and should you require further discussion or clarification, please do not hesitate to contact us.

Yours respectfully,

Saffraz A. Muhammad

Saffraz A. Muhammad
Civil Engineer, Geotechnical Department
Attach:

LIST OF APPENDICES

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APPENDIX A

CLASSIFICATION SCHEME

Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FHWA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	< 6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	< 10.0	10.0 - 18.0			
	car + 2 axle trailer	4	< 10.0		< 3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 - 15.0		< 3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			< 3.5	
4	bus	2	> 20.0				
	bus	3	> 19.0				
5	single unit truck - dual rear axle	2	14.9 - 20.0			< 3.5	
6	3 axle truck	3		< 18.0			
7	4 axle truck	4					
8	2S1	3		> 18.0			
	2S2	4		> 5.0	> 3.5		
	3S1	4		< 5.0	> 10.0		
9	3S2	5		< 6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		> 6.0			
12	3S1-2	6					> 10.0
13	truck	7 or more					
Ungrouped Classes							
14	unclassifiable vehicle						
0	unclassifiable axle event						

APPENDIX B

VEHICLE COUNTS
(NORTH BOUND)

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-83 -- English (ENT)

Datasets:

Site:	**[Southern Main Road] Point Lisas**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007
File:	C:\Program Files\MetroCount v316\User\Data\Southern Main Road25Sep2007.EC0 (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 45190 / 94157 (47.99%)

* Friday, 14 September 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0

* Saturday, 15 September 2007 - Total=3507, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	258	292	271	276	283	307	248	259	367	256	210	189	195	96	
0	0	0	0	0	0	0	0	0	0	60	71	67	79	62	58	59	48	92	57	49	52	47	24	18
0	0	0	0	0	0	0	0	0	0	59	65	82	54	67	80	66	64	89	77	51	48	63	20	22
0	0	0	0	0	0	0	0	0	0	72	68	66	62	77	89	50	74	91	60	56	48	43	24	21
0	0	0	0	0	0	0	0	0	0	67	88	56	81	77	80	73	73	95	62	54	41	42	28	10

AM Peak 1130 - 1230 (305), AM PHF=0.87 PM Peak 1800 - 1900 (367), PM PHF=0.97

* Sunday, 16 September 2007 - Total=4166, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
71	42	40	37	40	74	354	248	210	198	226	209	195	198	210	201	202	268	364	247	189	150	137	56	
18	14	7	10	7	10	55	81	58	52	70	43	45	48	51	52	59	70	78	69	50	47	37	23	20
22	9	15	10	7	10	93	67	58	37	45	59	57	58	48	47	43	61	90	62	56	35	39	13	7
21	14	8	8	10	12	96	54	47	58	50	61	42	43	56	54	44	67	97	65	38	37	26	12	9
10	5	10	9	16	42	110	46	47	51	61	46	51	49	55	48	56	70	99	51	45	31	35	8	7

AM Peak 0615 - 0715 (380), AM PHF=0.86 PM Peak 1800 - 1900 (364), PM PHF=0.92

* Monday, 17 September 2007 - Total=6857, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
43	25	12	5	30	181	697	659	403	397	398	409	385	403	460	353	474	381	409	256	173	109	119	76	
20	9	3	1	2	17	134	186	126	107	93	90	105	95	123	106	112	96	95	79	53	21	31	31	12
7	6	2	0	9	29	179	155	99	88	106	114	97	91	113	69	128	80	100	65	31	26	40	16	12
9	4	4	2	9	60	185	192	100	116	103	98	102	109	122	77	127	109	115	56	48	29	26	14	7
7	6	3	2	10	75	199	126	78	86	96	107	81	108	102	101	107	96	99	56	41	33	22	15	8

AM Peak 0615 - 0715 (749), AM PHF=0.94 PM Peak 1600 - 1700 (474), PM PHF=0.93

* Tuesday, 18 September 2007 - Total=6872, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
39	14	7	7	35	189	708	656	393	406	403	452	384	391	453	351	465	384	394	230	175	150	132	54	
12	3	2	3	7	26	137	185	115	98	97	109	105	82	98	76	119	91	101	72	46	36	35	20	12
12	2	2	1	3	34	186	158	101	101	95	104	102	93	127	89	116	96	83	62	49	35	37	17	10
7	8	1	0	8	49	177	155	86	94	111	125	87	101	123	88	129	89	112	44	46	43	36	11	3
8	1	2	3	17	80	208	158	91	113	100	114	90	115	105	98	101	108	98	52	34	36	24	6	5

AM Peak 0615 - 0715 (756), AM PHF=0.91 PM Peak 1600 - 1700 (465), PM PHF=0.90

* Wednesday, 19 September 2007 - Total=6954, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
30	17	10	12	32	192	674	697	480	343	414	464	382	359	399	418	458	386	408	242	182	149	156	50	
12	6	3	5	4	30	139	182	148	81	116	102	94	82	93	100	140	88	116	79	50	38	30	15	14
10	4	2	3	4	22	187	175	126	85	102	104	100	75	100	96	127	100	95	63	49	36	44	15	9
3	4	3	1	10	56	168	158	109	83	112	105	80	105	106	101	104	88	113	52	53	40	46	10	9
5	3	2	3	14	84	180	182	97	94	84	153	108	97	100	121	87	110	84	48	30	35	36	10	8

AM Peak 0615 - 0715 (717), AM PHF=0.96 PM Peak 1545 - 1645 (492), PM PHF=0.88

* Thursday, 20 September 2007 - Total=6967, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
40	25	10	9	42	189	661	649	498	399	392	431	396	429	422	359	439	376	398	252	187	154	139	71	
14	4	2	1	5	26	138	159	135	102	102	100	109	105	96	100	131	88	98	76	53	41	33	23	16
9	6	4	3	7	32	142	181	129	113	99	80	91	104	114	81	95	91	92	71	45	36	39	15	9
9	7	3	4	12	44	184	166	128	95	99	110	102	108	123	87	120	100	116	41	34	40	35	20	5
8	8	1	1	18	87	197	143	106	89	92	141	94	112	89	91	93	97	92	64	55	37	32	13	13

AM Peak 0630 - 0730 (721), AM PHF=0.91 PM Peak 1345 - 1445 (445), PM PHF=0.90

* Friday, 21 September 2007 - Total=7107, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
43	23	15	6	37	168	482	563	473	485	397	430	412	420	414	456	467	425	375	276	214	195	200	131	
16	5	2	3	5	27	123	122	128	132	100	86	114	112	104	97	119	142	81	86	52	48	48	45	26
9	5	5	1	7	21	122	163	139	124	99	100	103	85	99	136	106	91	98	64	58	48	53	32	23
5	10	2	1	12	42	92	135	80	112	112	106	97	133	118	110	150	101	105	67	62	55	65	27	8
13	3	6	1	13	78	145	143	126	117	86	138	98	90	93	113	92	91	91	59	42	44	34	27	14

AM Peak 0715 - 0815 (569), AM PHF=0.87 PM Peak 1615 - 1715 (490), PM PHF=0.82

* Saturday, 22 September 2007 - Total=2760, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
71	46	33	29	26	123	488	425	306	274	289	259	262	129	0	0	0	0	0	0	0	0	0	0	
26	11	5	10	3	14	79	112	78	69	72	55	69	57	0	0	0	0	0	0	0	0	0	0	0
23	12	13	9	7	17	145	114	87	80	76	64	65	48	0	0	0	0	0	0	0	0	0	0	0
8	10	7	4	7	36	142	105	72	56	59	69	76	24	0	0	0	0	0	0	0	0	0	0	0
14	13	8	6	9	56	122	94	69	69	82	71	52	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0615 - 0715 (521), AM PHF=0.90 PM Peak 1200 - 1300 (262), PM PHF=0.86

* Sunday, 23 September 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Monday, 24 September 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Tuesday, 25 September 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX C

VEHICLE COUNTS
(SOUTH BOUND)

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-84 -- English (ENT)

Datasets:

Site:	**[Southern Main Road] Point Lisas**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007
File:	C:\Program Files\MetroCount v316\User\Data\Southern Main Road25Sep2007.EC0 (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48871 / 94157 (51.90%)

* Friday, 14 September 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0

* Saturday, 15 September 2007 - Total=4060, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	321	314	300	305	307	380	311	283	349	419	251	192	153	175	
0	0	0	0	0	0	0	0	0	0	79	81	72	91	77	85	97	72	87	123	59	51	40	54	21
0	0	0	0	0	0	0	0	0	0	76	80	78	77	78	109	76	65	84	130	70	54	43	47	15
0	0	0	0	0	0	0	0	0	0	82	73	71	69	75	107	67	83	88	91	59	47	34	41	20
0	0	0	0	0	0	0	0	0	0	84	80	79	68	77	79	71	63	90	75	63	40	36	33	17

AM Peak 1030 - 1130 (327), AM PHF=0.97 PM Peak 1845 - 1945 (434), PM PHF=0.83

* Sunday, 16 September 2007 - Total=4374, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
73	53	39	35	35	83	208	318	218	195	208	193	212	210	247	267	250	282	312	379	209	135	117	96	
21	13	9	8	6	18	28	83	51	53	70	49	62	57	53	67	81	72	61	114	57	33	34	35	9
15	15	7	7	6	19	43	88	62	53	49	55	48	52	76	71	49	80	84	123	51	41	22	25	11
20	13	11	6	14	15	60	78	54	50	47	43	68	50	64	70	62	67	70	77	46	26	27	20	4
17	12	12	14	9	31	77	69	51	39	42	46	54	51	54	59	58	63	97	65	55	35	34	16	10

AM Peak 0645 - 0745 (326), AM PHF=0.93 PM Peak 1845 - 1945 (411), PM PHF=0.84

* Monday, 17 September 2007 - Total=7447, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
34	32	13	4	44	129	458	664	427	386	419	417	444	444	429	567	553	478	434	473	224	150	112	112	
9	9	3	1	6	17	70	158	130	88	117	123	118	110	108	110	141	131	98	163	61	34	26	47	6
11	9	1	2	7	26	106	163	105	87	84	91	110	110	95	165	145	129	110	144	56	45	29	26	8
4	6	4	0	12	32	145	176	104	98	101	91	92	118	113	178	128	103	117	89	55	32	30	23	8
10	8	5	1	19	54	137	167	88	113	117	112	124	106	113	114	139	115	109	77	52	39	27	16	4

AM Peak 0700 - 0800 (664), AM PHF=0.94 PM Peak 1515 - 1615 (598), PM PHF=0.84

* Tuesday, 18 September 2007 - Total=7445, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
26	22	18	12	47	116	490	638	449	395	395	429	467	410	450	546	544	445	442	458	239	180	109	118	
6	4	4	6	13	22	81	166	112	97	91	118	121	111	109	137	131	117	86	141	68	48	29	41	3
8	6	8	2	14	22	100	152	124	93	107	108	119	108	114	151	139	119	120	151	69	48	25	47	8
8	4	4	3	8	27	149	163	115	106	101	105	112	91	111	151	151	108	125	82	54	41	27	21	8
4	8	2	1	12	45	160	157	98	99	96	98	115	100	116	107	123	101	111	84	48	43	28	9	11

AM Peak 0645 - 0745 (641), AM PHF=0.97 PM Peak 1445 - 1545 (555), PM PHF=0.92

* Wednesday, 19 September 2007 - Total=7527, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
30	23	11	10	42	114	476	641	463	419	403	412	438	469	460	505	576	448	425	460	251	181	140	130	
3	9	3	4	10	11	74	161	142	111	81	102	106	125	102	115	156	134	89	151	73	48	31	49	12
8	6	5	2	5	28	103	171	123	92	96	122	107	103	121	126	139	98	108	145	57	47	42	39	10
8	3	0	0	13	28	152	158	100	100	96	96	108	123	112	142	148	114	107	94	74	38	38	24	8
11	5	3	4	14	47	147	151	98	116	130	92	117	118	125	122	133	102	121	70	47	48	29	18	11

AM Peak 0700 - 0800 (641), AM PHF=0.94 PM Peak 1600 - 1700 (576), PM PHF=0.92

* Thursday, 20 September 2007 - Total=7566, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
41	31	10	11	46	129	478	663	460	385	446	427	416	452	455	543	550	478	440	434	234	174	132	131	
12	13	3	2	5	18	62	144	130	81	109	112	108	109	98	103	143	142	102	119	69	48	28	48	14
10	4	4	3	9	22	113	184	125	100	109	111	106	110	118	152	151	114	98	152	66	43	36	46	8
8	10	3	3	15	36	144	156	109	120	120	105	98	129	120	163	146	121	123	85	56	43	32	23	12
11	4	0	3	17	53	159	179	96	84	108	99	104	104	119	125	110	101	117	78	43	40	36	14	9

AM Peak 0700 - 0800 (663), AM PHF=0.90 PM Peak 1515 - 1615 (583), PM PHF=0.89

* Friday, 21 September 2007 - Total=7654, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
43	22	18	11	51	138	423	564	420	410	414	449	459	446	481	572	521	432	437	451	299	197	212	184	
14	8	6	1	5	22	72	139	135	90	90	122	106	105	110	150	150	112	103	122	88	52	43	57	24
8	4	4	3	10	24	93	163	108	116	115	116	118	122	143	144	122	103	113	137	79	46	49	56	26
12	8	4	3	16	40	129	134	91	99	109	116	106	108	118	149	131	110	110	108	63	46	69	47	20
9	2	4	4	19	52	129	128	86	105	100	95	129	111	110	129	118	107	111	84	69	53	51	24	17

AM Peak 0645 - 0745 (565), AM PHF=0.87 PM Peak 1500 - 1600 (572), PM PHF=0.95

* Saturday, 22 September 2007 - Total=2798, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
87	57	32	38	42	84	318	429	320	297	296	315	328	155	0	0	0	0	0	0	0	0	0	0	
24	15	10	11	14	14	63	111	75	62	65	63	77	62	0	0	0	0	0	0	0	0	0	0	0
26	16	9	13	11	22	66	122	92	52	77	91	82	73	0	0	0	0	0	0	0	0	0	0	0
20	14	8	7	10	15	83	98	76	89	88	81	89	20	0	0	0	0	0	0	0	0	0	0	0
17	12	5	7	7	33	106	98	77	94	66	80	80	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0645 - 0745 (437), AM PHF=0.90 PM Peak 1200 - 1300 (328), PM PHF=0.92

* Sunday, 23 September 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Monday, 24 September 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Tuesday, 25 September 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX D

DAILY CLASSES
(NORTH BOUND)

MetroCount Traffic Executive
Daily Classes

DailyClass-85 -- English (ENT)

Datasets:

Site:	**[Southern Main Road] Point Lisas**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007
File:	C:\Program Files\MetroCount v316\User\Data\Southern Main Road25Sep2007.EC0 (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 45190 / 94157 (47.99%)

Daily Classes

DailyClass-85
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 10 September 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat	6	3283	9	123	43	3	3	14	20	2	1	0	3507
(%)	0.2	93.6	0.3	3.5	1.2	0.1	0.1	0.4	0.6	0.1	0.0	0.0	
Sun	10	4001	5	121	16	2	1	5	2	3	0	0	4166
(%)	0.2	96.0	0.1	2.9	0.4	0.0	0.0	0.1	0.0	0.1	0.0	0.0	

Average daily volume

Entire week

	8	3642	7	122	29	2	2	9	11	2	0	0	3836
(%)	0.2	94.9	0.2	3.2	0.8	0.1	0.1	0.2	0.3	0.1	0.0	0.0	

Weekdays No complete days.
Weekend

	8	3642	7	122	29	2	2	9	11	2	0	0	3836
(%)	0.2	94.9	0.2	3.2	0.8	0.1	0.1	0.2	0.3	0.1	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-85
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 17 September 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	15	6215	15	464	54	9	4	40	27	10	2	2	6857
(%)	0.2	90.6	0.2	6.8	0.8	0.1	0.1	0.6	0.4	0.1	0.0	0.0	
Tue	11	6221	23	454	56	8	7	41	36	13	2	0	6872
(%)	0.2	90.5	0.3	6.6	0.8	0.1	0.1	0.6	0.5	0.2	0.0	0.0	
Wed	14	6323	12	448	65	10	3	37	29	6	1	6	6954
(%)	0.2	90.9	0.2	6.4	0.9	0.1	0.0	0.5	0.4	0.1	0.0	0.1	
Thu	12	6290	11	487	74	6	7	34	36	8	1	1	6967
(%)	0.2	90.3	0.2	7.0	1.1	0.1	0.1	0.5	0.5	0.1	0.0	0.0	
Fri	12	6401	17	502	60	13	3	43	43	7	3	3	7107
(%)	0.2	90.1	0.2	7.1	0.8	0.2	0.0	0.6	0.6	0.1	0.0	0.0	
Sat	7	2525	3	162	26	0	0	9	19	9	0	0	2760
(%)	0.3	91.5	0.1	5.9	0.9	0.0	0.0	0.3	0.7	0.3	0.0	0.0	
Sun	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	10	4853	11	359	47	6	3	29	27	7	1	1	5359
(%)	0.2	90.6	0.2	6.7	0.9	0.1	0.1	0.5	0.5	0.1	0.0	0.0	
Weekdays													
	12	6290	15	471	61	9	4	39	34	8	1	2	6951
(%)	0.2	90.5	0.2	6.8	0.9	0.1	0.1	0.6	0.5	0.1	0.0	0.0	
Weekend													
	3	1262	1	81	13	0	0	4	9	4	0	0	1380
(%)	0.2	91.4	0.1	5.9	0.9	0.0	0.0	0.3	0.7	0.3	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-85
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 24 September 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekdays													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Weekend No complete days.

* - Incomplete

APPENDIX E

DAILY CLASSES
(SOUTH BOUND)

MetroCount Traffic Executive
Daily Classes

DailyClass-86 -- English (ENT)

Datasets:

Site:	**[Southern Main Road] Point Lisas**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007
File:	C:\Program Files\MetroCount v316\User\Data\Southern Main Road25Sep2007.EC0 (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48871 / 94157 (51.90%)

Daily Classes

DailyClass-86
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 10 September 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat	10	3708	6	256	40	4	2	20	12	1	0	1	4060
(%)	0.2	91.3	0.1	6.3	1.0	0.1	0.0	0.5	0.3	0.0	0.0	0.0	
Sun	11	4103	2	220	17	0	2	9	7	3	0	0	4374
(%)	0.3	93.8	0.0	5.0	0.4	0.0	0.0	0.2	0.2	0.1	0.0	0.0	

Average daily volume

Entire week

	10	3905	4	238	28	2	2	14	9	2	0	0	4217
(%)	0.2	92.6	0.1	5.6	0.7	0.0	0.0	0.3	0.2	0.0	0.0	0.0	

Weekdays No complete days.
Weekend

	10	3905	4	238	28	2	2	14	9	2	0	0	4217
(%)	0.2	92.6	0.1	5.6	0.7	0.0	0.0	0.3	0.2	0.0	0.0	0.0	

*** - Incomplete**

Daily Classes

DailyClass-86
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 17 September 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	18	6587	12	655	59	10	3	55	33	10	1	4	7447
(%)	0.2	88.5	0.2	8.8	0.8	0.1	0.0	0.7	0.4	0.1	0.0	0.1	
Tue	22	6666	14	600	58	11	1	38	27	7	0	1	7445
(%)	0.3	89.5	0.2	8.1	0.8	0.1	0.0	0.5	0.4	0.1	0.0	0.0	
Wed	18	6690	14	644	80	11	2	39	21	4	1	3	7527
(%)	0.2	88.9	0.2	8.6	1.1	0.1	0.0	0.5	0.3	0.1	0.0	0.0	
Thu	29	6676	16	678	68	18	0	32	34	13	1	1	7566
(%)	0.4	88.2	0.2	9.0	0.9	0.2	0.0	0.4	0.4	0.2	0.0	0.0	
Fri	19	6714	14	708	76	12	2	48	47	10	2	2	7654
(%)	0.2	87.7	0.2	9.3	1.0	0.2	0.0	0.6	0.6	0.1	0.0	0.0	
Sat	6	2508	0	205	35	3	0	19	18	3	0	1	2798
(%)	0.2	89.6	0.0	7.3	1.3	0.1	0.0	0.7	0.6	0.1	0.0	0.0	
Sun	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	16	5120	10	498	53	9	1	33	25	6	0	1	5776
(%)	0.3	88.6	0.2	8.6	0.9	0.2	0.0	0.6	0.4	0.1	0.0	0.0	
Weekdays													
	21	6666	14	657	68	12	1	42	32	8	1	2	7527
(%)	0.3	88.6	0.2	8.7	0.9	0.2	0.0	0.6	0.4	0.1	0.0	0.0	
Weekend													
	3	1254	0	102	17	1	0	9	9	1	0	0	1399
(%)	0.2	89.6	0.0	7.3	1.2	0.1	0.0	0.6	0.6	0.1	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-86
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 24 September 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekdays													
	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Weekend No complete days.

* - Incomplete

APPENDIX F

CLASS SPEED MATRIX
(NORTH BOUND)

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-87 -- English (ENT)

Datasets:

Site:	**[Southern Main Road] Point Lisas**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007
File:	C:\Program Files\MetroCount v316\User\Data\Southern Main Road25Sep2007.EC0 (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 45190 / 94157 (47.99%)

Class Speed Matrix

ClassMatrix-87
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	9	38	.	4	2	.	.	.	2	.	.	.	55	0.1%
20 - 30	10	211	4	62	15	5	1	20	19	12	2	.	361	0.8%
30 - 40	18	1932	28	402	56	13	5	66	68	15	3	3	2609	5.8%
40 - 50	16	11163	41	927	134	20	13	82	81	24	5	8	12514	27.7%
50 - 60	11	18675	17	987	131	10	7	37	37	7	.	1	19920	44.1%
60 - 70	10	7457	5	295	46	2	1	15	5	.	.	.	7836	17.3%
70 - 80	8	1425	.	61	10	.	.	3	.	.	.	.	1507	3.3%
80 - 90	3	289	.	17	.	.	1	.	.	.	.	.	310	0.7%
90 - 100	2	56	.	5	.	.	.	.	.	.	.	.	63	0.1%
100 - 110	.	12	.	1	.	.	.	.	.	.	.	.	13	0.0%
110 - 120	.	1	.	.	.	1	.	.	.	.	.	.	2	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	87	41259	95	2761	394	51	28	223	212	58	10	12	45190	
	0.2%	91.3%	0.2%	6.1%	0.9%	0.1%	0.1%	0.5%	0.5%	0.1%	0.0%	0.0%		

APPENDIX G

CLASS SPEED MATRIX
(SOUTH BOUND)

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-88 -- English (ENT)

Datasets:

Site:	**[Southern Main Road] Point Lisas**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007
File:	C:\Program Files\MetroCount v316\User\Data\Southern Main Road25Sep2007.EC0 (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 48871 / 94157 (51.90%)

Class Speed Matrix

ClassMatrix-88
Site: Southern Main Road.0SN
Description: **Point Lisas**
Filter time: **18:00 Friday, 14 September 2007 => 09:52 Tuesday, 25 September 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	43	120	.	10	1	3	1	.	1	.	1	.	180	0.4%
20 - 30	13	488	8	56	7	10	.	1	2	1	.	.	586	1.2%
30 - 40	15	2309	27	328	60	26	1	23	26	15	.	5	2835	5.8%
40 - 50	15	9549	29	1094	145	13	3	84	68	15	2	4	11021	22.6%
50 - 60	25	17405	10	1405	144	9	4	102	61	14	2	4	19185	39.3%
60 - 70	12	10245	3	730	54	8	3	40	34	4	.	.	11133	22.8%
70 - 80	2	2875	1	266	19	.	.	10	7	2	.	.	3182	6.5%
80 - 90	7	564	.	59	2	.	.	.	.	.	.	.	632	1.3%
90 - 100	1	83	.	16	1	.	.	.	.	.	.	.	101	0.2%
100 - 110	.	11	.	2	.	.	.	.	.	.	.	.	13	0.0%
110 - 120	.	3	.	.	.	.	.	.	.	.	.	.	3	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	133	43652	78	3966	433	69	12	260	199	51	5	13	48871	
	0.3%	89.3%	0.2%	8.1%	0.9%	0.1%	0.0%	0.5%	0.4%	0.1%	0.0%	0.0%		

Traffic Modelling Output

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

```
Analyst:              Larry O'Rourke
Agency/Co.:           ICF
Date Performed:       10/9/2007
Analysis Time Period: September
Intersection:         Southern Main Road
Jurisdiction:
Units: U. S. Customary
Analysis Year:        2007
Project ID:
East/West Street:
North/South Street:
Intersection Orientation: NS                 Study period (hrs):  0.25
```

Vehicle Volumes and Adjustments

```
Major Street:  Approach        Northbound              Southbound
               Movement     1      2      3     |  4      5      6
                            L      T      R     |  L      T      R
Volume                      0      968    45       45     839    0
Peak-Hour Factor, PHF       1.00   1.00   1.00     1.00   1.00   1.00
Hourly Flow Rate, HFR       0      968    45       45     839    0
Percent Heavy Vehicles      5      --     --       5      --     --
Median Type/Storage         Undivided             /
RT Channelized?
Lanes                          0   1    0             0   1    0
Configuration                   LTR                     LTR
Upstream Signal?                   No                      No
Minor Street:  Approach        Westbound               Eastbound
               Movement     7      8      9     |  10     11     12
                            L      T      R     |  L      T      R
Volume                      0      8      0        0      8      0
Peak Hour Factor, PHF       1.00   1.00   1.00     1.00   1.00   1.00
Hourly Flow Rate, HFR       0      8      0        0      8      0
Percent Heavy Vehicles      5      5      5        5      5      5
Percent Grade (%)                  0                       0
Flared Approach:  Exists?/Storage         No     /               No     /
Lanes                          0   1    0             0   1    0
Configuration                      LTR                     LTR
```

Delay, Queue Length, and Level of Service

```
Approach            NB     SB        Westbound             Eastbound
Movement            1      4   |  7      8      9    |  10     11     12
Lane Config         LTR    LTR |         LTR         |         LTR
v (vph)             0      45           8                      8
C(m) (vph)          783    673          57                     56
v/c                 0.00   0.07         0.14                   0.14
95% queue length    0.00   0.21         0.46                   0.46
Control Delay       9.6    10.7         78.2                   79.7
LOS                  A      B            F                      F
Approach Delay                          78.2                   79.7
Approach LOS                             F                      F
```

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Larry O'Rourke
Agency/Co.: ICF
Date Performed: 10/9/2007
Analysis Time Period: September
Intersection: Southern Main Road
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2007
Project ID:
East/West Street:
North/South Street:
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	968	45	45	839	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	242	11	11	210	0
Hourly Flow Rate, HFR	0	968	45	45	839	0
Percent Heavy Vehicles	5	--	--	5	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal?		No			No	

Minor Street Movements	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	8	0	0	8	0
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	2	0	0	2	0
Hourly Flow Rate, HFR	0	8	0	0	8	0
Percent Heavy Vehicles	5	5	5	5	5	5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		No /
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0
Lane Width (ft)	12.0	12.0	12.0	12.0
Walking Speed (ft/sec)	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	0

Upstream Signal Data

		Prog. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal feet
S2	Left-Turn							
	Through							
S5	Left-Turn							
	Through							

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
Shared ln volume, major th vehicles:	968	839
Shared ln volume, major rt vehicles:	45	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement		1	4	7	8	9	10	11	12
		L	L	L	T	R	L	T	R
t(c,base)		4.1	4.1	7.1	6.5	6.2	7.1	6.5	6.2
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)		5	5	5	5	5	5	5	5
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Grade/100				0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.2	4.2	7.2	6.6	6.3	7.2	6.6	6.3
	2-stage								

Follow-Up Time Calculations

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(f,base)	2.20	2.20	3.50	4.00	3.30	3.50	4.00	3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	5	5	5	5	5	5	5	5
t(f)	2.2	2.2	3.5	4.0	3.3	3.5	4.0	3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
V prog				
Total Saturation Flow Rate, s (vph)				
Arrival Type				
Effective Green, g (sec)				
Cycle Length, C (sec)				
Rp (from Exhibit 16-11)				
Proportion vehicles arriving on green P				
g(q1)				
g(q2)				
g(q)				

Computation 2-Proportion of TWSC Intersection Time blocked

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
alpha				
beta				
Travel time, t(a) (sec)				
Smoothing Factor, F				
Proportion of conflicting flow, f				
Max platooned flow, V(c,max)				
Min platooned flow, V(c,min)				
Duration of blocked period, t(p)				
Proportion time blocked, p		0.000		0.000

Computation 3-Platoon Event Periods	**Result**
p(2)	0.000
p(5)	0.000
p(dom)	
p(subo)	
Constrained or unconstrained?	

Proportion unblocked for minor movements, p(x)	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Two-Stage Process Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

Computation 4 and 5
Single-Stage Process

Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
V c,x	839	1013	1923	1919	990	1923	1942	839
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11	
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s	1500		1500		1500		1500	
P(x)								
V(c,u,x)								
C(r,x)								
C(plat,x)								

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	990	839
Potential Capacity	295	361
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	295	361
Probability of Queue free St.	1.00	1.00
Step 2: LT from Major St.	4	1
Conflicting Flows	1013	839
Potential Capacity	673	783
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	673	783
Probability of Queue free St.	0.93	1.00
Maj L-Shared Prob Q free St.	0.87	1.00
Step 3: TH from Minor St.	8	11
Conflicting Flows	1919	1942
Potential Capacity	66	64
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.87	0.87
Movement Capacity	57	56
Probability of Queue free St.	0.86	0.86
Step 4: LT from Minor St.	7	10
Conflicting Flows	1923	1923
Potential Capacity	50	50
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.74	0.75
Maj. L, Min T Adj. Imp Factor.	0.80	0.80
Cap. Adj. factor due to Impeding mvmnt	0.80	0.80
Movement Capacity	40	40

Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance

Step 3: TH from Minor St.	8	11
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Probability of Queue free St.		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows	1919	1942
Potential Capacity	66	64
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.87	0.87
Movement Capacity	57	56
Result for 2 stage process:		
a		
y		
C t	57	56
Probability of Queue free St.	0.86	0.86
Step 4: LT from Minor St.	7	10
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows	1923	1923
Potential Capacity	50	50
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.74	0.75
Maj. L, Min T Adj. Imp Factor.	0.80	0.80
Cap. Adj. factor due to Impeding mvmnt	0.80	0.80
Movement Capacity	40	40
Results for Two-stage process:		
a		
y		
C t	40	40

Worksheet 8-Shared Lane Calculations

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (vph)	0	8	0	0	8	0
Movement Capacity (vph)	40	57	295	40	56	361
Shared Lane Capacity (vph)		57			56	

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
C sep	40	57	295	40	56	361
Volume	0	8	0	0	8	0
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						
n max						
C sh		57			56	
SUM C sep						
n						
C act						

Worksheet 10-Delay, Queue Length, and Level of Service

Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	0	45		8			8	
C(m) (vph)	783	673		57			56	
v/c	0.00	0.07		0.14			0.14	
95% queue length	0.00	0.21		0.46			0.46	
Control Delay	9.6	10.7		78.2			79.7	
LOS	A	B		F			F	
Approach Delay				78.2			79.7	
Approach LOS				F			F	

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	0.93
v(il), Volume for stream 2 or 5	968	839
v(i2), Volume for stream 3 or 6	45	0
s(il), Saturation flow rate for stream 2 or 5	1700	1700
s(i2), Saturation flow rate for stream 3 or 6	1700	1700
P*(oj)	1.00	0.87
d(M,LT), Delay for stream 1 or 4	9.6	10.7
N, Number of major street through lanes	1	1
d(rank,1)		
Delay for stream 2 or 5	0.0	1.4

TRAFFIC COUNT DATA REPORT FOR PACIFIC AVENUE POINT LISAS, AUGUST 2007

TRAFFIC COUNT DATA REPORT

FOR

PACIFIC AVENUE, POINT LISAS

FOR

CARASIL

AUGUST 2007

Trintoplan Consultants Limited
Orange Grove Road, Tacarigua
P.O. Box 1262, Port of Spain.
TRINIDAD & TOBAGO W.I.

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Fax : (868) 640-0708
E-Mail – ttplan@tstt.net.tt

August 24, 2007 File: 4143

Carasil
3 Pelham Street
PORT OF SPAIN

Attention: Mr. Roger Moore

Dear Sir,

RE: TRAFFIC COUNTS FOR PACIFIC AVENUE, POINT LISAS

We are pleased to submit four (4) copies of the automated traffic count report for the above captioned project.

We trust that the contents of this report meets with your requirements and we are here at your convenience should you require any further discussions or clarifications.

Yours respectfully,

Saffraz A Muhammad

Saffraz A. Muhammad
Civil Engineer, Geotechnical Department

TRAFFIC COUNT DATA REPORT

FOR

PACIFIC AVENUE, POINT LISAS

FOR

CARASIL

AUGUST 2007

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APPENDIX B	-	VEHICLE COUNTS (NORTH BOUND LANE)
APPENDIX C	-	VEHICLE COUNTS (SOUTH BOUND LANE)
APPENDIX D	-	DAILY CLASSES (NORTH BOUND LANE)
APPENDIX E	-	DAILY CLASSES (SOUTH BOUND LANE)
APPENDIX F	-	CLASS SPEED MATRIX (NORTH BOUND LANE)
APPENDIX G	-	CLASS SPEED MATRIX (SOUTH BOUND LANE)

1.0 INTRODUCTION

Trintoplan Consultants Limited (TCL) was retained by CaraSil to undertake a traffic count In the Point Lisas Area. The traffic count exercise was undertaken along Pacific Avenue, Point Lisas approximately 200m south of the entrance to DESALCOTT.

2.0 METHODOLOGY

The traffic count was carried out between the dates of Monday 12, August 2007 to Tuesday 19, August 2007. Automatic counts were carried out using our Metro Count Roadside Units, Model 5600. Counts were carried out at the locations specified by ECL.

2.1 Automatic Counts

The Metro Count Vehicle Classifier System combines robust hardware and sophisticated computer software to execute the counts and the vehicle classification.

The automatic counter is made of two main components. These are a roadside unit, which has the electronic circuitry for storage of digital data; and two pneumatic tubes that act as detectors for traffic. The pneumatic tubes are installed across the road with a known separation. When the vehicle's first axle hits the tubes, the classifier measures the traversal time to calculate its speed, and then uses subsequent hits to obtain the axle separation. The classifier uses the number of axles and axle separations to derive vehicle classes from a classification scheme. The order of tube hits gives the direction of travel. To distinguish vehicles, the classifier assumes a minimum inter-vehicle time.

The roadside unit does not process traffic data during the counts, rather it all axle events in a compressed format. The actual task of classifying the vehicles is performed later when the information is downloaded to a personal computer.

3.0 TRAFFIC COUNT DATA

The Classification Scheme is included as Appendix A and the traffic count data is included in Appendices B to G.

4.0 CLOSURE

We trust that the content of this report meets with your requirements and should you require further discussion or clarification, please do not hesitate to contact us.

Yours respectfully,

Saffraz A. Muhammad

Saffraz A. Muhammad
Civil Engineer, Geotechnical Department
Attach:

LIST OF APPENDICES

APPENDIX A	-	CLASSIFICATION SCHEME
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APPENDIX C	-	VEHICLE COUNTS (SOUTH BOUND LANE)
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APPENDIX G	-	CLASS SPEED MATRIX (SOUTH BOUND LANE)

APPENDIX A

CLASSIFICATION SCHEME

Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FHWA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	< 6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	< 10.0	10.0 - 18.0			
	car + 2 axle trailer	4	< 10.0		< 3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 - 15.0		< 3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			< 3.5	
4	bus	2	> 20.0				
	bus	3	> 19.0				
5	single unit truck - dual rear axle	2	14.9 - 20.0			< 3.5	
6	3 axle truck	3		< 18.0			
7	4 axle truck	4					
8	2S1	3		> 18.0			
	2S2	4		> 5.0	> 3.5		
	3S1	4		< 5.0	> 10.0		
9	3S2	5		< 6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		> 6.0			
12	3S1-2	6					> 10.0
13	truck	7 or more					
Ungrouped Classes							
14	unclassifiable vehicle						
0	unclassifiable axle event						

APPENDIX B

VEHICLE COUNTS
(NORTH BOUND)

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-76 -- English (ENT)

Datasets:

Site:	**[Point Lisas Atlantic] Atlantic**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Pacific_Avenue_23Aug2007.ECO (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16376 / 33295 (49.18%)

* Thursday, 09 August 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0

* Friday, 10 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Saturday, 11 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Sunday, 12 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Monday, 13 August 2007 - Total=992, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	33	147	148	116	147	112	85	50	75	27	8	10	28	6	
0	0	0	0	0	0	0	0	0	0	0	41	47	30	29	24	15	12	16	11	3	2	4	2	2
0	0	0	0	0	0	0	0	0	0	0	33	41	25	40	24	32	13	18	6	2	0	7	2	1
0	0	0	0	0	0	0	0	0	0	0	20	27	25	34	35	23	7	19	4	1	3	9	1	0
0	0	0	0	0	0	0	0	0	0	33	53	33	36	44	29	15	18	22	6	2	5	8	1	0

AM Peak 1145 - 1245 (168), AM PHF=0.79 PM Peak 1200 - 1300 (148), PM PHF=0.79

* Tuesday, 14 August 2007 - Total=2408, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	2	0	1	4	44	380	453	206	151	147	143	149	148	123	125	95	55	79	27	20	14	30	9	
2	0	0	0	1	2	49	135	78	34	24	42	47	28	32	31	24	9	21	11	6	4	5	2	1
1	0	0	0	0	8	65	119	57	31	47	24	42	43	36	33	23	15	29	3	7	1	7	2	1
0	2	0	1	1	12	112	95	34	45	45	33	32	49	27	33	28	15	8	7	5	3	10	2	0
0	0	0	0	2	22	154	104	37	41	31	44	28	28	28	28	20	16	21	6	2	6	7	3	1

AM Peak 0630 - 0730 (520), AM PHF=0.84 PM Peak 1315 - 1415 (152), PM PHF=0.78

* Wednesday, 15 August 2007 - Total=2562, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	2	2	1	6	54	413	442	227	168	152	156	161	152	157	143	93	62	71	27	13	17	35	5	
1	1	1	0	0	8	50	124	97	48	46	28	46	34	42	45	22	16	14	12	2	4	9	1	2
1	0	0	1	0	6	79	126	36	25	29	37	37	36	44	29	25	9	16	4	6	2	8	1	2
0	1	0	0	4	17	124	103	46	37	43	49	37	37	33	41	23	13	22	8	3	2	10	2	1
1	0	1	0	2	23	160	89	48	58	34	42	41	45	38	28	23	24	19	3	2	9	9	1	0

AM Peak 0630 - 0730 (534), AM PHF=0.83 PM Peak 1330 - 1430 (168), PM PHF=0.93

* Thursday, 16 August 2007 - Total=2428, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	1	1	2	2	54	401	441	202	136	133	160	183	141	154	106	79	52	50	32	23	25	41	4	
2	0	1	1	0	2	44	125	79	31	38	34	44	44	40	23	28	20	11	12	5	8	8	2	0
2	0	0	1	0	6	89	132	44	33	30	41	45	38	39	30	17	11	13	5	9	2	13	1	0
1	0	0	0	0	16	120	92	37	47	35	41	42	30	47	29	22	16	13	9	4	6	12	0	2
0	1	0	0	2	30	148	92	42	25	30	44	52	29	28	24	12	5	13	6	5	9	8	1	2

AM Peak 0630 - 0730 (525), AM PHF=0.89 PM Peak 1200 - 1300 (183), PM PHF=0.88

* Friday, 17 August 2007 - Total=2361, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	1	3	6	5	49	353	438	202	122	132	156	131	154	171	128	107	49	56	36	15	10	26	7	
0	1	0	0	1	4	37	149	69	34	22	30	45	31	45	23	31	19	13	12	8	5	5	4	0
0	0	3	0	0	6	75	89	53	24	49	35	31	43	38	41	31	12	18	10	1	1	5	0	4
2	0	0	4	3	16	112	94	42	30	32	48	26	36	47	36	23	6	12	8	4	0	9	2	1
2	0	0	2	1	23	129	106	43	34	29	43	29	44	41	28	22	12	13	6	2	4	7	1	0

AM Peak 0630 - 0730 (479), AM PHF=0.80 PM Peak 1345 - 1445 (174), PM PHF=0.93

* Saturday, 18 August 2007 - Total=950, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	1	6	2	5	28	178	130	64	60	54	58	36	41	63	34	32	22	49	17	16	12	30	7	
0	1	4	1	2	1	26	41	20	18	10	13	10	4	9	12	7	7	11	4	3	3	4	1	2
4	0	1	0	0	4	40	28	16	16	16	14	9	12	19	6	7	5	11	6	2	5	4	3	0
1	0	0	1	1	10	42	30	12	16	16	14	6	12	24	5	10	6	10	5	4	0	14	2	0
0	0	1	0	2	13	70	31	16	10	12	17	11	13	11	11	8	4	17	2	7	4	8	1	0

AM Peak 0615 - 0715 (193), AM PHF=0.69 PM Peak 1415 - 1515 (66), PM PHF=0.69

* Sunday, 19 August 2007 - Total=522, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	3	2	2	2	15	98	51	23	22	15	14	21	19	37	15	25	27	55	22	15	6	24	7	
2	1	1	1	0	1	12	18	2	6	2	4	6	8	7	6	4	5	10	12	5	1	4	2	1
0	1	1	0	0	1	23	15	12	4	1	4	7	8	10	2	11	8	15	8	2	1	4	2	0
0	0	0	0	2	6	25	16	6	7	7	3	5	2	7	3	5	10	15	2	6	2	10	0	2
0	1	0	1	0	7	38	2	3	5	5	3	3	1	13	4	5	4	15	0	2	2	6	3	0

AM Peak 0615 - 0715 (104), AM PHF=0.68 PM Peak 1815 - 1915 (57), PM PHF=0.95

* Monday, 20 August 2007 - Total=2207, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	0	3	1	4	59	407	444	169	132	119	136	119	121	136	93	72	45	65	15	15	13	28	8	
1	0	2	0	0	6	56	118	72	32	27	30	34	25	28	16	17	15	15	4	6	3	2	1	1
0	0	0	1	0	1	88	120	46	25	34	29	36	28	37	31	16	10	16	3	2	5	7	4	1
2	0	0	0	3	20	108	106	28	46	28	43	24	25	43	27	28	10	15	1	4	3	10	1	2
0	0	1	0	1	32	155	100	23	29	30	34	25	43	28	19	11	10	19	7	3	2	9	2	0

AM Peak 0630 - 0730 (501), AM PHF=0.81 PM Peak 1345 - 1445 (151), PM PHF=0.88

* Tuesday, 21 August 2007 - Total=1946, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	1	1	3	3	50	379	436	209	126	153	158	150	159	114	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	3	46	129	75	37	41	38	40	37	25	0	0	0	0	0	0	0	0	0	0
1	1	1	0	1	3	85	113	55	22	38	36	47	40	35	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	14	106	105	41	29	24	47	40	42	41	0	0	0	0	0	0	0	0	0	0
0	0	0	3	2	30	142	89	38	38	50	37	23	40	13	0	0	0	0	0	0	0	0	0	0

AM Peak 0630 - 0730 (490), AM PHF=0.86 PM Peak 1300 - 1400 (159), PM PHF=0.95

* Wednesday, 22 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Thursday, 23 August 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-

AM Peak 0000 - 0100 (0), AM PHF=1.00

APPENDIX C

VEHICLE COUNTS
(SOUTH BOUND)

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-82 -- English (ENT)

Datasets:

Site:	**[Point Lisas Atlantic] Atlantic**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Pacific_Avenue_23Aug2007.ECO (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16869 / 33295 (50.67%)

* Thursday, 09 August 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0

* Friday, 10 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Saturday, 11 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Sunday, 12 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Monday, 13 August 2007 - Total=1778, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	0	0	0	0	20	173	182	145	131	271	419	188	91	86	21	11	9	31	
0	0	0	0	0	0	0	0	0	0	0	46	56	36	27	48	109	71	24	29	11	3	1	11	5
0	0	0	0	0	0	0	0	0	0	0	34	36	34	39	59	92	44	25	23	3	2	0	12	1
0	0	0	0	0	0	0	0	0	0	0	41	43	41	22	88	136	44	24	22	5	4	2	4	1
0	0	0	0	0	0	0	0	0	0	20	52	47	34	43	76	82	29	18	12	2	2	6	4	0

AM Peak 1145 - 1245 (187), AM PHF=0.83 PM Peak 1600 - 1700 (419), PM PHF=0.77

* Tuesday, 14 August 2007 - Total=2470, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
7	2	2	0	2	18	90	208	128	141	131	191	154	126	167	266	372	179	88	87	39	23	15	34	
5	0	1	0	1	1	12	55	41	27	33	56	37	36	53	52	114	76	36	33	8	4	3	20	4
1	1	0	0	1	0	17	54	27	40	31	45	41	30	32	56	74	39	15	25	9	8	5	10	1
1	1	1	0	0	3	28	60	25	36	33	36	37	32	36	78	112	42	17	15	15	3	2	1	3
0	0	0	0	0	14	33	39	35	38	34	54	39	28	46	80	72	22	20	14	7	8	5	3	2

AM Peak 0700 - 0800 (208), AM PHF=0.87 PM Peak 1545 - 1645 (380), PM PHF=0.83

* Wednesday, 15 August 2007 - Total=2654, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
10	3	1	1	7	17	111	210	136	128	141	190	156	159	179	302	423	213	84	83	28	18	23	31	
4	0	1	1	0	1	14	64	44	22	43	40	48	39	43	52	129	84	15	29	10	5	6	8	5
1	0	0	0	3	1	22	53	38	43	32	38	37	27	53	80	74	40	20	29	8	2	7	17	1
3	2	0	0	1	3	31	40	30	30	33	45	33	45	40	92	145	51	23	16	3	2	3	2	1
2	1	0	0	3	12	44	53	24	33	33	67	38	48	43	78	75	38	26	9	7	9	7	4	0

AM Peak 0700 - 0800 (210), AM PHF=0.82 PM Peak 1545 - 1645 (426), PM PHF=0.73

* Thursday, 16 August 2007 - Total=2504, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
7	2	0	0	3	18	104	196	106	132	137	167	164	166	156	286	379	195	89	63	40	16	27	51	
5	0	0	0	0	1	14	42	33	31	39	36	48	42	45	62	101	66	24	28	12	5	12	22	4
1	1	0	0	0	2	19	60	23	38	27	42	44	48	42	60	85	46	15	14	10	8	4	12	1
1	0	0	0	0	3	32	47	26	28	44	39	35	35	30	95	122	55	25	10	10	1	6	9	0
0	1	0	0	3	12	39	47	24	35	27	50	37	41	39	69	71	28	25	11	8	2	5	8	2

AM Peak 0700 - 0800 (196), AM PHF=0.82 PM Peak 1600 - 1700 (379), PM PHF=0.78

* Friday, 17 August 2007 - Total=2477, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
7	4	1	2	4	15	94	184	123	145	149	184	174	158	202	311	336	143	74	70	26	26	15	30	
4	1	0	0	0	3	16	39	37	40	48	46	48	35	49	62	102	42	23	23	7	6	3	16	5
1	1	1	0	1	1	17	49	27	36	24	38	43	47	50	54	85	35	15	24	8	8	5	7	0
0	1	0	1	2	3	20	40	34	31	39	42	35	35	44	111	89	37	18	10	3	8	5	4	1
2	1	0	1	1	8	41	56	25	38	38	58	48	41	59	84	60	29	18	13	8	4	2	3	1

AM Peak 1130 - 1230 (191), AM PHF=0.82 PM Peak 1530 - 1630 (382), PM PHF=0.86

* Saturday, 18 August 2007 - Total=938, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
7	2	7	2	1	11	49	97	67	52	71	71	57	48	56	106	36	42	35	49	20	19	11	22	
5	0	7	1	0	0	7	34	17	16	17	15	17	9	9	29	12	9	8	17	7	7	3	4	1
0	1	0	0	0	1	8	22	17	17	16	19	13	12	16	24	8	15	9	12	4	3	1	8	1
1	0	0	0	0	3	12	20	16	7	18	14	11	14	18	38	8	12	8	8	2	4	5	8	1
1	1	0	1	1	7	22	21	17	12	20	23	16	13	13	15	8	6	10	12	7	5	2	2	0

AM Peak 0645 - 0745 (98), AM PHF=0.72 PM Peak 1500 - 1600 (106), PM PHF=0.70

* Sunday, 19 August 2007 - Total=473, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**4**	**3**	**1**	**4**	**8**	**34**	**61**	**12**	**14**	**28**	**23**	**18**	**18**	**16**	**49**	**20**	**24**	**38**	**35**	**19**	**5**	**10**	**26**	
1	0	3	0	0	1	7	**20**	3	3	7	11	6	6	2	**15**	3	3	11	18	6	2	3	8	1
1	2	0	1	2	3	7	**26**	5	5	8	6	2	6	3	**18**	9	3	9	9	6	0	4	13	1
1	0	0	0	1	1	9	**12**	3	4	7	6	7	4	5	**10**	2	9	8	6	4	3	1	3	0
0	2	0	0	1	3	**11**	3	1	2	6	0	3	2	**6**	6	6	9	10	2	3	0	2	2	1

AM Peak 0645 - 0745 (69), AM PHF=0.66 PM Peak 1445 - 1545 (49), PM PHF=0.68

* Monday, 20 August 2007 - Total=2190, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**6**	**1**	**0**	**4**	**17**	**84**	**207**	**114**	**102**	**148**	**156**	**110**	**105**	**137**	**269**	**344**	**154**	**85**	**55**	**24**	**17**	**15**	**33**	
1	0	0	0	1	1	13	**42**	35	27	30	33	35	17	44	47	**107**	62	22	27	9	2	5	11	3
1	1	0	0	3	1	15	**55**	34	22	44	39	27	20	31	56	**84**	40	22	14	7	3	2	12	1
0	2	0	0	0	3	22	**62**	22	17	39	34	22	33	31	**94**	91	33	16	8	6	1	1	6	1
1	3	1	0	0	12	34	**48**	23	36	35	50	26	35	31	**72**	62	19	25	6	2	11	7	4	0

AM Peak 0700 - 0800 (207), AM PHF=0.83 PM Peak 1530 - 1630 (357), PM PHF=0.83

* Tuesday, 21 August 2007 - Total=1385, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	**1**	**2**	**2**	**4**	**22**	**95**	**198**	**133**	**141**	**156**	**180**	**169**	**148**	**129**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
3	1	1	0	2	2	12	**51**	36	31	29	49	**44**	35	38	0	0	0	0	0	0	0	0	0	0
1	0	1	0	0	2	21	**49**	33	43	34	43	**44**	38	30	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	5	22	**54**	28	41	48	49	**37**	32	47	0	0	0	0	0	0	0	0	0	0
0	0	0	2	1	13	40	**44**	36	26	45	39	**44**	43	14	0	0	0	0	0	0	0	0	0	0

AM Peak 0700 - 0800 (198), AM PHF=0.92 PM Peak 1200 - 1300 (169), PM PHF=0.96

* Wednesday, 22 August 2007 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Thursday, 23 August 2007 - Total=0 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-

AM Peak 0000 - 0100 (0), AM PHF=1.00

APPENDIX D

DAILY CLASSES
(NORTH BOUND)

MetroCount Traffic Executive
Daily Classes

DailyClass-78 -- English (ENT)

Datasets:

Site:	**[Point Lisas Atlantic] Atlantic**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Pacific_Avenue_23Aug2007.ECO (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16376 / 33295 (49.18%)

Daily Classes

DailyClass-78
Site: Point Lisas Atlantic.0SN
Description: **Atlantic**
Filter time: **14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 06 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekdays	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekend	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-78

Site:	Point Lisas Atlantic.0SN
Description:	**Atlantic**
Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 13 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	1	882	6	37	40	2	0	5	14	4	1	0	992
(%)	0.1	88.9	0.6	3.7	4.0	0.2	0.0	0.5	1.4	0.4	0.1	0.0	
Tue	6	2150	20	112	63	8	2	10	25	12	0	0	2408
(%)	0.2	89.3	0.8	4.7	2.6	0.3	0.1	0.4	1.0	0.5	0.0	0.0	
Wed	6	2263	14	119	78	14	0	16	32	18	1	1	2562
(%)	0.2	88.3	0.5	4.6	3.0	0.5	0.0	0.6	1.2	0.7	0.0	0.0	
Thu	4	2189	10	104	66	9	0	15	19	11	1	0	2428
(%)	0.2	90.2	0.4	4.3	2.7	0.4	0.0	0.6	0.8	0.5	0.0	0.0	
Fri	5	2077	10	130	74	3	0	21	31	10	0	0	2361
(%)	0.2	88.0	0.4	5.5	3.1	0.1	0.0	0.9	1.3	0.4	0.0	0.0	
Sat	1	852	5	27	38	3	0	6	13	4	1	0	950
(%)	0.1	89.7	0.5	2.8	4.0	0.3	0.0	0.6	1.4	0.4	0.1	0.0	
Sun	0	497	1	9	9	1	0	1	4	0	0	0	522
(%)	0.0	95.2	0.2	1.7	1.7	0.2	0.0	0.2	0.8	0.0	0.0	0.0	

Average daily volume

Entire week													
	3	1558	9	76	52	5	0	10	19	8	0	0	1746
(%)	0.2	89.2	0.5	4.4	3.0	0.3	0.0	0.6	1.1	0.5	0.0	0.0	
Weekdays													
	4	1912	12	100	64	7	0	13	24	11	0	0	2150
(%)	0.2	88.9	0.6	4.7	3.0	0.3	0.0	0.6	1.1	0.5	0.0	0.0	
Weekend													
	0	674	3	18	23	2	0	3	8	2	0	0	736
(%)	0.0	91.6	0.4	2.4	3.1	0.3	0.0	0.4	1.1	0.3	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-78

Site:	Point Lisas Atlantic.0SN
Description:	**Atlantic**
Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme:	Vehicle classification (ARX)
Filter:	Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(N) Sp(10,160) Headway(>0)

Monday, 20 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	5	1968	15	107	49	6	2	15	30	10	0	0	2207
(%)	0.2	89.2	0.7	4.8	2.2	0.3	0.1	0.7	1.4	0.5	0.0	0.0	
Tue	3	1759	13	77	46	7	0	8	25	7	1	0	1946
(%)	0.2	90.4	0.7	4.0	2.4	0.4	0.0	0.4	1.3	0.4	0.1	0.0	
Wed	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	2	1242	9	61	31	4	0	7	18	5	0	0	1384
(%)	0.1	89.7	0.7	4.4	2.2	0.3	0.0	0.5	1.3	0.4	0.0	0.0	
Weekdays													
	2	1242	9	61	31	4	0	7	18	5	0	0	1384
(%)	0.1	89.7	0.7	4.4	2.2	0.3	0.0	0.5	1.3	0.4	0.0	0.0	

Weekend No complete days.

*** - Incomplete**

APPENDIX E

DAILY CLASSES
(SOUTH BOUND)

MetroCount Traffic Executive
Daily Classes

DailyClass-79 -- English (ENT)

Datasets:

Site:	**[Point Lisas Atlantic] Atlantic**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Pacific_Avenue_23Aug2007.ECO (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16869 / 33295 (50.67%)

Daily Classes

DailyClass-79
Site: Point Lisas Atlantic.0SN
Description: **Atlantic**
Filter time: **14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 06 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekdays	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Weekend	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-79
Site: Point Lisas Atlantic.0SN
Description: **Atlantic**
Filter time: **14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 13 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	4	1558	1	131	51	3	0	15	11	4	0	0	1778
(%)	0.2	87.6	0.1	7.4	2.9	0.2	0.0	0.8	0.6	0.2	0.0	0.0	
Tue	5	2160	4	175	64	7	1	22	27	5	0	0	2470
(%)	0.2	87.4	0.2	7.1	2.6	0.3	0.0	0.9	1.1	0.2	0.0	0.0	
Wed	7	2296	6	190	68	17	2	36	25	7	0	0	2654
(%)	0.3	86.5	0.2	7.2	2.6	0.6	0.1	1.4	0.9	0.3	0.0	0.0	
Thu	3	2169	4	202	79	3	0	16	23	4	1	0	2504
(%)	0.1	86.6	0.2	8.1	3.2	0.1	0.0	0.6	0.9	0.2	0.0	0.0	
Fri	3	2110	6	214	57	16	1	33	29	7	0	1	2477
(%)	0.1	85.2	0.2	8.6	2.3	0.6	0.0	1.3	1.2	0.3	0.0	0.0	
Sat	1	784	0	71	41	2	1	26	8	4	0	0	938
(%)	0.1	83.6	0.0	7.6	4.4	0.2	0.1	2.8	0.9	0.4	0.0	0.0	
Sun	0	439	1	20	9	1	0	0	3	0	0	0	473
(%)	0.0	92.8	0.2	4.2	1.9	0.2	0.0	0.0	0.6	0.0	0.0	0.0	

Average daily volume

Entire week													
	3	1645	3	143	52	7	0	21	18	4	0	0	1899
(%)	0.2	86.6	0.2	7.5	2.7	0.4	0.0	1.1	0.9	0.2	0.0	0.0	
Weekdays													
	4	2058	4	182	63	9	0	24	23	5	0	0	2376
(%)	0.2	86.6	0.2	7.7	2.7	0.4	0.0	1.0	1.0	0.2	0.0	0.0	
Weekend													
	0	611	0	45	25	1	0	13	5	2	0	0	705
(%)	0.0	86.7	0.0	6.4	3.5	0.1	0.0	1.8	0.7	0.3	0.0	0.0	

* - Incomplete

Daily Classes

DailyClass-79
Site: Point Lisas Atlantic.0SN
Description: **Atlantic**
Filter time: **14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Monday, 20 August 2007

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	7	1897	3	182	46	6	2	12	28	6	1	0	2190
(%)	0.3	86.6	0.1	8.3	2.1	0.3	0.1	0.5	1.3	0.3	0.0	0.0	
Tue	3	1148	0	131	36	7	1	23	30	5	0	1	1385
(%)	0.2	82.9	0.0	9.5	2.6	0.5	0.1	1.7	2.2	0.4	0.0	0.1	
Wed	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average daily volume

Entire week													
	3	1015	1	104	27	4	1	11	19	3	0	0	1191
(%)	0.3	85.2	0.1	8.7	2.3	0.3	0.1	0.9	1.6	0.3	0.0	0.0	
Weekdays													
	3	1015	1	104	27	4	1	11	19	3	0	0	1191
(%)	0.3	85.2	0.1	8.7	2.3	0.3	0.1	0.9	1.6	0.3	0.0	0.0	

Weekend No complete days.

*** - Incomplete**

APPENDIX F

CLASS SPEED MATRIX
(NORTH BOUND)

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-80 -- English (ENT)

Datasets:

Site:	**[Point Lisas Atlantic] Atlantic**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Pacific_Avenue_23Aug2007.ECO (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, West (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16376 / 33295 (49.18%)

Class Speed Matrix

ClassMatrix-80
Site: Point Lisas Atlantic.0SN
Description: **Atlantic**
Filter time: **14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NW) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	6	96	.	26	18	2	1	2	2	2	1	.	156	1.0%
20 - 30	6	677	8	130	99	12	1	15	45	20	2	.	1015	6.2%
30 - 40	5	2383	33	255	164	14	.	47	71	30	2	1	3005	18.4%
40 - 50	2	5321	40	219	137	24	1	24	64	21	.	.	5853	35.7%
50 - 60	2	4536	12	80	39	1	1	8	9	3	.	.	4691	28.6%
60 - 70	5	1307	1	10	6	.	.	1	2	.	.	.	1332	8.1%
70 - 80	2	277	.	1	.	.	.	.	.	.	.	.	280	1.7%
80 - 90	3	35	.	.	.	.	.	.	.	.	.	.	38	0.2%
90 - 100	.	4	.	.	.	.	.	.	.	.	.	.	4	0.0%
100 - 110	.	1	.	.	.	.	.	.	.	.	.	.	1	0.0%
110 - 120	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
120 - 130	.	.	.	1	.	.	.	.	.	.	.	.	1	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	31	14637	94	722	463	53	4	97	193	76	5	1	16376	
	0.2%	89.4%	0.6%	4.4%	2.8%	0.3%	0.0%	0.6%	1.2%	0.5%	0.0%	0.0%		

APPENDIX G

CLASS SPEED MATRIX
(SOUTH BOUND)

MetroCount Traffic Executive
Class Speed Matrix

ClassMatrix-81 -- English (ENT)

Datasets:

Site:	**[Point Lisas Atlantic] Atlantic**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007
File:	C:\Program Files\MetroCount v316\User\Data\Pacific_Avenue_23Aug2007.ECO (Plus)
Identifier:	N498S67K MC56-L4 [MC55] (c)Microcom 19Sep03
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16869 / 33295 (50.67%)

Class Speed Matrix

ClassMatrix-81
Site: Point Lisas Atlantic.0SN
Description: **Atlantic**
Filter time: **14:00 Thursday, 09 August 2007 => 14:00 Thursday, 23 August 2007**
Scheme: Vehicle classification (ARX)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(S) Sp(10,160) Headway(>0)

Speed (km/h)	Class 1	2	3	4	5	6	7	8	9	10	11	12	Speed Totals	
10 - 20	3	63	.	11	8	5	.	.	.	.	.	.	90	0.5%
20 - 30	5	327	2	81	36	4	1	10	13	4	.	.	483	2.9%
30 - 40	9	1306	5	274	79	16	2	24	61	9	1	.	1786	10.6%
40 - 50	7	3267	12	389	161	17	4	47	69	17	1	2	3993	23.7%
50 - 60	6	4676	3	316	102	16	1	53	31	6	.	.	5210	30.9%
60 - 70	1	3180	1	161	45	4	.	30	8	6	.	.	3436	20.4%
70 - 80	1	1249	1	65	13	.	.	14	2	.	.	.	1345	8.0%
80 - 90	.	376	1	11	7	.	.	4	.	.	.	.	399	2.4%
90 - 100	.	89	.	7	.	.	.	1	.	.	.	.	97	0.6%
100 - 110	1	22	.	.	.	.	.	.	.	.	.	.	23	0.1%
110 - 120	.	5	.	1	.	.	.	.	.	.	.	.	6	0.0%
120 - 130	.	1	.	.	.	.	.	.	.	.	.	.	1	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	33	14561	25	1316	451	62	8	183	184	42	2	2	16869	
	0.2%	86.3%	0.1%	7.8%	2.7%	0.4%	0.0%	1.1%	1.1%	0.2%	0.0%	0.0%		

TRAFFIC COUNT DATA REPORT

FOR

SOUTHERN MAIN ROAD POINT LISAS

FOR

CARASIL

AUGUST 2007

Trintoplan Consultants Limited
Orange Grove Road, Tacarigua
P.O. Box 1262, Port of Spain.
TRINIDAD & TOBAGO W.I.

TRINTOPLAN CONSULTANTS LIMITED

Engineers ~ Planners ~ Architects

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Telephone No. : (868) 640-1981/1985
Fax : (868) 640-0708
E-Mail – ttplan@tstt.net.tt

August 24, 2007 File: 4143

Carasil
3 Pelham Street
PORT OF SPAIN

Attention: Mr. Roger Moore

Dear Sir,

RE: TRAFFIC COUNTS FOR THE POINT LISAS AREA ON THE SOUTHERN MAIN ROAD

We are pleased to submit four (4) copies of the automated traffic count report for the above captioned project.

We trust that the contents of this report meets with your requirements and we are here at your convenience should you require any further discussions or clarifications.

Yours respectfully,

Saffraz A Muhammad

Saffraz A. Muhammad
Civil Engineer, Geotechnical Department

Traffic Modelling Output

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

```
Analyst:              Larry O'Rourke
Agency/Co.:           ICF
Date Performed:       10/9/2007
Analysis Time Period: September
Intersection:         Southern Main Road
Jurisdiction:
Units: U. S. Customary
Analysis Year:        2007
Project ID:
East/West Street:
North/South Street:
Intersection Orientation: NS                 Study period (hrs):  0.25
```

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	968	45	45	839	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	968	45	45	839	0
Percent Heavy Vehicles	5	--	--	5	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	8	0	0	8	0
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	8	0	0	8	0
Percent Heavy Vehicles	5	5	5	5	5	5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	0	45		8			8	
C(m) (vph)	783	673		57			56	
v/c	0.00	0.07		0.14			0.14	
95% queue length	0.00	0.21		0.46			0.46	
Control Delay	9.6	10.7		78.2			79.7	
LOS	A	B		F			F	
Approach Delay				78.2			79.7	
Approach LOS				F			F	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Larry O'Rourke
Agency/Co.: ICF
Date Performed: 10/9/2007
Analysis Time Period: September
Intersection: Southern Main Road
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2007
Project ID:
East/West Street:
North/South Street:
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	968	45	45	839	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	242	11	11	210	0
Hourly Flow Rate, HFR	0	968	45	45	839	0
Percent Heavy Vehicles	5	--	--	5	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal?		No			No	

Minor Street Movements	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	8	0	0	8	0
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Peak-15 Minute Volume	0	2	0	0	2	0
Hourly Flow Rate, HFR	0	8	0	0	8	0
Percent Heavy Vehicles	5	5	5	5	5	5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		No /
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0
Lane Width (ft)	12.0	12.0	12.0	12.0
Walking Speed (ft/sec)	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	0

Upstream Signal Data

	Prog. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal feet
S2 Left-Turn							
Through							
S5 Left-Turn							
Through							

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
Shared ln volume, major th vehicles:	968	839
Shared ln volume, major rt vehicles:	45	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement		1	4	7	8	9	10	11	12
		L	L	L	T	R	L	T	R
t(c,base)		4.1	4.1	7.1	6.5	6.2	7.1	6.5	6.2
t(c,hv)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)		5	5	5	5	5	5	5	5
t(c,g)				0.20	0.20	0.10	0.20	0.20	0.10
Grade/100				0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
t(c,T):	1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c)	1-stage	4.2	4.2	7.2	6.6	6.3	7.2	6.6	6.3
	2-stage								

Follow-Up Time Calculations

Movement	1	4	7	8	9	10	11	12
	L	L	L	T	R	L	T	R
t(f,base)	2.20	2.20	3.50	4.00	3.30	3.50	4.00	3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	5	5	5	5	5	5	5	5
t(f)	2.2	2.2	3.5	4.0	3.3	3.5	4.0	3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
V prog				
Total Saturation Flow Rate, s (vph)				
Arrival Type				
Effective Green, g (sec)				
Cycle Length, C (sec)				
Rp (from Exhibit 16-11)				
Proportion vehicles arriving on green P				
g(q1)				
g(q2)				
g(q)				

Computation 2-Proportion of TWSC Intersection Time blocked

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
alpha				
beta				
Travel time, t(a) (sec)				
Smoothing Factor, F				
Proportion of conflicting flow, f				
Max platooned flow, V(c,max)				
Min platooned flow, V(c,min)				
Duration of blocked period, t(p)				
Proportion time blocked, p		0.000		0.000

Computation 3-Platoon Event Periods **Result**

p(2)	0.000
p(5)	0.000
p(dom)	
p(subo)	
Constrained or unconstrained?	

Proportion unblocked for minor movements, p(x)	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Two-Stage Process Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

Computation 4 and 5
Single-Stage Process

Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
V c,x	839	1013	1923	1919	990	1923	1942	839
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process

	7		8		10		11	
	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)								
s	1500		1500		1500		1500	
P(x)								
V(c,u,x)								
C(r,x)								
C(plat,x)								

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	990	839
Potential Capacity	295	361
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	295	361
Probability of Queue free St.	1.00	1.00

Step 2: LT from Major St.	4	1
Conflicting Flows	1013	839
Potential Capacity	673	783
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	673	783
Probability of Queue free St.	0.93	1.00
Maj L-Shared Prob Q free St.	0.87	1.00

Step 3: TH from Minor St.	8	11
Conflicting Flows	1919	1942
Potential Capacity	66	64
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.87	0.87
Movement Capacity	57	56
Probability of Queue free St.	0.86	0.86
Step 4: LT from Minor St.	7	10
Conflicting Flows	1923	1923
Potential Capacity	50	50
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.74	0.75
Maj. L, Min T Adj. Imp Factor.	0.80	0.80
Cap. Adj. factor due to Impeding mvmnt	0.80	0.80
Movement Capacity	40	40

Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance

Step 3: TH from Minor St.	8	11
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Probability of Queue free St.		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 3 - Single Stage		
Conflicting Flows	1919	1942
Potential Capacity	66	64
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	0.87	0.87
Movement Capacity	57	56
Result for 2 stage process:		
a		
y		
C t	57	56
Probability of Queue free St.	0.86	0.86
Step 4: LT from Minor St.	7	10
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		
Part 2 - Second Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
Cap. Adj. factor due to Impeding mvmnt		
Movement Capacity		

Part 3 - Single Stage		
Conflicting Flows	1923	1923
Potential Capacity	50	50
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.74	0.75
Maj. L, Min T Adj. Imp Factor.	0.80	0.80
Cap. Adj. factor due to Impeding mvmnt	0.80	0.80
Movement Capacity	40	40
Results for Two-stage process:		
a		
y		
C t	40	40

Worksheet 8-Shared Lane Calculations

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (vph)	0	8	0	0	8	0
Movement Capacity (vph)	40	57	295	40	56	361
Shared Lane Capacity (vph)		57			56	

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
C sep	40	57	295	40	56	361
Volume	0	8	0	0	8	0
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						
n max						
C sh		57			56	
SUM C sep						
n						
C act						

Worksheet 10-Delay, Queue Length, and Level of Service

Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	0	45		8			8	
C(m) (vph)	783	673		57			56	
v/c	0.00	0.07		0.14			0.14	
95% queue length	0.00	0.21		0.46			0.46	
Control Delay	9.6	10.7		78.2			79.7	
LOS	A	B		F			F	
Approach Delay				78.2			79.7	
Approach LOS				F			F	

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	0.93
v(il), Volume for stream 2 or 5	968	839
v(i2), Volume for stream 3 or 6	45	0
s(il), Saturation flow rate for stream 2 or 5	1700	1700
s(i2), Saturation flow rate for stream 3 or 6	1700	1700
P*(oj)	1.00	0.87
d(M,LT), Delay for stream 1 or 4	9.6	10.7
N, Number of major street through lanes	1	1
d(rank,1)		
Delay for stream 2 or 5	0.0	1.4

Flora and Fauna

Document
Biological Reconnaissance Survey Report
Flora and Fauna Species Identified in the Immediate Project Area
CariSal Point Lisas Development Plot of Wetland Boundary Report

JARIC Environment Safety and Health Services Ltd

CariSal Point Lisas Development Biological Reconnaissance Survey Report

Submitted to: CariSal Limited

Lead Consultants: Dr Michael Otham, Graham White and Janice Smith

Date submitted: 15th November 2007

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I EXECUTIVE SUMMARY

Jaric Environment Safety and Health Services (Jaric ESH) was contracted by CariSal Limited to conduct a biological reconnaissance survey of the site for proposed development located in Point Lisas.

The main objectives of the project was to Carry out a reconnaissance survey of the entire project site(s), including pipeline rights-of-way (ROW). Identify the major vegetative community types present.

- Identify and list the 8-12 predominant or most distinguishing floral species in each designated vegetative community type.

- Determine whether any of the vegetative communities or the site/ROW in general meet the characteristics for areas that typically provide habitat, feeding areas, breeding areas or otherwise support endangered species, including seasonal or migratory species. If so, list the vegetative communities and the endangered species they might support;

- Determine whether any of the vegetative communities or the site/ROW in general meet the characteristics that typically provide habitat, feeding areas, breeding areas or otherwise support commercially or culturally important species.

- Determine whether any portion of the project site/ROW meets the definition of wetland as defined in the National Policy and Programmes on Wetland Conservation for Trinidad and Tobago, and pursuant regulations.

- Identify and list any/all observed wildlife:

- Assess the importance of the present vegetative cover and topography to the flow regime or water quality of adjacent and nearby surface water bodies.

- Determine whether any of the surface water bodies likely to be affected by activity on the project site/ROW meet the characteristics that typically provide habitat, feeding areas, breeding areas or otherwise support endangered or commercially or culturally important species (including, for example, the Cascadura (Hoplosternum littorale).

It was found that the site is highly disturbed but does contain seven species of uncommon bird species which include Wilson's Snipe, Green-rumped Parrotlet, White-tailed Goldenthroat, Bran-coloured Flycatcher, Masked Yellowthroat, Saffron Finch and Common Waxbill. None of the plant or animal species observed are considered endangered, threatened or rare in Trinidad under the Conservation of Wildlife Bill of 2003 or the Sensitive Species Rules.

II PROJECT SETTING

The CariSal proposed for development is an area of 12 ha plus two pipeline ROWs situated a little over 1km from the coastal mangroves at Pt Lisas, on coastal flat land at the base of the rolling hills of the western Central Range. The site is far enough away from the coast to avoid a

direct marine influence. Little or no natural vegetation or recovering degraded vegetation noted within 2 km of the site.

At the end of the last ice-age was dry deciduous forest with riparian evergreen seasonal strips and marsh vegetation in areas subject to inundation. Mangroves probably did not extend into the main area but are likely to have once occurred in at least part of the southern ROW. Nelson (2005) classifies as a dry forest zone. In pre-Columbian times probably a mix of dry forest and savanna as Amerindians increased fire frequency. Riparian and marsh zones probably unaffected. Mallet Map and other historical records indicate a mixture of dry forest and savanna. By the start of the 1800s much of the area had been converted to intensive sugarcane cultivation. It is likely the project area was cleared of natural vegetation and cultivated for sugar cane at this time. It was finally abandoned in 2006. There is very little published literature concerning the non-mangrove vegetation in the Pt Lisas area.

Plant Species of Conservation Concern

- Three species of plants endemic to Trinidad & Tobago are found in the dry forest ecosystem that formerly occurred in the area (Van Den Eynden et al 2007). They are: *Coccoloba nigrescens*; *Phoradrendron hartii* and *Xylosoma sanctae-annae* (Table 1). The vegetation survey specifically looked for these species or habitat thought to be suitable for these species.

Table 1. Plant species endemic to Trinidad & Tobago that have been collected or may have been collected in dry forest ecosystems and therefore may occur at the project site. From Van Den Eynden et al (2007).

Species	Conservation status (IUCN Red List Criteria) (Van Den Eynden et al 2007)	Conservation Action Group
Coccoloba nigrescens *Phoradendron hartii* *Xylosma sanctae-annae*	Vulnerable (VU B.1.a & b iii) Endangered (EN B.1.a & b iii) Endangered (EN B.1.a & b iii)	**Dry Forest Group** Survey for presence in protected areas and outside protected areas Ex-situ conservation (seed banking and/or cultivation) Establish dry forest protected area in Chagaramas or Chacachacare and investigate translocation to this area Research ecology of this species
Acalypha grisebachiana *Maytenus monticola* *Podocarpus trinitensis*	Least Concern (LC) Least Concern (LC) Least Concern (LC)	**Least Concern Group** Note in Environmental Impact Assessments
Aegiphila obovata *Eugenia cruegeri* *Werauhia broadwayi*	Near Threatened (NT) Near Threatened (NT) Endangered (EN B.2. a & b iii)	**Trinidad & Tobago Group** Survey for presence in other protected areas Note in Environmental Impact Assessments

II METHODOLOGY

The approach taken by Jaric ESH was basically to split the study into an identification of the fauna in the survey area and a vegetative survey. Site visits were conducted over the period 29th October to 12th November 2007.

Method for the Vegetation Survey

The vegetation communities in the 12.2 ha main site of the CariSal development were characterized in 33 2m x 2m quadrats arranged on three transects running north-south across the area (Fig 1). Within each quadrat all dominant vegetation species were recorded on an arbitrary dominance scale with 3 being the most dominant and 1 indicating presence of the species. Dominance was estimated by a qualitative combination of the numbers of individual species and its structural dominance. Species identifications were provided by the team parataxonomist Mr. Winston Johnson (Senior Technician at the National Herbarium of Trinidad and Tobago) although all identifications are not officially verified by the National Herbarium. All trees and extra species outside the quadrats encountered on the survey were also recorded separately. Vegetation communities on the pipeline ROWs were characterized in 23 plotless sample sites distributed systematically along the ROWs (Fig 2). Sample locations were chosen based on a plan of the proposed locations of the ROWs provided by CariSal, and all plant species in the vicinity of the sample location were recorded along with their dominance following the method given above.

The main site plots were qualitatively classified into different vegetation communities based on the presence or dominance of specific species chosen on the basis of their known ecological requirements. The eight most frequently occurring species in each vegetation community was calculated and used to characterize the community.

Figure 1. Locations of sample plots on the CariSal main site

To assess the efficacy of sampling a species accumulation curve was constructed for the main site and an estimated total number of species on the main site was calculated using a Michaelis Menten asymptotic species richness estimator (Colwell 2006).

Species accumulation curves were also constructed and total species estimates made for the pipeline ROW dataset. Using the classification of the plots into different vegetation communities and 2007 satellite imagery of the site downloaded from Google Earth, the spatial extent of the vegetation communities on the main site was mapped. Finally the communities on the main site were also compared to the definition of a wetland as given in the National wetlands programme for Trinidad and Tobago (National Wetlands Committee 2002).

Method for Fauna Identification

During the first visit emphasis was placed on assessing the bird and mammal fauna and identifying locations at which fish and amphibians may be present. Birds and other diurnal vertebrates were surveyed by slowly walking along the perimeter of the site and recording all species observed within or flying above the site. The path followed and time taken for conducting the survey is presented in Table 2. Where possible, individuals counted in one sector were not re-counted if observed within the following sector.

Table 2. Path followed and duration of conducting faunal survey during the site visit on 9th November 2007.

Sector	Grid Reference	Time	Description.
1	667674, 1147752 to 667654, 1147952	06:00-06:36	Abandoned sugarcane with small shrubs. Immediately to the east all vegetation cleared for pipe laying.
2	667654, 1147952 to 667852,1147954	06:36-06:44	Eastern end of site. Small wetland to the north of canal.
3	667852,1147954 to 667487, 1148048	06:44-07:15	Small area of wetland north of canal. Water level from 25-50 cm deep.
4	667487, 1148048 to 667290, 1147721	07:15-07:47	Western border of site. Vegetation tall and dense on elevated land. Flat areas flooded and swampy.
5	667290, 1147721 to 667600, 1147696	07:47-08:00	Paved road along southern boundary of site. Abandoned sugarcane with a few small trees.
6	667600, 1147696 to 667567,1147898	08:00-08:20	Abandoned sugarcane field. Ridges in field still evident. Soil surface dry. Vegetation 1m tall.
	South ROW	08:30-09:00	The ROW passes through mainly commercial lands. No significant natural vegetation or habitat except for a small wetland at the end of the southern ROW.
	North ROW	09:00-09:30	

Fish were sampled with a dip net (30cm diameter) at the northwest point where a small drainage canal exits the site. A resident farmer, adjacent to the site was questioned on the presence of fish and mammals. The farmer advised that a pond just northwest of the site was once stocked with Cascadura but during floods the fish escaped to the surrounding waterways.

Amphibians were surveyed during the second visit. Representative areas of the site were visited and species identified by their characteristic vocalisation. The ROW for the planned pipeline was followed and the general habitat and fauna observed were noted.

IV RESULTS AND DISCUSSION

Vegetation Survey

A total of 61 species were recorded from the CariSal main development site and 81 species were recorded from the pipeline ROWs. The difference in numbers of species reflects the greater diversity of habitats crossed by the ROWs and the greater variety of management regimes (from abandoned plots to regularly mown savannas). The extrapolation using the Michaelis Menten asymptotic method indicated that 76 species are likely to be present on the main site indicating the present survey recorded 80% of all species on the main site (Fig 4). The same extrapolation method showed that 120 species are likely to be present on the pipeline ROWs indicating the current survey recorded 68% of all species (Fig 5).

The vegetation of the main site was classified into four communities: permanent freshwater marsh; annual freshwater marsh; early successional stage upland; and early successional upland (bamboo dominated) (Fig 6). The different communities were classified based on species

Figure 2. Sample sites on the pipeline ROWs

composition. The distinguishing species of the vegetation communities are given in Table 3. The permanent marsh community was characterized by hydrophytes such as Cascadoux grass (*Leersia hexandra*) and the tall Marantaceae *Thalia* sp. This habitat is likely to provide a habitat for the economically and culturally important fish Cascadoux. The native Cascadoux grass is also an important food source for wetland birds in the southern United States and may be an important resource for neotropical migrants. The annual (or seasonal) freshwater marsh fringes the permanently inundated marsh and is dominated by the grasses *Urochloa mutica* (Para grass- a native of Africa) and *Fimbristylis meliacea* and the Ongaraceae species *Ludwigia erecta* and *Ludwigia sp.*. Para grass is an introduced plant used extensively for fodder for cattle. *Ludwigia erecta* a native plant species that has no recorded economic importance except as a weed of crop lands such as rice. However it is likely to have ecological importance (probably as a food source) due to its dominance of the wetland environment.

Table 3. Characteristic species of the different vegetation communities

Permanent Swamp	**Freq (%)**	**Annual Swamp**	**Freq (%)**	**Upland Early Successional**	**Freq (%)**
Leersia hexandra	100	*Urochloa mutica*	82	*Fimbristylis meliacea*	75
Torulinium odoratum	50	*Ludwigia erecta*	64	*Ischaemum rugosum*	65
Thalia	50	*Fimbristylis meliacea*	64	*Rottboelia sp*	50
Sphenochlea	50	*Ludwigia sp.*	55	*Aechynomene sensitiva*	40
Ludwigia erecta	50	*Pueraria phaseoloides*	45	*Paspalum fasciculatum*	35
		Sphenochlea sp.	36	*Solanum jamaicense*	30
		Ischaemum rugosum	36	*Panicum maximum*	30
		Caperonia palustris	36	*Hyptis sp.*	30

This freshwater marsh remnant may be the remains of a once more extensive system or it may be a small “exotic” ecosystem not normally found in the area. The balance of evidence points to the former rather than the latter with it occupying the position of a freshwater marsh positioned immediately behind a mangrove wetland as in the case of Nariva, Los Blanquizales and even Caroni swamps. If is the case then its ecological importance may be considerable as there is little habitat of this type left in the area. Wetlands to the west of the site are mainly mangrove or brackish swamp types and this was the only freshwater marsh sighted in the survey.

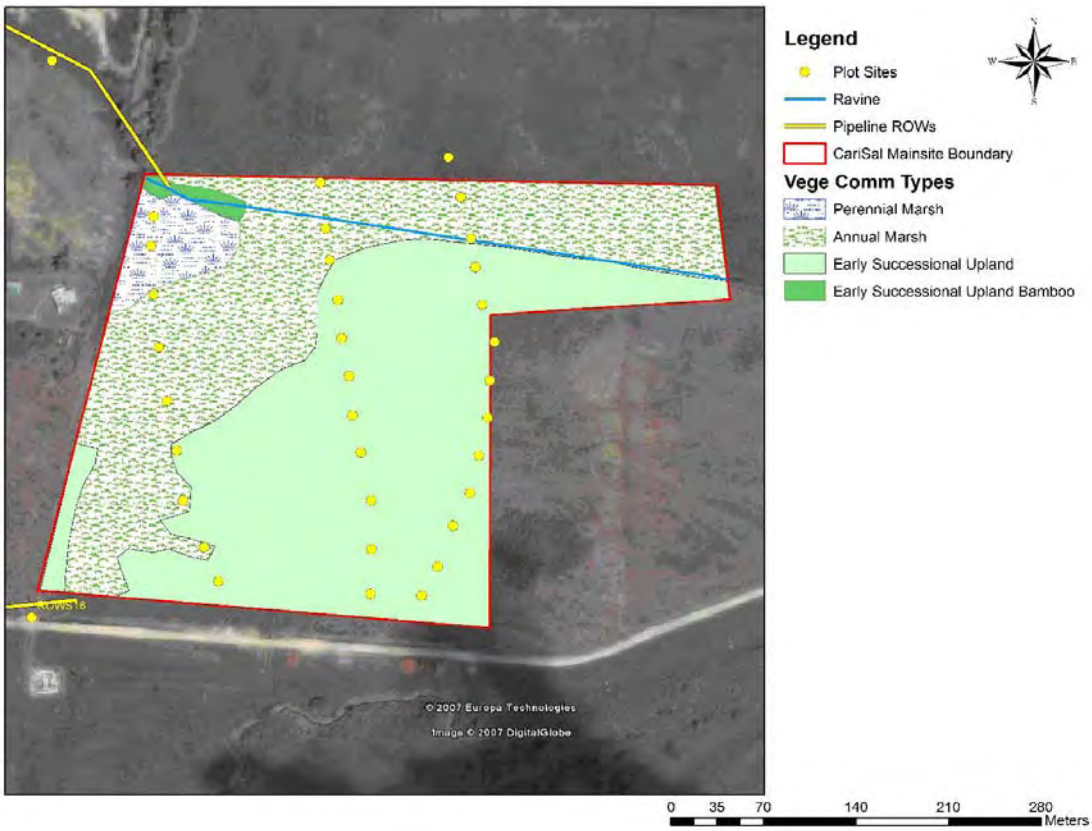

Figure 3. Plant vegetation communities

The early successional stage upland communities and the pipeline ROW communities are dominated by common weedy species and do not in themselves represent much economic or ecological value. However, the ecosystem may be important in supporting plants and animals in neighbouring wetland communities by providing food and retaining soil moisture.

The permanent and annual marsh vegetation communities on the main development site meet the broad definition of a wetland community as given by the National Wetlands Committee (2002). They are permanently or seasonally inundated with soils that become anaerobic and promote hydrophytes. They are dominated by herbaceous species of plants therefore they can be considered marsh communities. The communities provide economic benefits in terms of fodder provision and probably fish extraction. They probably also act as a filter and flood control for runoff along the main ravine cutting across the area from the east. If they are filled, and the ravine canalized there is likely to be an increased risk of flooding in receiving environments further to the west. They probably also provide ecological benefits for plants and animals possibly including neotropical migrant bird species. They may also act as a refuge or food supply for animals with a more restricted distribution in the dry season. It is suggested that plans be put in place to retain the benefits of this small wetland during the construction and running of the current development project. In particular, attention should be paid to any on-site feature such as an earth embankment immediately to the north and west of the permanent wetland or similar off-site feature on the pipeline ROW running from the NW corner of the main site. Such a feature is likely to be important in preserving the permanent wetland by impeding water flow and allowing

it to collect to form the wetland. Hydrological studies may need to be done to confirm this information.

On a similar note, the Environmental Management Authority should be aware of the potential risks to the permanent wetland on the main CariSal site from other developments adjacent to the CariSal site. The area to the north and north and east of the main CariSal site appears to be extensively flooded in the wet season and probably inputs a substantial amount of water into the wetland on the CariSal site. Hydrological studies will need to be done to confirm this, but filling in of this annual wetland to the north of the CariSal site would probably have negative effects on the CariSal permanent wetland. In addition the offsite drainage route from the NW of permanent wetland as described above should also be monitored in future developments as well in construction of any pipelines in the current development.

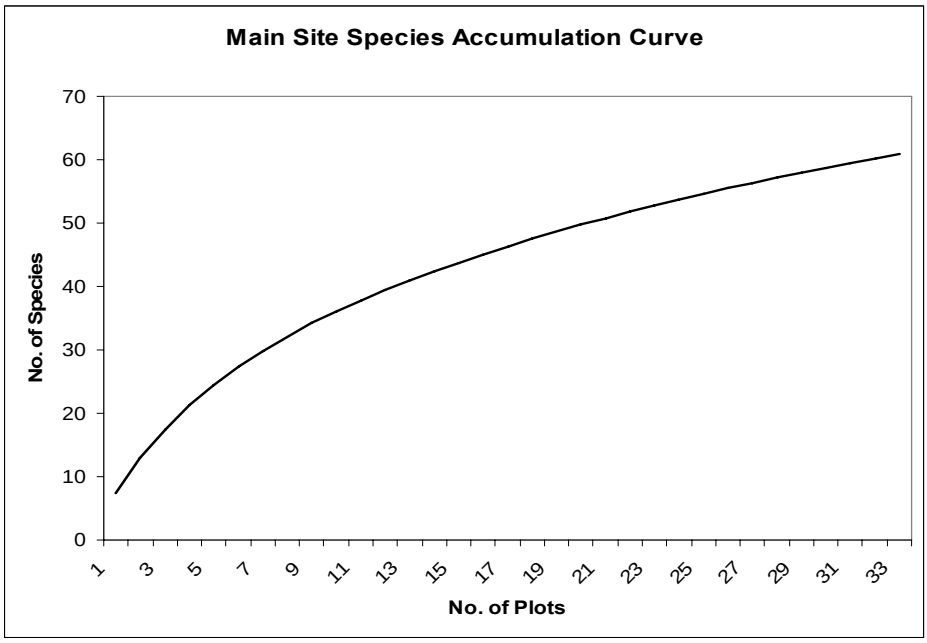

Figure 4. Main site species accumulation curve

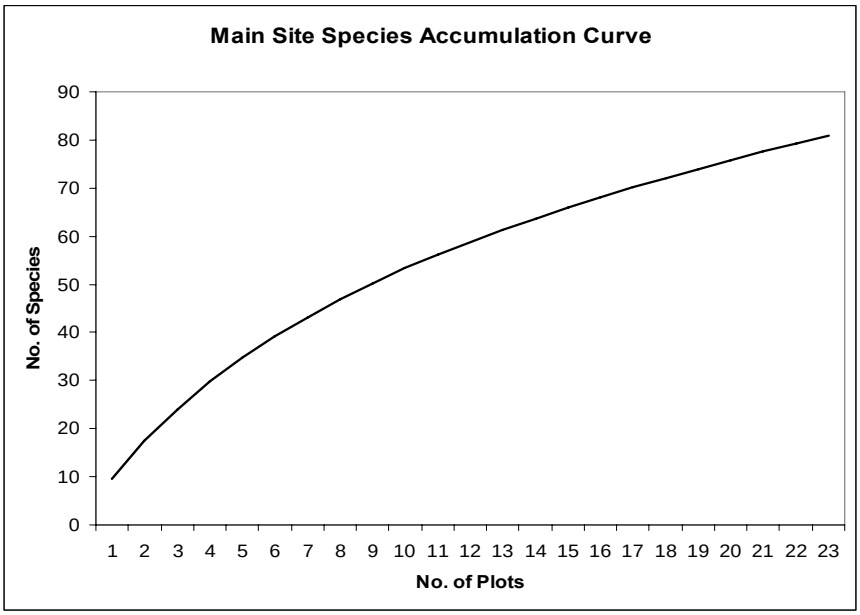

Figure 5. Pipeline ROW species accumulation curve

Fauna Survey

All species observed are listed in Tables 4 and 5, together with a few species which are likely to inhabit the site but which were not detected during the current survey. Nomenclature follows Phillip and Ramnarine (2001) for fish, Murphy (1997) for amphibians and reptiles, *Remsen et al.* (2007) for Birds and Alkins (1979) for mammals.

Table 4 Bird species observed during one site visit and their status and abundance in Trinidad.

Family	Species	Status	Abund	Sector							
				1	2	3	4	5	6	ROW	TOTAL
Pelicanidae	Brown Pelican, *Pelicanus occidentalis*	BR	A							1	1
Ardeidae	Striated Heron, *Butorides striatus*	BR	C			2					2
	Cattle Egret, *Bubulcus ibis*	BR	A	1				2		3	6
	Snowy Egret, *Egretta thula*	BV	A						1	1	2
	Little Blue Heron, *Egretta caerulea*	BV	A			2		1		1	4
Cathartidae	Black Vulture, *Coragyps atratus*	BR	A	2			1				3
Falconidae	Yellow-headed Caracara, *Milvago chimachima*	BR	C							1	1
Rallidae	Purple Gallinule, *Porphyrio martinica*	BR	C			2					2
Charadriidae	Southern Lapwing, *Vanellus chilensis*	BR	A	5							5
Scolopacidae	Wilson's Snipe, *Gallinago delicate*	MN	U	1							1
	Spotted Sandpiper, *Actitis macularia*	MN	C			1					1
	Lesser Yellowlegs, *Tringa flavipes*	MN	A						1		1
	Solitary Sandpiper, *Tringa solitaria*	MN	C						1	1	2
	Semipalmated Sandpiper, *Calidris pusilla*	MN	A							1	1
Jacanidae	Wattled Jacana, *Jacana jacana*	BR	A			5					5
Columbidae	Common Ground-Dove, *Columbina passerine*	BR	C	2							2
	Ruddy Ground-Dove, *Columbina talpacoti*	BR	A	2							2
Psittacidae	Green-rumped Parrotlet, *Forpus passerinus*	BR	U	6							6
Cuculidae	Smooth-billed Ani, *Crotophaga ani*	BR	A		9				1		10
Trochilidae	White-tailed Goldenthroat, *Polytmus guainumbi*	BD	U			3					3
	Copper-rumped Hummingbird, *Amazilia tobaci*	BR	A							1	1
Furnariidae	Yellow-chinned Spinetail, *Certhiaxis cinnamomea*	BR	C			3	2				5
Thamnophilidae	Barred Antshrike, *Thamnophilus doliatus*	BR	C					1	2		3
Tyrannidae	Yellow-bellied Elaenia, *Elaenia flavogaster*	BR	C	2							2
	Bran-colored Flycatcher, *Myiophobus fasciatus*	BR	U	1							1
	Pied Water-Tyrant, *Fluvicola pica*	BR	C			4				3	7
	Great Kiskadee, *Pitangus sulphuratus*	BR	A	2					4	1	7
	Tropical Kingbird, *Tyrannus melancholicus*	BR	A			1		1		3	5
Mimidae	Tropical Mockingbird, *Mimus gilvus*	BR	C	1				1	2		4
Coerebidae	Bananaquit, *Coereba flaveola*	BR	A					2			2
Thraupidae	Blue-gray Tanager, *Thraupis episcopus*	BR	C	4					3		7
	Palm Tanager, *Thraupis palmarum*	BR	A	1							1
Emberizidae	Saffron Finch, *Sicalis flaveola*	BR	U					3			3
	Blue-black Grassquit, *Volatinia jacarina*	BR	A	12	3	4		11	4		34
Cardinalidae	Grayish Saltator, *Saltator coerulescens*	BR	C	1							1
Parulidae	Yellow Warbler, *Dendroica petechia*	MN	C			1					1
	Northern Waterthrush, *Seiurus noveboracensis*	MN	C	1							1
	Masked Yellowthroat, *Geothlypis aequinoctialis*	BR	U				2	1			3

Table 4 Bird species observed during one site visit and their status and abundance in Trinidad.

Family	Species	Status	Abund	Sector							
				1	2	3	4	5	6	ROW	TOTAL
Icteridae	Yellow Oriole, *Icterus nigrogularis*	BR	C		1		2				3
	Yellow-hooded Blackbird, *Chrysomus icterocephalus*	BR	A			5				1	6
	Shiny Cowbird, *Molothrus bonariensis*	BR	A	9					1		10
	Carib Grackle, *Quiscalus lugubris*	BR	A					2		1	3
Estrildidae	Common Waxbill, *Estrilda astrild*	BR	L					4	4		8

Status Categories (White et al 2007)

BR Resident species without significant movement out of Trinidad and Tobago.
BD Species that breed locally and migrate or disperse to the mainland (sometimes only partially) in the non-breeding period.
BV Resident, regularly breeding species whose numbers are augmented by visitors from continental North or South America.
MN Non breeding migrants from continental North America. Predominantly over wintering.

Abundance categories (White et al 2007)

A Abundant; widespread and usually in some numbers in suitable habitat.
C Common, usually found in suitable habitat.
U Uncommon; occasionally seen in suitable habitat in small numbers or singly.
L Locally distributed in restricted habitat; but may be not uncommon there.

Table 5. Non-avian fauna observed during site visits

Group	Family	Species	Notes
Gastropoda	Ampullariidae	*Pomacea glauca*, River Conch	Observed along watercourse
(Snails)		*Marisa cornuarietis*, Ram's horn Snail	Observed along watercourse
Decapoda (Crabs)	Trichodactyliidae	*Trichodactylus dentatus*, Crab	Single specimen observed
Pices (Fish)	Callichthyidae	*Hoplosternum littorale*, Cascadura	Signs of Cascadura present
	Characidae	*Astyanax bimaculatus,* Two-spot Sardine	Abundant in watercourse
	Cichlidae	*Cichlasoma taenia,* Brown Coscorob	Present in watercourse
	Erythrinidae	*Hoplias malabaricus*, Guabine	Not observed but reported by adjacent resident.
	Poeciliidae	*Poecilia reticulata,* Guppy	Abundant in watercourse
	Rivulidae	*Rivulus hartii*, Jumping Guabine	Not observed but likely to be present
	Synbranchidae	*Synbranchus marmoratus*, Zangee	Not observed but likely to be present
Anura	Bufonidae	*Bufo beebei*	Not observed but likely to be present
(Frogs)		*Bufo Marinus,* Crapeau	One individual heard
	Hylidae	*Hyla crepitans*, Flying Frog	Not observed but likely to be present
		Hyla geographica, Flying Frog	Tadpoles observed in watercourse
		Hyla microcephala misera	Abundant along watercourse
		Phrynohyas venulosa	Not observed but likely to be present
		Scinax rubra, Savanna Frog	Scattered throughout site
	Leptodactylidae	*Loptodactylus fuscus,*	One individual heard
		Loptodactylus validus	Scattered throughout site
		Physalaemus pustulosus	Abundant throughout site
	Microhylidae	*Elachistocleis ovalis*	A few individuals heard
	Pseudidae	*Pseudis paradoxa caribensis,* Paradoxyl Frog	Not observed but likely to be present
Crocodylia (Crocodiles)	Alligatoridae	*Caiman crocodilus crocodilus,* Spectacled Caiman	Observed along watercourse
Squmata (Lizards)	Gekkonidae	*Gonatodes vittatus vittatus,* Streak Lizard	One individual observed at site
	Iguanidae	*Anolis aeneus*	One observed along ROW
		Iguana iguana, Iguana	One observed along ROW
Mamalia (Mammals)	Didelphidae	*Didelphis marsupialis,* Black-eared Opossum	Reported by adjacent resident
	Muridae	*Rattus norvegicus*, Warf Rat	Reported by adjacent resident
	Muridae	*Mus musculus*, House Mouse	Reported by adjacent resident
	Viverridae	*Herpestes auropunctatus*, Small Indian Mongoose	Observed by watchman at adjacent site

The site was once cultivated with sugarcane. Remnants of the crop and the ridges upon which it was grown still exist in the well drained portions of the site. Low lying areas to the north and west of the site support a few species of plants and animals usually associated with wetlands. This suggests that this flooded condition has persisted for some time. The sugarcane crop does not thrive under poorly drained conditions and thus in the past the drainage must have been better. This small wetland may disappear if the drainage of the site is improved.

The site is highly disturbed and with the exception of seven species the bird species observed are widespread in suitable habitat in Trinidad and considered common or abundant. The uncommon species include Wilson's Snipe, Green-rumped Parrotlet, White-tailed Goldenthroat, Bran-coloured Flycatcher, Masked Yellowthroat, Saffron Finch and Common Waxbill. The White-tailed Goldenthroat breeds in Trinidad during the wet season and disperses to mainland South America during the non-breeding period. This species is dependant on flooded savannah conditions and is typically seen in the Waller Field and Aripo Savannah areas as well as the edges of Nariva Swamp, Caroni Swamp and Oropuche Lagoon. The conditions available at the site appear to be suitable for this species. The Common Waxbill is not native to South America. It is a common cage-bird of African origin which was first observed in Orange Grove in 1987 (White 1988). Since this time the population has naturalised and appears to have been spreading. The species had previously been recorded from the Brechin Castle area, but this site represents the most south-westerly sighting of the species in Trinidad. The Saffron Finch is a comparatively localised species. It is often trapped as a cagebird but the population in the Point Lisas area appears to be surviving, probably in part due to large expanses of regularly mown grasses and comparatively restricted access to trappers.

Five species of shorebirds and two warblers which migrate from North America and which overwinter in Trinidad were observed at the site. These include Wilson's Snipe, Spotted Sandpiper, Lesser Yellowlegs, Solitary Sandpiper, Semipalmated Sandpiper, Yellow Warbler and Northern Waterthrush. The shorebirds were feeding in small patches of soil exposed as a result of pipe-laying exercises. There is a wide variety of shorebirds which may potentially feed at the site if the vegetation is cleared. Two species, the Little Blue Heron and Snowy Egret are local resident species whose numbers are augmented seasonally by visiting birds.

Five species of fish were recorded and at least two additional species are likely to inhabit the site. These species are all common and widespread south of the Northern Range. The Cascadura observed at the northeast area of the site may occur naturally or may have escaped from the fish pond adjacent to the site. The flooded portion of the site will provide a small area of habitat in which the Cascadura are likely to nest.

Five amphibians were observed and an additional three species probably inhabit the site as they have been collected under similar conditions at Waterloo. These species are all common and widespread in Trinidad. The reptiles observed are limited to four species including the Spectacled Caiman and Iguana. Reptiles are likely to be greatly underestimated unless extensive surveys are conducted which are beyond the scope of the current exercise. Similarly the observations on mammals are limited to observations of the residents of the area and are limited to comparatively well known pest species and the introduced mongoose. Non-vertebrate macro

fauna was limited to one crab and two molluscs. Several species of dragonflies were observed but not identified. Butterflies were very few and no large insects were apparent.

None of the species observed are considered endangered, threatened or rare in Trinidad under the Conservation of Wildlife Bill of 2003, but the Green-rumped Parrotlet, Spectacled Caiman and Iguana are listed in Schedule 1 of the Bill as species which require a harvesting licence. None of the species observed are listed as Environmentally Sensitive Species, nor are any of these species listed in the 2003 IUCN Red List of Threatened Species. Several of the species observed, including the Yellow-headed Carcacara, Green-rumped Parrotlet, White-tailed Goldenthroat, Spectacled Caiman and Iguana are listed under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). These species are not particularly threatened but they are listed under Appendix II of CITES because they can be confused with species genuinely threatened by international trade.

The ROW for the proposed pipelines runs through an existing industrial area. There is a small marsh at the end of the southern pipeline where it meets the EISI site and there is a small ravine at the initial section of the northern pipeline ROW. These lands are already industrial and are of little significance to wildlife.

Along the west coast of Trinidad, just 2 km from the site and 100m from the end of the pipeline ROW are the west coast mudflats and small areas of fringing mangrove. The general conditions along the west coast are highly significant to migrating shorebirds and seabirds (Morrison and Ross 1989, Hayes et al, 2004; White & Kenefick, 2004); however the areas adjacent to the industrial estate are less accessible to birdwatchers and are less well known than the more accessible sites.

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Flora and Fauna Species Identified in the Immediate Project Area

Group	Family	Species		Notes
		Scientific Name	Common Name	
Fauna				
Gastropoda (Snails)	Ampullariidae	Pomacea glauca	River Conch	Observed along watercourse
		Marisa cornuarietis	Ram's horn Snail	Observed along watercourse
Decapoda (Crabs)	Trichodactyliidae	Trichodactylus dentatus	Crab	Single specimen observed
Pices (Fish)	Callichthyidae	Hoplosternum littorale	Cascadura	Signs of Cascadura present
	Characidae	Astyanax bimaculatus	Two-spot Sardine	Abundant in watercourse
	Cichlidae	Cichlasoma taenia	Brown Coscorob	Present in watercourse
	Erythrinidae	Hoplias malabaricus	Guabine	Not observed but reported by adjacent resident.
	Poeciliidae	Poecilia reticulate	Guppy	Abundant in watercourse
	Rivulidae	Rivulus hartii	Jumping Guabine	Not observed but likely to be present
	Synbranchidae	Synbranchus marmoratus		Not observed but likely to be present
Anura (Frogs)	Bufonidae	Bufo beebei		Not observed but likely to be present
		Bufo Marinus	Crapeau	One individual heard
	Hylidae	Hyla crepitans	Flying Frog	Not observed but likely to be present
		Hyla geographica	Flying Frog	Tadpoles observed in watercourse
		Hyla microcephala misera		Abundant along watercourse
		Phrynohyas venulosa		Not observed but likely to be present
		Scinax rubra	Savanna Frog	Scattered throughout site
	Leptodactylidae	Loptodactylus fuscus,		One individual heard
		Loptodactylus validus		Scattered throughout site
		Physalaemus pustulosus		Abundant throughout site
	Microhylidae	Elachistocleis ovalis		A few individuals heard
	Pseudidae	Pseudis paradoxa caribensis	Paradoxyl Frog	Not observed but likely to be present
Crocodylia (Crocodiles)	Alligatoridae	Caiman crocodilus crocodilus	Spectacled Caiman	Observed along watercourse
Squmata (Lizards)	Gekkonidae	Gonatodes vittatus vittatus	Streak Lizard	One individual observed at site
	Iguanidae	Anolis aeneus		One observed along ROW
		Iguana iguana	Iguana	One observed along ROW
Mamalia (Mammals)	Didelphidae	Didelphis marsupialis	Black-eared Opossum	Reported by adjacent resident
	Muridae	Rattus norvegicus	Warf Rat	Reported by adjacent resident
	Muridae	Mus musculus	House Mouse	Reported by adjacent resident
	Viverridae	Herpestes auropunctatus	Small Indian Mongoose	Observed by watchman at adjacent site

Flora and Fauna Species Identified in the Immediate Project Area

Group	Family	Species		Notes
		Scientific Name	Common Name	
Aves (Birds)	Pelicanidae	Pelicanus occidentalis	Brown Pelican	Resident species without significant movement out of Trinidad and Tobago
	Ardeidae	Butorides striatus	Striated Heron	Resident species without significant movement out of Trinidad and Tobago
		Bubulcus ibis	Cattle Egret	Resident species without significant movement out of Trinidad and Tobago
		Egretta thula	Snowy Egret	Resident, regularly breeding species whose numbers are augmented by visitors from continental North or South America.
		Egretta caerulea	Little Blue Heron	Resident, regularly breeding species whose numbers are augmented by visitors from continental North or South America.
	Cathartidae	Coragyps atratus	Black Vulture	Resident species without significant movement out of Trinidad and Tobago
	Falconidae	Milvago chimachima	Yellow-headed Caracara	Resident species without significant movement out of Trinidad and Tobago
	Rallidae	Porphyrio martinica	Purple Gallinule	Resident species without significant movement out of Trinidad and Tobago
	Charadriidae	Vanellus chilensis	Southern Lapwing	Resident species without significant movement out of Trinidad and Tobago
	Scolopacidae	Gallinago delicate	Wilson's Snipe	Non breeding migrants from continental North America. Predominantly over wintering.
		Actitis macularia	Spotted Sandpiper	Non breeding migrants from continental North America. Predominantly over wintering.
		Tringa flavipes	Lesser Yellowlegs	Non breeding migrants from continental North America. Predominantly over wintering.
		Tringa solitaria	Solitary Sandpiper	Non breeding migrants from continental North America. Predominantly over wintering.
		Calidris pusilla	Semipalmated Sandpiper	Non breeding migrants from continental North America. Predominantly over wintering.
	Jacanidae	Jacana jacana	Wattled Jacana	Resident species without significant movement out of Trinidad and Tobago
	Columbidae	Columbina passerine	Common Ground-Dove	Resident species without significant movement out of Trinidad and Tobago
		Columbina talpacoti	Ruddy Ground-Dove	Resident species without significant movement out of Trinidad and Tobago

Flora and Fauna Species Identified in the Immediate Project Area

Group	Family	Species		Notes
		Scientific Name	Common Name	
	Psittacidae	Forpus passerinus	Green-rumped Parrotlet	Resident species without significant movement out of Trinidad and Tobago
	Cuculidae	Crotophaga ani	Smooth-billed Ani	Resident species without significant movement out of Trinidad and Tobago
	Trochilidae	Polytmus guainumbi	White-tailed Goldenthroat	Species that breed locally and migrate or disperse to the mainland (sometimes only partially) in the non-breeding period.
		Amazilia tobaci	Copper-rumped Hummingbird	Resident species without significant movement out of Trinidad and Tobago
	Furnariidae	Certhiaxis cinnamomea	Yellow-chinned Spinetail	Resident species without significant movement out of Trinidad and Tobago
	Thamnophilidae	Thamnophilus doliatus	Barred Antshrike	Resident species without significant movement out of Trinidad and Tobago
	Tyrannidae	Elaenia flavogaster	Yellow-bellied Elaenia	Resident species without significant movement out of Trinidad and Tobago
		Myiophobus fasciatus	Bran-colored Flycatcher	Resident species without significant movement out of Trinidad and Tobago
		Fluvicola pica	Pied Water-Tyrant	Resident species without significant movement out of Trinidad and Tobago
		Pitangus sulphuratus	Great Kiskadee	Resident species without significant movement out of Trinidad and Tobago
		Tyrannus melancholicus	Tropical Kingbird	Resident species without significant movement out of Trinidad and Tobago
	Mimidae	Mimus gilvus	Tropical Mockingbird	Resident species without significant movement out of Trinidad and Tobago
	Coerebidae	Coereba flaveola	Bananaquit	Resident species without significant movement out of Trinidad and Tobago
	Thraupidae	Thraupis episcopus	Blue-gray Tanager	Resident species without significant movement out of Trinidad and Tobago
		Thraupis palmarum	Palm Tanager	Resident species without significant movement out of Trinidad and Tobago
	Emberizidae	Sicalis flaveola	Saffron Finch	Resident species without significant movement out of Trinidad and Tobago
		Volatinia jacarina	Blue-black Grassquit	Resident species without significant movement out of Trinidad and Tobago

Flora and Fauna Species Identified in the Immediate Project Area

Group	Family	Species		Notes
		Scientific Name	Common Name	
	Cardinalidae	Saltator coerulescens	Grayish Saltator	Resident species without significant movement out of Trinidad and Tobago
	Parulidae	Dendroica petechia	Yellow Warbler	Non breeding migrants from continental North America. Predominantly over wintering.
		Seiurus noveboracensis	Northern Waterthrush	Non breeding migrants from continental North America. Predominantly over wintering.
		Geothlypis aequinoctialis	Masked Yellowthroat	Resident species without significant movement out of Trinidad and Tobago
	Icteridae	Icterus nigrogularis	Yellow Oriole	Resident species without significant movement out of Trinidad and Tobago
		Chrysomus icterocephalus	Yellow-hooded Blackbird	Resident species without significant movement out of Trinidad and Tobago
		Molothrus bonariensis	Shiny Cowbird	Resident species without significant movement out of Trinidad and Tobago
		Quiscalus lugubris	Carib Grackle	Resident species without significant movement out of Trinidad and Tobago
	Estrildidae	Estrilda astrild	Common Waxbill	Resident species without significant movement out of Trinidad and Tobago
Flora				
Monocot	Cyperaceae	Fimbristylis meliacea	Grasslike fimbry	
		Torulinium odoratum		
	Marantaceae	Thalia spp	Marantaceae	
	Poaceae	Ischaemum rugosum	Ribbed murainagrass	
		Urochloa mutica	Para grass	Native of Africa
		Panicum maximum	Guinea grass	
		Ischaemum rugosum	Ribbed murainagrass	
		Paspalum fasciculatum	Mexican crowngrass	
		Leersia hexandra	Cascadoux grass	
Dicot	Euphorbiaceae	Caperonia palustris	Sacatrapo	
	Fabaceae	Aeschynomene sensitiva	Sensitive jointvetch	
		Pueraria phaseoloides	Tropical kudzu	
	Lamiaceae	Hyptis sp.		
	Olacaceae	Rottboelia sp		
	Ongaraceae	Ludwigia erecta	Yerba de jicotea	Dominant in wetland environments
	Solanaceae	Solanum jamaicense	Jamaican nightshade	
	Sphenocleaceae	Sphenochlea		

Species Identified in the Wider 5km Study Area

Group	Scientific Name	Common Name
Plants	Paspalum virgatum	Razor grass
	Saccharum spp	Sugarcane
	Cocus nucifera	Coconut
	Erythrina spp	Immortel
	Syzygium cumini	Java plum
	Spondias mombin	Hogplum
	Cordia curassavica	Black sage
	Tectona grandis	Teak
	Bambusa vulgaris	Bamboo
	Psidium guajava	Guava
	Erythrina spp	Swamp immortelle
	Psidium guajava	guava
	Poinciana regia	Flamboyant
	Casuarina equisetifolia	Casuarina
	Tabebuia serratifolia	Yellow poui
	Mangifera indica	Mango
	Terminalia catappa	Almond
	Artocarpus altilis	Chataigne
	Meliococcus bijugatus	Chennette
	Acrocomia aculeate	Gru-gru bouef
	Roystonea oleracea	Royal palm
	Samanea saman	Samaan
	Spondias cytherea	Pommecythere
	Carica papaya	Paw paw
	Rhizophora mangle	Red mangrove
	Avicennia germinans	Black mangrove
	Laguncularia racemosa	White mangroves
	Eleocharis spp	Spikerush
	Acrostium aureum	Mangrove fern
	Cyperus haspan,	Sharp-edge sedge
	Kyllinga bervifolia	Green kyllinga
	Cyperus articulatus	Jointed flatsedge
	Eleocharis mutate	Scallion Grass
	Typha domingensis	Southern cattail
	Cecropia peltata	Bois cano
	Andira inermis	Angelin
	Erythrina fusca	Water immortelle
Mammalia (Mammals)	Cyclopes didactylus	Silky anteater
	Procyon cancrivorus	Crab-eating raccoon
	Lutra langicaudis	Neo-tropical otter
Pices (Fish)	Hoplias malabaricus	Guabine
	Astyanax bimaculatus	Two-spotted sardine
	Aquidens pulcher	Blue coscorob
	Dormitator maculates	Goby
	Cichlasoma taenia	Brown coscorob
	Corynopoma riisei	Swordtail sardine
	Poecilia reticulate	Fancy guppy
	Micropoecilia picta	Swamp guppy
	Selanaspis herzbergii	
	Centropomus ensiferus	Snook
	Stellifer sp	Croaker
	Anableps anableps	Four-eyed fish
	Achirus lineatus	Flatfish
	Rypticus randalli	Soap fish

Species Identified in the Wider 5km Study Area

Group	Scientific Name	Common Name
Mollusca (clams, snails, mussles)	Melanoides uberculata	Snail
	Crassostrea rhizophorae	Oyster
	Brachidontes modiolus	Yellow mussel
	Brachidontes exustus	Scorched mussel
	Perna viridis	Green lip mussel
	Solen obliquus	Antillean razor shell
Aves (birds)	Tachycineta albiventer	White-winged swallow
	Psarocolius decumanus	Crested oropendola
	Seirus noveboracensis	Northern waterthrush
	Casmeroduis albus	Great egrets
	Egretta caerula	Little blue herons
	Bubulcus ibis	Cattle egrets
	Jacana jacana	Wattled jacanas
	Fluvicola pica	Pied water-tyrants
	Arundinicola leucocephala	White-headed marsh tyrants
	Certhiaxis cinnamomea	Yellow-chinned spinetails
	Mimus gilvus	Tropical mockingbird
	Larus atricilla	Laughing gull
	Quiscalus lugubris	Carib grackle
	Volatinia jacarina	Blue-black grassquit
	Thamnophilus doliatus	Barred Antshrike
	Columbina passerine	Common ground dove
	Charadrius collaris	Semi-plated plover
	Egretta tricolor	Tricoloured heron
	Leptodon cayanensis	Grey-headed kite

JARIC Environment Safety and Health Services Ltd

CariSal Point Lisas Development

Plot of Wetland Boundary

Report

Submitted to: CariSal Limited

Date submitted: 2nd June 2008

Point Lisas CariSal Development

Wet Land Boundary Delineation

Notes for Accompanying Shapefiles

- The UTM Projection used was the Naparima 1955 Datum.
- The equipment used was a Garmin GPS10 linked to a Dell Axim PDA running ArcPad GIS software.
- Software used to process the field collected shapefiles was ArcGIS 9.
- Boundaries of the permanent and annual wetlands were walked and the position of the boundaries were recorded using the above system.
- Boundaries of the permanent wetland were taken to be the boundary of occurrence of *Leersia hexandra*.
- Boundaries of the annual wetland were taken to be were the grass *Urochloa mutica* gave way dominance to other species characteristic of drier conditions such as *Panicum maximum* or *Solanum jamaicense*. To the north of the east-west running drainage ditch, the annual wetland was characterized by *Caperonia palustris, Ludwigia sp.* and *Sphenochlea sp.*.
- The boundaries of the annual wetland and the upland vegetation communities were in most cases inter-digitated due to the east-west running ridge and furrow system (horizontal amplitude of ~3m and vertical amplitude of ~0.3m). At the boundaries, the annual wetland communities persisted in the furrows alongside the upland communities on the ridges. The boundary was recorded where upland vegetation became large enough to over shadow the furrow vegetation which still persisted but at lower densities and as an understory.
- The accuracy of the GPS coordinates was reported to be $\pm$ 5m consistently during recording.

The coordinates of the centre of the permanent swamp are:
667373E 1148025N

The coordinates of the northern extremity are:
667375E 1148059N

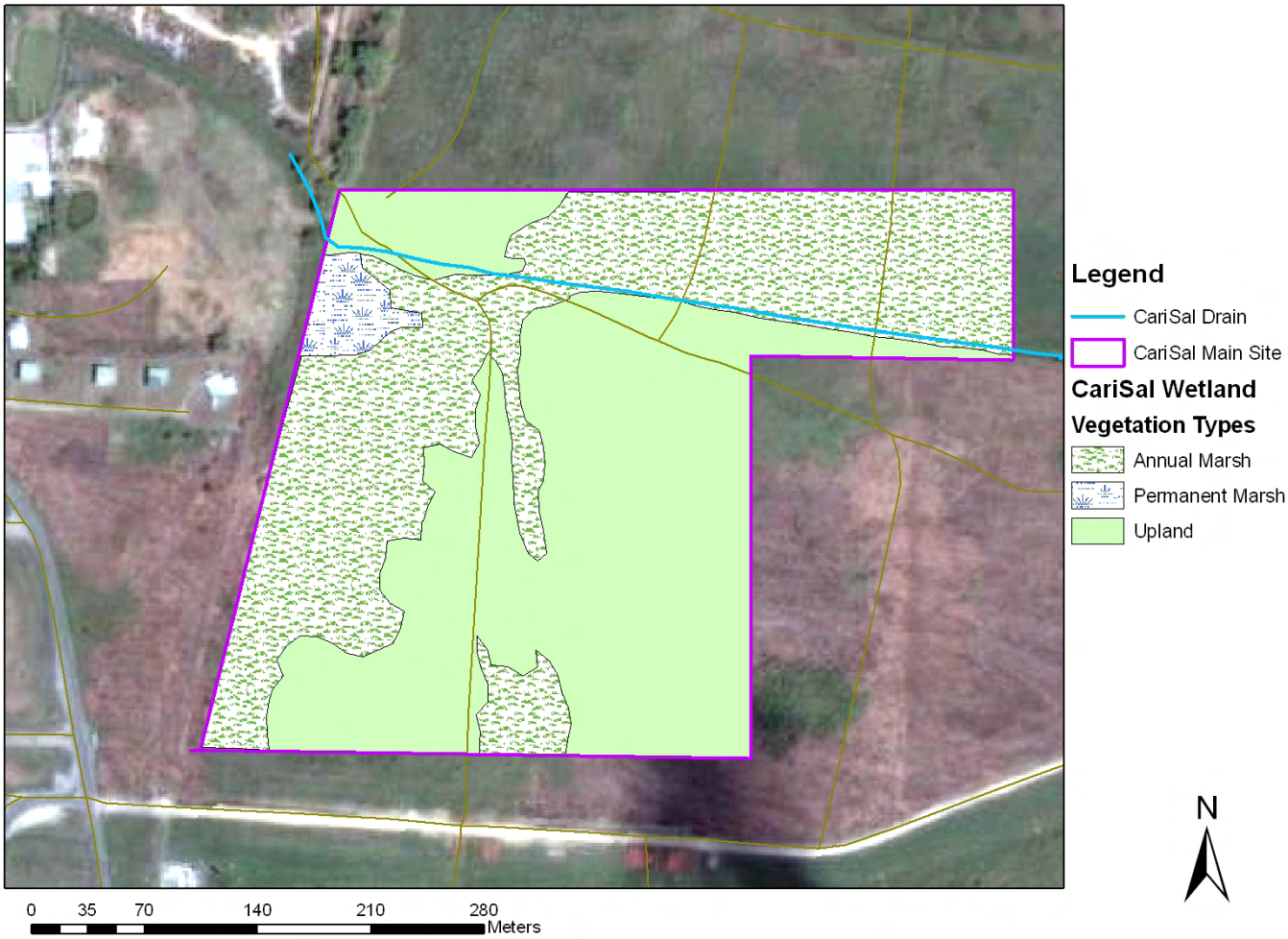
The coordinates of the eastern extremity are:
667425E 1148015N

The coordinates of the southern extremity are:
667370E 1147993N

The coordinates of the western extremity are:
667345E 1147996N

All coordinates are UTM projection in the Naparima 1955 Datum.

CariSal Mainsite Wetland Delineation



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WATER QUALITY

Document	Page
Baseline Ground Water Quality Monitoring Report, August 28, 2007	
Baseline Ground Water Quality Monitoring Report, November 13, 2007	
Baseline Surface Water Quality Monitoring Report, July 4, 2007	
Baseline Surface Water Quality Monitoring Report December 6, 2007	

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Report

Baseline Ground Water Quality Monitoring Report

August 28, 2007

Prepared for:

CariSal Limited

Presented By:

Kaizen Environmental Services (Trinidad) Limited
Pointe-a-Pierre
Trinidad, W.I

Project Manager:

_____

Sven Somair

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1 INTRODUCTION

1.1 Background

At a meeting on May 31, 2007, CariSal Limited ("CariSal") requested a proposal from Kaizen Environmental Services Trinidad Limited ("Kaizen"), for conducting baseline groundwater quality monitoring at the proposed project area for a facility for the production of caustic soda, calcium chloride, hydrochloric acid and sodium hypochlorite. A proposal was submitted by Kaizen (*re: Kaizen Proposal No.: 07-0166*) for the establishment of two piezometers and the collection and analysis of four ground water samples over two sampling events. This proposal was subsequently accepted by Carisal.

This report documents the results of the baseline groundwater quality monitoring in the vicinity of the project area.

1.2 Assignment Objective

The objectives of the assignment are:

- To establish two piezometers within the project area.
- To conduct a groundwater quality sampling and analysis program that will represent the baseline groundwater quality within the study area of the proposed plant.

2 METHOD STATEMENT

This chapter presents a description of the installation of the piezometers as well as, the sampling and analysis program implemented during the conduct of this assignment.

2.1 Piezometer Locations

Two piezometers (groundwater monitoring wells) were installed within the project area. The following table presents a description of the locations, while Figure 1 shows the location of the piezometers.

TABLE 2-1: PIEZOMETER LOCATIONS

Location No.	Description	GPS location
1	South East Corner of Project Site	0667737 1147898
2	South West Corner of Project Site	0667656 1147917

2.2 Piezometer Installation

Two piezometers were installed onsite. These piezomteres were constructed from PVC pipe. The bottom two metres of the piezometers were slotted to allow the flow of water into the pipe. This slotted section was covered with a small aperture mesh to prevent soil particles from blocking the slots. The bottom end was also sealed, while the top end was capped. The top end cap was removable so as to allow the collection of groundwater samples. A borehole was drilled using a Portadrill Mini drilling rig to ground water. After ground water was encountered, the borehole was advanced to one metre below the ground water level. After the borehole that attained the one metre below the groundwater depth, the piezometer was inserted into the borehole. Gravel was placed around the piezometer to provide a permeable area around the piezometer promoting the collection of ground water. After the piezometers were secured in the boreholes by the gravel, the top of the borehole was sealed with bentonite. This was to prevent rainwater and surface runoff from entering through the top of the borehole. The piezometers were installed to be approximately one metre above the ground surface level to allow for easy identification.

Based on discussions with Carisal, these piezometers were not removed from the site.

2.3 Sample Collection

Prior to each sampling event, the piezometers were purged by pumping out all the water. The piezometers were allowed to recharge before a sample was collected. The samples were collected using a peristaltic pump. The peristaltic pump was cleaned

and serviced prior to sampling. Additionally, water from the piezometers was used to flush the pump prior to sample collection.

All samples were collected in accordance with standard sampling methods. Samples collected were stored in specially prepared bottles, supplied by the laboratory, for the respective analysis to be conducted. In order to confirm accuracy of the samples collected, duplicate samples were collected from each piezometer.

The following table presents the schedule for the collection of the ground water samples.

TABLE 2-2: SAMPLING SCHEDULE

Well Number	Sampling Date
1	16/07/2007
	19/07/2007
2	16/07/2007
	26/07/2007*

* Well 2 could not be sampled on 19/07/2007 because of the inaccessibility of the monitoring well due to waterlogged conditions

2.4 Sample Analysis

Samples were delivered to the Kaizen Laboratory, located in Pointe-a-Pierre, on the same day of sampling. The following table presents the parameter analyzed and the test method used for the analysis.

TABLE 2-3: PARAMETERS ANALYSED

Parameter	Test Method
Acute Toxicity (water)	Based on 96 hr test, USEPA 600-4:-9010 27F 1993
Ammonia (water)	Based on Nessler Method, Hach no. 8038
BOD	Based on APHA 5210B
Chloride (water)	Based on Argentometric Method, APHA 4500 CL-B
COD (water)	Based on APHA 5220D
Cyanide (water)	Based on Colorimetric Method, APHA 4500 CN-E
Dissolved Oxygen (water)	Based on Membrane Electrode Method, APHA 4500 O G
Fecal Coliforms (water)	Based on APHA 9221E
Hexavalent Chromium (water)	Based on Colorimetric Method APHA 3500-Cr B, Hach no. 8023 Observation
Oil and Grease (water)	Based on APHA 5520B, USEPA 1664
pH (water)	Based on APHA 4500-H+B
Sulphide (water)	Based on APHA 4500- S2- Methylene Blue Method,

Parameter	Test Method
	HACH no 8131
Temperature (water)	Based on Laboratory & Field Method APHA 2550B
Dissolved Metals (water)	Based on APHA 3030B & 3111B
Total Arsenic, Selenium (water)	Based on APHA 3114B
Total Mercury (water)	Based on APHA 3112B
Total Metals (water)	Based on APHA 3030E & 3111B
Total P (water)	Based on APHA 3030 E & 3120 B
Total Petroleum Hydrocarbon (water)	Based on Partition, Gravimetric USEPA 1664, APHA 5520B
Total Phenol (water)	Based on APHA 5530 B & C
Total Suspended Solids (water)	Based on Filtration, Gravimetric, APHA 2540D

The results of the analysis conducted are presented in Chapter 3; the laboratory reports are presented in Appendix 1.

FIGURE 1: LOCATION OF PIEZOMETERS

3 RESULTS OF ANALYSIS

The following table presents the results of the analysis conducted on the samples collected. At present, Trinidad and Tobago has no established guidelines for ambient groundwater quality. Neither the Water Pollution Rules, 2001 nor the TTS 547: 1998 (Specification for Effluent from Industrial Processes Discharged into the Environment) has standards discharge into groundwater. Additionally, both these standards, as well as, the TTS 417:1993 (Specification for the Liquid Effluent from Domestic. Wastewater Treatment Plants into the Environment) prohibits the direct discharge of wastewater (either process or domestic) into groundwater. For comparative purposes only, the analytical results of the baseline groundwater monitoring program is compared to the discharge criteria for environmentally sensitive areas as stipulated in the Water Pollution Rules and the TTS 547: 1998.

The laboratory reports are presented as an Appendix.

TABLE: 3-1: RESULTS OF SURFACE WATER ANALYSIS

Parameter	Units	Well 1		Well 2		Water Pollution Rules*	TTS 417:1993	TTS 547:1998*
		16/07/2007	19/07/2007	16/07/2007	26/07/2007			
pH @ 25 °C		6.66	6.70	6.75	6.83	6 – 9	6-9	6 - 9
Temperature	Degrees Celsius	27.5	25.5	27.3	28.1	NIAA	NQ	NIAA
Dissolved Oxygen	mg/L	2.23	2.31	2.30	2.55	< 4	NQ	NQ
Biochemical Oxygen Demand (BOD)	mg/L	45.30	<6	>88.56	>111.00	10	nil	10
Chemical Oxygen Demand (COD)	mg/L	43.0	7	52.0	27	60	NQ	60
Total Suspended Solids	mg/L	3,800.0	2,340.0.0	5,010.0	2,224.0	15	Nil	15
Oil and Grease	mg/L	3.9	< 1.6	3.8	<1.6	NR	NQ	NR
Total Petroleum Hydrocarbons	mg/L	<1.6	< 1.6	<1.6	<1.6	NR	NQ	NQ
Ammonia-N	mg/L	0.64	0.86	0.58	0.41	0.1	NQ	0.01
wat-phosphorus (as phosphate)	mg/L (as phosphate)	0.17	0.18	0.14	<0.01	0.1	NQ	0.1
Sulphide (H2S)	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	0.2	NQ	0.2
Chloride	mg/L	<0.15	571.45	<0.15	256.66	NIAA	NQ	250
Residual Chloride	mg/L	**	<0.5	**	<0.5	0.2	Nil	0.2
Hexavalent Chromium (Cr6+)	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	0.01	NQ	0.1
Dissolved Iron	mg/L	1.58	01.14	5.30	<0.003	1.0	NQ	1.0
Total nickel (Ni)	mg/L	< 0.006	0.038	0.070	0.154	0.5	NQ	0.5
Total copper (Cu)	mg/L	0.031	0.051	0.086	0.129	0.01	NQ	0.01
Total zinc (Zn)	mg/L	0.186	0.281	0.476	1.00	0.1	NQ	0.1
Total arsenic (As)	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	0.01	NQ	0.05
Total cadmium (Cd)	mg/L	< 0.003	< 0.003	< 0.003	< 0.003	0.01	NQ	0.01
Total mercury (Hg)	mg/L	< 0.00004	< 0.00004	< 0.00004	< 0.00004	0.005	NQ	0.005
Total lead (Pb)	mg/L	< 0.03	< 0.03	< 0.03	0.170	0.05	NQ	0.05

Parameter	Units	Well 1		Well 2		Water Pollution Rules*	TTS 417:1993	TTS 547:1998*
		16/07/2007	19/07/2007	16/07/2007	26/07/2007			
Cyanide	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	0.01	NQ	0.01
Phenol Total	mg/L	<0.003	<0.003	<0.003	<0.003	0.1	NQ	0.1
Acute Toxicity (LC50)	ppm	625,000.0	643,000.0	509,000.0	NATE	NATE	NQ	NQ
Faecal Coliform (MPN mtd)	MPN/100ml	> 1600	>1600	900	>1600	100	Nil	100
Total chromium (Cr)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.1	NQ	0.1
Depth to Groundwater	m	1.20		1.19				
Depth of Piezometer	m	2.80		3.53				

* Guideline for Discharge to Environmentally Sensitive Areas
** No Value due to interference within the sample matrix
NATE No Acute Toxic Effects
NQ Not Quoted
NR No Release
NIAA No Increase Above Ambient

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Report

Baseline Ground Water Quality Monitoring Report

November 13, 2007

Prepared for:

CariSal Limited

Presented By:

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Project Manager:

_____

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1 INTRODUCTION

1.1 Background

At a meeting on May 31, 2007, CariSal Limited ("CariSal") requested a proposal from Kaizen Environmental Services Trinidad Limited ("Kaizen"), for conducting baseline groundwater quality monitoring at the proposed project area for a facility for the production of caustic soda, calcium chloride, hydrochloric acid and sodium hypochlorite. A proposal was submitted by Kaizen (*re: Kaizen Proposal No.: 07-0166*) for the establishment of two piezometers and the collection and analysis of four ground water samples over two sampling events. This proposal was subsequently accepted by Carisal and the ground water monitoring exercise was subsequently conducted and a report was submitted.

Based on the findings of the report, it was identified that a number of parameters were high and Carisal requested that subsequent monitoring be conducted. A proposal for the monitoring was submitted on October 07, 2007 (*re: Kaizen Proposal No.: 07-0166 rev 01*). This report present the findings of the subsequent ground water monitoring.

1.2 Assignment Objective

The objectives of the assignment are:

- To repeat the monitoring on the two groundwater wells.
- To use two different sampling methods to collect the samples.

2 METHOD STATEMENT

This chapter presents a description of the installation of the piezometers as well as, the sampling and analysis program implemented during the conduct of this assignment.

2.1 Piezometer Locations

Two piezometers (groundwater monitoring wells) were installed within the project area. The following table presents a description of the locations.

TABLE 2-1: PIEZOMETER LOCATIONS

Location No.	Description
1	South East Corner of Project Site
2	South West Corner of Project Site

2.2 Sample Collection

Based on discussions with Carisal an its representatives, two methods of sample collection were used to collect the ground water samples.

Method 1

Method 1 involved the collection of the samples using a bailer. The two wells were left undisturbed since the last sampling event conducted in July, 2007. The bailer was inserted slowly into the well to collect the ground water sample. Care was taken not to touch the bottom or sides of well, so as not to disturb or re-suspend settled particles. As the bailer was between half and three quarter filled, the bailer was retrieved and the sample was placed into laboratory prepared bottles. The process was repeated until all sample bottled were filled with the required volume of water.

Method 2

Method 2 involved the collection of the samples using a low flow rate sampling pump. The pump used was an ISCO GLS Composite Sampler. This sampler was used to pump the groundwater out of the well and into a large container. A handheld meter was used to measure pH, temperature and conductivity on a real time basis. Only after these parameters were stabilized, were samples collected for laboratory analysis.

Additionally, an in-situ method to access the consistency of the turbidity of the groundwater was conducted prior to sample collection. This involved the collection of a ground water sample every thirty (30) seconds. These samples were placed in a small clear vial and presented against a white screen. The samples were shaken and compared to determine if the level opacity was consistent. Once this level was consistent, along with consistent pH, temperature and conductivity, samples were collected and sent for laboratory analysis.

All samples collected were stored in bottles specially prepared by the laboratory and stored on ice. The samples were delivered to the Kaizen's laboratory, at Pointe-a-Pierre, under strict chain of custody. The following table presents the schedule for the collection of the ground water samples.

TABLE 2-2: SAMPLING SCHEDULE

Method Number	Sampling Date
1 (Well 1 and 2)	9/10/2007
2 (Well 1 and 2)	10/10/2007

* Well 2 could not be sampled on 19/07/2007 because of the inaccessibility of the monitoring well due to waterlogged conditions

2.3 Sample Analysis

Samples were delivered to the Kaizen Laboratory, located in Pointe-a-Pierre, on the same day of sampling. The following table presents the parameter analyzed and the test method used for the analysis.

TABLE 2-3: PARAMETERS ANALYSED

Parameter	Test Method
Acute Toxicity (water)	Based on 96 hr test, USEPA 600-4:-9010 27F 1993
Ammonia (water)	Based on Nessler Method, Hach no. 8038
BOD	Based on APHA 5210B
Fecal Coliforms (water)	Based on APHA 9221E
Dissolved Metals (water)	Based on APHA 3030B & 3111B
Total Metals (water)	Based on APHA 3030E & 3111B
Total P (water)	Based on APHA 3030 E & 3120 B
Total Suspended Solids (water)	Based on Filtration, Gravimetric, APHA 2540D

The results of the analysis conducted are presented in Chapter 3; the laboratory reports are presented in Appendix 1.

3 RESULTS OF ANALYSIS

The following tables present the results of the analysis conducted on the samples collected. At present, Trinidad and Tobago has no established guidelines for ambient groundwater quality. Neither the Water Pollution Rules, 2001 nor the TTS 547: 1998 (Specification for Effluent from Industrial Processes Discharged into the Environment) has standards discharge into groundwater. Additionally, both these standards, as well as, the TTS 417:1993 (Specification for the Liquid Effluent from Domestic. Wastewater Treatment Plants into the Environment) prohibits the direct discharge of wastewater (either process or domestic) into groundwater. For comparative purposes only, the analytical results of the baseline groundwater monitoring program is compared to the discharge criteria for environmentally sensitive areas as stipulated in the Water Pollution Rules and the TTS 547: 1998.

The laboratory reports are presented as an Appendix.

TABLE: 3-1: RESULTS OF GROUNDWATER ANALYSIS FOR WELL 1

Parameter	Units	16/07/2007	19/07/2007	Method 1	Method 2	Water Pollution Rules*	TTS 417:1993	TTS 547:1998 *
				09/10/2007	10/10/2007			
pH @ 25 °C		6.66	6.70	NT	7.09	6 – 9	6-9	6 - 9
Temperature	Degrees Celsius	27.5	25.5	NT	30.45	NIAA	NQ	NIAA
Conductivity	mS/cm			NT	1199.0	NQ	NQ	NQ
Dissolved Oxygen	mg/L	2.23	2.31	NT	NT	< 4	NQ	NQ
Biochemical Oxygen Demand (BOD)	mg/L	45.30	<6	<6	<6.0	10	nil	10
Chemical Oxygen Demand (COD)	mg/L	43.0	7	NT	NT	60	NQ	60
Total Suspended Solids	mg/L	3,800.0	2,340.0.0	4660.0	1376.7	15	Nil	15
Oil and Grease	mg/L	3.9	< 1.6	NT	NT	NR	NQ	NR
Total Petroleum Hydrocarbons	mg/L	<1.6	< 1.6	NT	NT	NR	NQ	NQ
Ammonia-N	mg/L	0.64	0.86	0.15	0.22	0.1	NQ	0.01
wat-phosphorus (as phosphate)	mg/L (as phosphate)	0.17	0.18	0.14	0.25	0.1	NQ	0.1
Sulphide (H2S)	mg/L	< 0.010	< 0.010	NT	NT	0.2	NQ	0.2
Chloride	mg/L	<0.15	571.45	NT	NT	NIAA	NQ	250
Residual Chloride	mg/L	**	<0.5	NT	NT	0.2	Nil	0.2
Hexavalent Chromium (Cr6+)	mg/L	< 0.01	< 0.01	NT	NT	0.01	NQ	0.1
Dissolved Iron	mg/L	1.58	01.14	11.0	0.006	1.0	NQ	1.0
Total nickel (Ni)	mg/L	< 0.006	0.038	NT	NT	0.5	NQ	0.5
Total copper (Cu)	mg/L	0.031	0.051	0.048	0.033	0.01	NQ	0.01
Total zinc (Zn)	mg/L	0.186	0.281	0.715	0.134	0.1	NQ	0.1
Total arsenic (As)	mg/L	< 0.02	< 0.02	NT	NT	0.01	NQ	0.05
Total cadmium (Cd)	mg/L	< 0.003	< 0.003	NT	NT	0.01	NQ	0.01
Total mercury (Hg)	mg/L	< 0.00004	< 0.00004	NT	NT	0.005	NQ	0.005

Parameter	Units	16/07/2007	19/07/2007	Method 1	Method 2	Water Pollution Rules*	TTS 417:1993	TTS 547:1998 *
				09/10/2007	10/10/2007			
Total lead (Pb)	mg/L	< 0.03	< 0.03	0.08	<0.03	0.05	NQ	0.05
Cyanide	mg/L	< 0.010	< 0.010	NT	NT	0.01	NQ	0.01
Phenol Total	mg/L	<0.003	<0.003	NT	NT	0.1	NQ	0.1
Acute Toxicity (LC50)	ppm	625,000.0	643,000.0	NATE	NATE	NATE	NQ	NQ
Faecal Coliform (MPN mtd)	MPN/100ml	> 1600	>1600	>1600	300	100	Nil	100
Total chromium (Cr)	mg/L	< 0.005	< 0.005	NT	NT	0.1	NQ	0.1

*	Guideline for Discharge to Environmentally Sensitive Areas
**	No Value due to interference within the sample matrix
NATE	No Acute Toxic Effects
NQ	Not Quoted
NR	No Release
NIAA	No Increase Above Ambient
NT	Not Tested

TABLE: 3-1: RESULTS OF GROUNDWATER ANALYSIS FOR WELL 2

Parameter	Units	16/07/2007	19/07/2007	Method 1	Method 2	Water Pollution Rules*	TTS 417:1993	TTS 547:1998 *
				09/10/2007	10/10/2007			
pH @ 25 °C		6.75	6.83	NT	7.01	6 – 9	6-9	6 - 9
Temperature	Degrees Celsius	27.3	28.1	NT	30.3	NIAA	NQ	NIAA
Conductivity	mS/cm			NT	2.12	NQ	NQ	NQ
Dissolved Oxygen	mg/L	2.30	2.55	NT	NT	< 4	NQ	NQ
Biochemical Oxygen Demand (BOD)	mg/L	>88.56	>111.00	<6.0	<6.0	10	nil	10
Chemical Oxygen Demand (COD)	mg/L	52.0	27	NT	NT	60	NQ	60
Total Suspended Solids	mg/L	5,010.0	2,224.0	3210.0	1220.0	15	Nil	15
Oil and Grease	mg/L	3.8	<1.6	NT	NT	NR	NQ	NR
Total Petroleum Hydrocarbons	mg/L	<1.6	<1.6	NT	NT	NR	NQ	NQ
Ammonia-N	mg/L	0.58	0.41	0.30	0.25	0.1	NQ	0.01
wat-phosphorus (as phosphate)	mg/L (as phosphate)	0.14	<0.01	0.08	0.25	0.1	NQ	0.1
Sulphide (H2S)	mg/L	< 0.010	< 0.010	NT	NT	0.2	NQ	0.2
Chloride	mg/L	<0.15	256.66	NT	NT	NIAA	NQ	250
Residual Chloride	mg/L	**	<0.5	NT	NT	0.2	Nil	0.2
Hexavalent Chromium (Cr6+)	mg/L	< 0.01	< 0.01	NT	NT	0.01	NQ	0.1
Dissolved Iron	mg/L	5.30	<0.003	5.31	3.36	1.0	NQ	1.0
Total nickel (Ni)	mg/L	0.070	0.154	NT	NT	0.5	NQ	0.5
Total copper (Cu)	mg/L	0.086	0.129	0.031	0.036	0.01	NQ	0.01
Total zinc (Zn)	mg/L	0.476	1.00	0.410	0.149	0.1	NQ	0.1
Total arsenic (As)	mg/L	< 0.02	< 0.02	NT	NT	0.01	NQ	0.05
Total cadmium (Cd)	mg/L	< 0.003	< 0.003	NT	NT	0.01	NQ	0.01
Total mercury (Hg)	mg/L	< 0.00004	< 0.00004	NT	NT	0.005	NQ	0.005
Total lead (Pb)	mg/L	< 0.03	0.170	0.05	<0.03	0.05	NQ	0.05

Parameter	Units	16/07/2007	19/07/2007	Method 1	Method 2	Water Pollution Rules*	TTS 417:1993	TTS 547:1998 *
				09/10/2007	10/10/2007			
Cyanide	mg/L	< 0.010	< 0.010	NT	NT	0.01	NQ	0.01
Phenol Total	mg/L	<0.003	<0.003	NT	NT	0.1	NQ	0.1
Acute Toxicity (LC50)	ppm	509,000.0	NATE	NATE	NATE	NATE	NQ	NQ
Faecal Coliform (MPN mtd)	MPN/100ml	900	>1600	300	900	100	Nil	100
Total chromium (Cr)	mg/L	< 0.005	< 0.005	NT	NT	0.1	NQ	0.1

*	Guideline for Discharge to Environmentally Sensitive Areas
**	No Value due to interference within the sample matrix
NATE	No Acute Toxic Effects
NQ	Not Quoted
NR	No Release
NIAA	No Increase Above Ambient
NT	Not Tested

FAXED
08 NOV 2007

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Kaizen Lab

Analytical Division of Kaizen Environmental Services Inc.(Trinidad)

ANALYTICAL DATA REPORT

Client Company: KESTL- Projects Division **Date Received:** Oct 09 2007 **Lab File #:** 401170

Client Contact: Rishi Pragg **Date Reported:** Nov 08 2007

Client Project #: 07-7003

Sample ID: 401170-1, WELL 1

Date Sampled: Oct 09, 2007

Parameter Name	Units	Results
Biochemical Oxygen Demand (BOD)	mg/L	<6.0
Total Suspended Solids	mg/L	4660.0
Ammonia-N	mg/L	0.15
Total phosphorus (P)	mg P/L	0.14
Dissolved Iron	mg/L	11.0
Total copper (Cu)	mg/L	0.048
Total zinc (Zn)	mg/L	0.715
Total lead (Pb)	mg/L	0.08
Faecal Coliform (MPN mtd)	MPN/100ml	> 1600
Acute Toxicity (LC50)	ppm	NATE

Sample ID: 401170-2, WELL 2

Date Sampled: Oct 09, 2007

Parameter Name	Units	Results
Biochemical Oxygen Demand (BOD)	mg/L	<6.0
Total Suspended Solids	mg/L	3210.0
Ammonia-N	mg/L	0.30
Total phosphorus (P)	mg P/L	0.08
Dissolved Iron	mg/L	5.31
Total copper (Cu)	mg/L	0.031
Total zinc (Zn)	mg/L	0.410
Total lead (Pb)	mg/L	0.05
Faecal Coliform (MPN mtd)	MPN/100ml	300
Acute Toxicity (LC50)	ppm	NATE

Sample ID: 401170-3, Well 1

Date Sampled: Oct 10, 2007

Parameter Name	Units	Results
pH @ 25 °C		7.09
Temperature	Degrees Celcius	30.45
EC (water) @25 °C	mS/cm	1199.0
Biochemical Oxygen Demand (BOD)	mg/L	<6.0
Total Suspended Solids	mg/L	1376.70
Ammonia-N	mg/L	0.22
Total phosphorus (P)	mg P/L	0.25
Dissolved Iron	mg/L	0.006
Total copper (Cu)	mg/L	0.033
Total zinc (Zn)	mg/L	0.134
Total lead (Pb)	mg/L	< 0.03
Faecal Coliform (MPN mtd)	MPN/100ml	300
Acute Toxicity (LC50)	ppm	NATE

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Analytical Division of Kaizen Environmental Services Inc.(Trinidad)

Sample ID: 401170-4, Well 2
Date Sampled: Oct 10, 2007

Parameter Name	Units	Results
pH @ 25 °C		7.01
Temperature	Degrees Celcius	30.3
EC (water) @ 25 °C	mS/cm	2.1
Biochemical Oxygen Demand (BOD)	mg/L	<6.0
Total Suspended Solids	mg/L	1220
Ammonia-N	mg/L	0.25
Total phosphorus (P)	mg P/L	0.3
Dissolved Iron	mg/L	3.36
Total copper (Cu)	mg/L	0.0
Total zinc (Zn)	mg/L	0.149
Total lead (Pb)	mg/L	< 0.03
Faecal Coliform (MPN mtd)	MPN/100ml	900
Acute Toxicity (LC50)	ppm	NATE

Comments:

Test Methodologies*:
Acute Toxicity (water): Based on 96 hr test, USEPA 600-4:-9010 27F 1993
Ammonia (water): Based on Nessler Method, Hach no. 8038
BOD: Based on APHA 5210B
Dissolved Metals (water): Based on APHA 3030B & 3111B
EC (water): Based on APHA 2510B & Hach Manual
Fecal Coliforms (water): Based on Laboratory & Field Method APHA 2550B
pH (water): Based on APHA 4500-H+B
Temperature (water): Based on Laboratory & Field Method APHA 2550B
Total Metals (liquid): Based on APHA 3030 E & 3120 B
Total Phosphorus (water): Based on Persulphate Acid Digestion, Ascorbic Acid Method, APHA 4500 P B, E
Total Suspended Solids (water): Based on Filtration, Gravimetric, APHA 2540D

QA/QC Reviewed By:

*Detailed test methodologies and QA/QC data available upon request.

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Report

Baseline Surface Water Quality

Monitoring Report

July 04, 2007

Prepared for:

CariSal Limited

Presented By:

Kaizen Environmental Services (Trinidad) Limited

Pointe-a-Pierre

Trinidad, W.I

Project Manager:

_____

Sven Somair

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1. Introduction

Background

At a meeting on May 31, 2007, CariSal Limited ("CariSal") requested a proposal from Kaizen Environmental Services Trinidad Limited ("Kaizen"), for conducting baseline water quality monitoring at the proposed project area for a facility for the production of caustic soda, calcium chloride, hydrochloric acid and sodium hypochlorite. A proposal was submitted by Kaizen (*re: Kaizen Porposal No.: 07-0152*) and was subsequently accepted by CariSal.

This report documents the results of the baseline surface water quality in the vicinity of the project area.

Assignment Objective

The objectives of the assignment are:

- To conduct a surface water quality sampling and analysis program that will represent the ambient surface water quality within the study area of the proposed plant.

- To determine the ambient surface water quality to establish baseline surface water quality conditions.

METHOD STATEMENT

This chapter presents the sampling and analysis program implemented during the conduct of this assignment. The sampling event was conducted on May 30, 2007.

Sampling Locations

Surface water samples were collected at five locations. These locations were chosen to represent watercourses crossing or in the vicinity of the proposed plant and its facilities. These five locations were chosen in consultation with Carisal. The following table presents a description of the sampling locations.

TABLE 2-1: SURFACE WATER SAMPLING LOCATIONS

Location No.	Description	UTM Coordinates*
1	Along the LNG River, south of proposed plant site	0667743 1147850
2	Drain along western boundary of site, north of road along southern boundary	0667443 1147900
3	Southern drain along North Sea Road, near turn off to Phoenix Park Gas Processors Limited (PPGPL)	0666975 1147445
4	Drain east of Caribbean Nitrogen Company (CNC)	0667021 1148687
5	Drain along southern boundary of Desalcott.	0666943 1148901

* Accuracy of coordinate is approximately 10 feet (dependant of availability of satellites and cloud cover).

Sample Collection

Samples were collected via two methods: by hand and using a peristaltic pump. At locations where the sampling point was easily accessible, the sample was collected by hand. This involved placing the sampling bottle into the watercourse and allowing the water to flow into the bottle. As far as possible, solid material was not allowed to enter the bottle. This method was used at Sampling Locations 2 and 3.

In areas were the sample point was not accessible to collect the sample by hand, a peristaltic pump was used to collect the sample. The inlet side of the pump was placed into the watercourse and allowed to pump for approximately five minutes. This was done to flush out any contaminates that may be present in the pump and to prevent cross contamination. This process was done prior to sampling at each location. After flushing of the pump, the samples collected were placed in sample bottles. Samples collected at Locations 1, 4 and 5 were collected using this method.

All samples were collected in accordance with standard sampling methods. Samples collected were stored in specially prepared bottles, supplied by the laboratory, for the respective analysis to be conducted.

Sample Analysis

Samples were delivered to Kaizen laboratory, located in Pointe-a-Pierre, on the same day of sampling. The following table presents the parameter analyzed and the test method used for the analysis.

TABLE 2-2: PARAMETERS ANALYSED

Parameter	Test Method
Acute Toxicity (water)	Based on 96 hr test, USEPA 600-4:-9010 27F 1993
Ammonia (water)	Based on Nessler Method, Hach no. 8038
BOD	Based on APHA 5210B

Chloride (water)	Based on Argentometric Method, APHA 4500 CL-B
COD (water)	Based on APHA 5220D
Cyanide (water)	Based on Colorimetric Method, APHA 4500 CN-E
Dissolved Oxygen (water)	Based on Membrane Electrode Method, APHA 4500 O G
Fecal Coliforms (water)	Based on APHA 9221E
Hexavalent Chromium (water)	Based on Colorimetric Method APHA 3500-Cr B, Hach no. 8023 Observation
Oil and Grease (water)	Based on APHA 5520B, USEPA 1664
pH (water)	Based on APHA 4500-H+B
Sulphide (water)	Based on APHA 4500- S2- Methylene Blue Method, HACH no 8131
Temperature (water)	Based on Laboratory & Field Method APHA 2550B
Dissolved Metals (water)	Based on APHA 3030B & 3111B
Total Arsenic, Selenium (water)	Based on APHA 3114B
Total Mercury (water)	Based on APHA 3112B
Total Metals (water)	Based on APHA 3030E & 3111B
Total P (water)	Based on APHA 3030 E & 3120 B
Total Petroleum Hydrocarbon (water)	Based on Partition, Gravimetric USEPA 1664, APHA 5520B
Total Phenol (water)	Based on APHA 5530 B & C
Total Suspended Solids (water)	Based on Filtration, Gravimetric, APHA 2540D

The results of the analysis conducted are presented in Chapter 3; the laboratory reports are presented in Appendix 1.

Results of Analysis

This chapter presents the results of the site observations and the analysis conducted on the samples collected.

Site Observations

Weather Conditions

Sampling was conducted on May 30, 2007. At the time of sampling, the weather was sunny with a slight drizzle during the collection of the sample at Location 5. During the week prior to the sampling event, there were no significant periods of rainfall within or in the vicinity of the project area.

Sample Location 1

Sampling Location 1 was along the LNG River, which is located south of the proposed plant site. At the time of sampling, the water level was low, indicative of long periods of low or no rainfall. The watercourse was free flowing and there were no visible signs of garbage or oil in the watercourse. Aquatic life (fishes) was observed.

Sample Location 2

Sample Location 2 was near the south west corner of the site. This are was over grown with vegetation and there was no water flow. There were sign of decaying vegetation within the stagnant water and a foul smell was emanating from the watercourse.

Sample Location 3

Sample Location 3 was along the southern drain on North Sea Road. At the time of sampling, the water level was low but free flowing. There were visible signs of garbage and a slight oil sheen on the water surface was observed. No odors were detected during the sampling program at this location.

Sample Location 4

Sample Location 4 was at the bridge east of the CNC plant, along Pacific Avenue. The water level was low but free flowing. There were no visible signs of garbage or oil present in the watercourse. No odors were detected during the sampling program at this location.

Sample Location 5

Sample Location 5 is along the drain south of DesalCott. The water level in this drain was high, with a high flow rate. The water was opaque with a white to cream colour and emanated a foul odor. There were visible signs of garbage.

Analytical Results

The following table presents the results of the analysis conducted on the samples collected. At present, Trinidad and Tobago has no established guidelines for surface water quality. For comparison the criteria stipulated in the following laws and guidelines are included:

- Water Pollution Rules, 2001
- TTS 547: 1998 (Specification for Effluent from industrial Processes Discharged into the Environment)

Additionally, historical water quality data for the study area are included. The laboratory reports are presented in Appendix 1.

TABLE: 3-1: RESULTS OF SURFACE WATER ANALYSIS

Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Water Pollution Rules*	TTS 547:1998*	Historical Results**
pH @ 25 °C		7.34	6.48	8.62	7.36	6.18	6 – 9	6 - 9	6.1 – 7.0
Temperature	Degrees Celsius	31.1	29.7	33.4	29.7	29.9	35	35	22.79 – 29.31
Dissolved Oxygen	mg/L	3.10	0.59	4.38	3.10	1.02	< 4	NQ	4.4 - 9.1
Biochemical Oxygen Demand (BOD)	mg/L	<6.0	7.43	6.47	< 6.0	85.78	30	30	6.51 – 16.35
Chemical Oxygen Demand (COD)	mg/L	40	27	27	22	106.0	250	250	NA
Total Suspended Solids	mg/L	< 2	38.0	29.6	20.0	805.0	50	50	6.9 - 28
Oil and Grease	mg/L	18.3	< 1.6	4.0	1.8	5.8	10	10	0.107 – 0.444
Total Petroleum Hydrocarbons	mg/L	<1.6	< 1.6	3.2	1.3	1.8	25	25	NA
Ammonia-N	mg/L	0.31	0.45	2.05	0.70	2.13	10	10	NA
wat-phosphorus (as phosphate)	mg/L (as phosphate)	0.30	4.40	0.17	0.25	3.20	5	5	0.158 – 0.4215
Sulphide (H2S)	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	1	1	NA
Chloride	mg/L	53.88	32.61	53.88	46.79	68.06	250	250	NA
Hexavalent Chromium (Cr6+)	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	0.1	NA
Dissolved Iron	mg/L	0.258	0.539	0.038	0.106	1.17	3.5	3.5	615.2 – 1472.0
Total nickel (Ni)	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.5	0.5	23.0 – 38.1
Total copper (Cu)	mg/L	< 0.006	0.018	0.016	< 0.006	0.008	0.5	0.5	8.3 – 12.8
Total zinc (Zn)	mg/L	0.053	0.085	0.059	0.043	0.248	2	2	73.2 – 217.8
Total arsenic (As)	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.1	0.1	NA

Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Water Pollution Rules*	TTS 547:1998*	Historical Results**
Total cadmium (Cd)	mg/L	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.1	0.1	1.5 – 2.2
Total mercury (Hg)	mg/L	< 0.00004	< 0.00004	< 0.00004	< 0.00004	0.00089	0.01	0.01	BDL
Total lead (Pb)	mg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.1	0.1	25.4 – 31.4
Cyanide	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1	0.1	NA
Phenol Total	mg/L	0.015	0.010	0.006	0.012	0.005	0.5	0.5	NA
Acute Toxicity (LC50)	ppm	NATE	NATE	NATE	NATE	563000	NATE	NQ	NA
Faecal Coliform (MPN mtd)	MPN/100ml	> 1600	240	900	900	> 1600	400	400	500- ->= 16000
Total chromium (Cr)	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.5	0.5	1.25 – 61.4

* Guideline for discharge to Inland Surface Water
** Information Sources from the EIA for Proposed Steel Complex of Essar Group at Point Lisas
NATE No Acute Toxic Effects
NQ Not Quoted
NA Not Available

Report

Baseline Surface Water Quality

Monitoring Report

December 06, 2007

Prepared for:

CariSal Unlimited

Presented By:

Kaizen Environmental Services (Trinidad) Limited

Pointe-a-Pierre

Trinidad, W.I

Project Manager:

_____

Sven Somair

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2. Introduction

1.1 Background

At a meeting on May 31, 2007, CariSal Unlimited ("CariSal") requested a proposal from Kaizen Environmental Services Trinidad Limited ("Kaizen"), for conducting baseline water quality monitoring at the proposed project area for a facility for the production of caustic soda, calcium chloride, hydrochloric acid and sodium hypochlorite. A proposal was submitted by Kaizen (*re: Kaizen Proposal No.: 07-0152*) for one sampling event to be conducted at five locations. Kaizen submitted a subsequent proposal (*re: Kaizen Proposal No.: 07-0165*) for the continuation of the surface water sampling with the inclusion of a sixth sample location, to collected water quality data during the wet season. This new proposal was subsequently accepted by CariSal.

This report documents the results of the baseline surface water quality, wet season, in the vicinity of the project area.

1.2 Assignment Objective

The objectives of the assignment are:

- To conduct a surface water quality sampling and analysis program that will represent the ambient surface water quality, during the wet season, within the study area of the proposed plant.
- To determine the ambient surface water quality, during the wet season, to establish baseline surface water quality conditions.

2.0 METHOD STATEMENT

This chapter presents the sampling and analysis program implemented during the conduct of this assignment. The sampling event was conducted on May 30, 2007.

2.1 Sampling Locations and Schedule

Surface water samples were collected at six locations. These locations were chosen to represent watercourses crossing or in the vicinity of the proposed plant and its facilities. These six locations were chosen in consultation with CariSal and its environmental representatives. The following table presents a description of the sampling locations.

The initial set of samples was collected on July 19, 2007 at the six locations. A duplicate set of samples was collected on July 30, 2007 at the same six locations.

TABLE 2-1: SURFACE WATER SAMPLING LOCATIONS

Location No.	Description	UTM Coordinates*
1	Along the LNG River, south of proposed plant site	0667743 1147850
2	Drain along western boundary of site, north of road along southern boundary	0667443 1147900
3	Southern drain along North Sea Road, near turn off to Phoenix Park Gas Processors	0666975 1147445

TABLE 2-1: SURFACE WATER SAMPLING LOCATIONS		
Location No.	Description	UTM Coordinates*
	Limited (PPGPL)	
4	Drain east of Caribbean Nitrogen Company (CNC)	0667021 1148687
5	Drain along southern boundary of DESALCOTT.	0666943 1148901
6	Drain south of road on southern boundary of site, near the Phoenix Park Intermediate Station.	0667443 1147895

* Accuracy of coordinate is approximately 10 feet (dependant of availability of satellites and cloud cover). UTM coordinates are based on WGS Datum.

2.2 Sample Collection

Samples were collected via two methods: by hand and using a peristaltic pump. At locations where the sampling point was easily accessible, the sample was collected by hand. This involved placing the sampling bottle into the watercourse and allowing the water to flow into the bottle. As far as possible, solid material was not allowed to enter the bottle. This method was used at Sampling Locations 2 3 and 6.

In areas where the sample point was not accessible to collect the sample by hand, a peristaltic pump was used to collect the sample. The inlet side of the pump was placed into the watercourse and allowed to pump for approximately five minutes. This was done to flush out any contaminates that may be present in the pump and to prevent cross contamination. This process was done prior to sampling at each location. After flushing of the pump, the samples collected were placed in sample bottles. Samples collected at Locations 1, 4 and 5 were collected using this method.

All samples were collected in accordance with standard sampling methods. Samples collected were stored in specially prepared bottles, supplied by the laboratory, for the respective analysis to be conducted.

2.3 Sample Analysis

Samples were delivered to Kaizen laboratory, located in Pointe-a-Pierre, on the same day of sampling. The following table presents the parameter analyzed and the test method used for the analysis.

Table 2-2: PARAMETERS ANALYSED	
Parameter	**Test Method**
Acute Toxicity (water)	Based on 96 hr test, USEPA 600-4: -9010 27F 1993
Ammonia (water)	Based on Nessler Method, Hach no. 8038
BOD	Based on APHA 5210B
Chloride (water)	Based on Argentometric Method, APHA 4500 CL-B
COD (water)	Based on APHA 5220D
Cyanide (water)	Based on Colorimetric Method, APHA 4500 CN-E
Dissolved Oxygen (water)	Based on Membrane Electrode Method, APHA 4500 O G
Fecal Coliforms (water)	Based on APHA 9221E

Table 2-2: PARAMETERS ANALYSED	
Parameter	**Test Method**
Hexavalent Chromium (water)	Based on Colorimetric Method APHA 3500-Cr B, Hach no. 8023 Observation
Oil and Grease (water)	Based on APHA 5520B, USEPA 1664
pH (water)	Based on APHA 4500-H+B
Sulphide (water)	Based on APHA 4500- S2- Methylene Blue Method, HACH no 8131
Temperature (water)	Based on Laboratory & Field Method APHA 2550B
Dissolved Metals (water)	Based on APHA 3030B & 3111B
Total Arsenic, Selenium (water)	Based on APHA 3114B
Total Mercury (water)	Based on APHA 3112B
Total Metals (water)	Based on APHA 3030E & 3111B
Total P (water)	Based on APHA 3030 E & 3120 B
Total Petroleum Hydrocarbon (water)	Based on Partition, Gravimetric USEPA 1664, APHA 5520B
Total Phenol (water)	Based on APHA 5530 B & C
Total Suspended Solids (water)	Based on Filtration, Gravimetric, APHA 2540D

The results of the analysis conducted are presented in Chapter 3; the laboratory reports are presented in Appendix 1.

3.0 Results of Analysis

This chapter presents the results of the site observations and the analysis conducted on the samples collected.

3.1 Site Observations

3.1.1 Weather Conditions

The following presents a description of the weather conditions prior to each sampling event.

July 19, 2007

Sampling was conducted representative of the wet period on July 19, 2007. At the time of the sampling, there were periods of rain. During the week prior to this sampling event, periods of heavy rain were experienced within the vicinity of the project area.

July 30, 2007

Sampling was conducted representative of the wet period on July 30, 2007. This sampling event represented a repeat of the wet period sampling event conducted on July 19, 2007. At the time of the sampling, weather conditions were sunny. During the week prior to this sampling event, periods of heavy rain were experienced within the vicinity of the project area.

3.1.2 Sample Locations

The following is a description of the sampling locations during each sampling event.

Sample Location 1

Sampling Location 1 was along the LNG River, which is located south of the proposed plant site.

During both wet period sampling events conducted on July 19 and repeated on July 30, the river water level was high and the water was free flowing. Evidence of garbage was observed on July 19, but not on July 30. During both sampling events, there were no visible signs of oil. Aquatic life (fishes) was observed at both wet period sampling events.

Sample Location 2

Sample Location 2 was near the south west corner of the site, north of the road along the southern boundary of the site.

During the two wet period sampling events, the area around the sampling location was waterlogged and there was evidence to suggest that water from the watercourse had overflowed onto the surrounding area. During the sampling event conducted on July 19, there were visible signs of garbage material. However, no garbage was observed during the sampling event on July 30.

Sample Location 3

Sample Location 3 was along the southern drain on North Sea Road, near the entrance to Phoenix Park Gas Processors Limited.

At both sampling events, the water was free flowing. There were no visible signs of garbage and no odors were detected during the two sampling events at this location.

Sample Location 4

Sample Location 4 was at the bridge east of the CNC plant, along Pacific Avenue.

The water was free flowing. There were visible signs of garbage during the sampling event on July 19, but no garbage was observed on July 30. No odors were detected during the two sampling events at this location.

Sample Location 5

Sample Location 5 is along the drain south of DesalCott.

The water level in this drain was high, with a high flow rate. The water was opaque with a white to cream colour and emanated a foul odor. There were no visible signs of garbage.

Sample Location 6

Sample Location 6 is located south of the road along the southern boundary of the site. The sample was collected north of the Phoenix Park Intermediate Station.

At the time of sampling, the water was pooled in the north of the Phoenix Park Intermediate Station, with a slow drain off. There were no signs of solid waste or oil sheens at the sampling location during both sampling events, nor were any odors detected.

3.2 Analytical Results

The following tables presents the results of the analysis conducted on the samples collected. At present, Trinidad and Tobago has no established guidelines for surface water quality. For comparison the criteria stipulated in the following laws and guidelines are included:

- Water Pollution Rules, 2001
- TTS 547: 1998 (Specification for Effluent from Industrial Processes Discharged into the Environment)

Additionally, historical water quality data for the study area are included. The laboratory reports are presented in Appendix 1.

TABLE: 3-1: RESULTS OF SURFACE WATER ANALYSIS CONDUCTED ON JULY 19, 2007

Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Sample Location 6	Water Pollution Rules*	TTS 547:1998*	Historical Results**
pH @ 25 °C		6.41	6.66	10.03	7.46	7.22	6.68	6 – 9	6 - 9	6.1 – 7.0
Temperature	Degrees Celsius	24.2	25.6	25.7	25.5	25.3	25.5	35	35	22.79 – 29.31
Dissolved Oxygen	mg/L	1.17	3.48	3.73	3.82	3.75	2.42	< 4	NQ	4.4 - 9.1
Biochemical Oxygen Demand (BOD)	mg/L	<6	<6	18.36	<6	<6	<6	30	30	6.51 – 16.35
Chemical Oxygen Demand (COD)	mg/L	18	36	32	22	27	24	250	250	NA
Total Suspended Solids	mg/L	1660.0	2.0	42.0	110.0	10.0	12.0	50	50	6.9 - 28
Oil and Grease	mg/L	<1.6	4.8	2.1	<1.6	<1.6	4.3	10	10	0.107 – 0.444
Total Petroleum Hydro-carbons	mg/L	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	25	25	NA
Ammonia-N	mg/L	0.53	0.51	0.88	0.48	0.67	0.38	10	10	NA
wat-phosphorus (as phosphate)	mg/L (as phosphate)	0.34	0.50	0.32	0.64	0.48	0.44	5	5	0.158 – 0.4215
Sulphide (H2S)	mg/L	<0.010	<0.010	0.157	<0.010	<0.010	<0.010	1	1	NA
Chloride	mg/L	25.52	25.52	25.52	11.34	25.52	25.52	250	250	NA

TABLE: 3-1: RESULTS OF SURFACE WATER ANALYSIS CONDUCTED ON JULY 19, 2007

Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Sample Location 6	Water Pollution Rules*	TTS 547:1998*	Historical Results**
Hexavalent Chromium (Cr6+)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	0.1	NA
Dissolved Iron	mg/L	1.17	3.53	0.484	2.08	0.910	3.29	3.5	3.5	615.2 – 1472.0
Total nickel (Ni)	mg/L	0.081	<0.006	<0.006	0.015	<0.006	<0.006	0.5	0.5	23.0 – 38.1
Total copper (Cu)	mg/L	0.063	0.012	0.011	0.017	0.010	0.007	0.5	0.5	8.3 – 12.8
Total zinc (Zn)	mg/L	0.441	0.059	0.094	0.212	0.102	0.105	2	2	73.2 – 217.8
Total arsenic (As)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	0.1	NA
Total cadmium (Cd)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.1	0.1	1.5 – 2.2
Total mercury (Hg)	mg/L	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	0.01	0.01	BDL
Total lead (Pb)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.1	25.4 – 31.4
Cyanide	mg/L	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	0.1	0.1	NA
Phenol Total	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.5	0.5	NA
Acute Toxicity (LC50)	ppm	750,000.0	175,000.0	625,000.0	NATE	NATE	250,000.0	NATE	NQ	NA
Faecal Coliform (MPN mtd)	MPN/100mL	>1600	>1600	900	>1600	>1600	900	400	400	500- ->= 16000
Total chromium (Cr)	mg/L	0.031	<0.005	<0.005	<0.005	<0.005	<0.005	0.5	0.5	1.25 – 61.4

* Guideline for discharge to Inland Surface Water
** Information Sources from the EIA for Proposed Steel Complex of Essar Group at Point Lisas
NATE No Acute Toxic Effects
NQ Not Quoted
NA Not Available

TABLE: 3-2: RESULTS OF SURFACE WATER ANALYSIS CONDUCTED ON JULY 30, 2007

Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Sample Location 6	Water Pollution Rules*	TTS 547:1998*	Historical Results**
pH @ 25 °C		7.17	6.87	7.78	6.78	7.05	6.87	6 – 9	6 - 9	6.1 – 7.0
Temperature	Degrees Celsius	29.0	27.5	30.5	27.6	32.5	27.5	35	35	22.79 – 29.31
Dissolved Oxygen	mg/L	4.99	0.8	3.5	5.01	1.54	0.8	< 4	NQ	4.4 - 9.1

TABLE: 3-2: RESULTS OF SURFACE WATER ANALYSIS CONDUCTED ON JULY 30, 2007										
Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Sample Location 6	Water Pollution Rules*	TTS 547:1998*	Historical Results**
Biochemical Oxygen Demand (BOD)	mg/L	< 6	< 6	<6	< 6	> 16.74	<6	30	30	6.51 – 16.35
Chemical Oxygen Demand (COD)	mg/L	23	27	26	31.0	77	27	250	250	NA
Total Suspended Solids	mg/L	53.0	28.0	5.0	5.0	58.0	28.0	50	50	6.9 - 28
Oil and Grease	mg/L	< 1.6	< 1.6	<1.6	< 1.6	< 1.6	<1.6	10	10	0.107 – 0.444
Total Petroleum Hydrocarbons	mg/L	< 1.6	< 1.6	<1.6	< 1.6	< 1.6	<1.6	25	25	NA
Ammonia-N	mg/L	0.09	0.34	0.42	0.13	0.17	0.34	10	10	NA
wat-phosphorus (as phosphate)	mg/L (as phosphate)	0.25	0.51	0.34	0.31	< 0.01	0.51	5	5	0.158 – 0.4215
Sulphide (H2S)	mg/L	< 0.01	< 0.01	<0.01	< 0.01	< 0.01	<0.01	1	1	NA
Chloride	mg/L	36.87	22.69	79.41	29.78	58.14	22.69	250	250	NA
Hexavalent Chromium (Cr6+)	mg/L	< 0.01	< 0.01	<0.01	< 0.01	< 0.01	<0.01	0.1	0.1	NA
Dissolved Iron	mg/L	1.12	1.18	0.134	0.361	0.316	1.18	3.5	3.5	615.2 – 1472.0
Total nickel (Ni)	mg/L	< 0.006	< 0.006	<0.006	< 0.006	< 0.006	<0.006	0.5	0.5	23.0 – 38.1
Total copper (Cu)	mg/L	< 0.006	< 0.006	<0.006	0.028	< 0.006	<0.006	0.5	0.5	8.3 – 12.8
Total zinc (Zn)	mg/L	0.102	0.113	0.126	0.111	< 0.095	0.113	2	2	73.2 – 217.8
Total arsenic (As)	mg/L	< 0.02	< 0.02	<0.02	< 0.02	< 0.02	<0.02	0.1	0.1	NA
Total cadmium (Cd)	mg/L	< 0.003	< 0.003	<0.003	< 0.003	< 0.003	<0.003	0.1	0.1	1.5 – 2.2
Total mercury (Hg)	mg/L	< 0.00004	< 0.00006	0.00005	0.00007	0.00015	0.00006	0.01	0.01	BDL
Total lead (Pb)	mg/L	< 0.03	< 0.03	<0.03	< 0.03	< 0.03	<0.03	0.1	0.1	25.4 – 31.4
Cyanide	mg/L	< 0.01	< 0.01	<0.01	< 0.01	< 0.01	<0.01	0.1	0.1	NA
Phenol Total	mg/L	0.053	0.021	0.027	0.013	0.013	0.021	0.5	0.5	NA

TABLE: 3-2: RESULTS OF SURFACE WATER ANALYSIS CONDUCTED ON JULY 30, 2007										
Parameter	Units	Sample Location 1	Sample Location 2	Sample Location 3	Sample Location 4	Sample Location 5	Sample Location 6	Water Pollution Rules*	TTS 547:1998*	Historical Results**
Acute Toxicity (LC50)	ppm	NATE	NATE	NATE	NATE	NATE	NATE	NATE	NQ	NA
Faecal Coliform (MPN mtd)	MPN/100ml	> 1600	240	900	1600	> 1600	240	400	400	500- ->= 16000
Total chromium (Cr)	mg/L	< 0.005	< 0.005	<0.005	< 0.005	< 0.005	<0.005	0.5	0.5	1.25 – 61.4

* Guideline for discharge to Inland Surface Water
** Information Sources from the EIA for Proposed Steel Complex of Essar Group at Point Lisas
NATE No Acute Toxic Effects
NQ Not Quoted
NA Not Available

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SOIL

Document
CariSal Calcium Carbide Plant Point Lisas – Geotechnical Investigation Report – July 2007

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CARISAL CALCIUM CHLORIDE PLANT
POINT LISAS

GEOTECHNICAL INVESTIGATION REPORT

EISL
Earth Investigation Systems Ltd

July 2007

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INTRODUCTION

CariSal Limited through Mr. Carlos Bernard of TTeK Project Managers commissioned Earth Investigation Systems Ltd., to conduct geotechnical investigations at Plot 4A of the New Point Lisas Industrial Estate in Couva. The result of this investigation is to determine the nature of the ground conditions and soil parameters which would be used to facilitate the foundation designs for the proposed Calcium Chloride Facility.

The findings of this geotechnical investigation include the following:

- Desktop Study: information obtained from photographs; maps – site, topographic, soils, hydrogeologic.
- Site Reconnaissance: visual inspection of site, borehole sampling.
- Laboratory Testing: testing of borehole samples.
- Conclusions and Recommendations: a holistic analysis of information obtained from the Desktop Study, Site Reconnaissance and Laboratory Tests.

PROPOSED INFRASTRUCTURE

Carisal Limited intends to build a Calcium Chloride Plant with a production capacity of 100, 000 metric tons per year**.**

The major facilities include:

- Limestone and General Storage Area
- Chlor-Alkalli-Plant
- Process Water Storage Tanks
- Boilers
- Administration Building
- Sewage Plant

SITE CHARACTERISTICS

Location

The proposed site is located on an agricultural plot of land previously used for sugar cane cultivation, which is Plot 4A of the New Industrial Estate in Couva as illustrated in Figure 1.

The site is L-shaped and measures approximately 12.5 hectares and is bounded to the north by an earthen drain, the south by North Sea Drive East extension.

Access is gained from the Southern Main Road travelling east onto North Sea drive in the vicinity of TRINGEN Point Lisas.

Topography & Drainage

The site is located on relatively flat to gently undulating land with a general slope from East to West with the central and northern portions being the lowest points. The topographic survey for this site indicates that the ground surface elevation over the site varies between 5 m and 7 m above mean sea level and lies approximately 1 km from the west coast of Trinidad. It is likely therefore that water table conditions at the site can be influenced by tidal variations.

The portion of land bounded by the earthen drain, and the western boundary are lowest in elevation as was evident from our site reconnaissance with water ponding in these areas during the dry season.

The land was recently used to cultivate sugar cane. Due to the cultivation, the slope of the land has been designed to cater for drainage along specific routes culminating at specific points (wells) as some two (2) heavily desiccated circular areas approximately 2 m in diameter were seen.

However, a 'wetland' area can be seen along the western edge of the site. This wetland is somewhat bacteria-infested and gives off a pungent, organic odor accounted for by the presence of cows which use this area as a grazing site. The stagnation of this water however may be accounted for by the impervious layer which was used to line the disused railway, or, it may be due to the change in soil classification from 231.B1 Couva sandy clay loam to 241.B1 Las Lomas fine sandy loam as illustrated on the soils map (Figure: 3).

Earthen Drain Forming Northern Boundary of Site, Water Level as seen after moderate rainfall.

Geology & Geomorphology

The geology of the site is significant insofar as it places the proposed site at a point where the geological strata transitions from the recent alluvial geomorphological landform to the Talparo Formation of the Pleistocene era as illustrated in Figure: 2

Soils

The information contained in the Agricultural Soils and Land Capability Survey Maps of Trinidad and Tobago (The Ministry of Agriculture and UWI, 1972) provides an excellent basis for the identification and classification of soils for engineering purposes. In these, soils are categorised with respect to their lithological and geomorphological characteristics that can typically be related to their engineering soil properties (plasticity, activity, and volume change potential) and by extension, expected field characteristics (slope instability and erosion potential) based on in-situ and environmental conditions.

The site was located on these maps and it was found that the soil types encountered fell within

- Group A4 which consists of deep alluvial soils with restricted internal drainage classified 231B1 Couva scl (sandy clay alluvium lithology);
- Group B1 which consists of terrace soils with free internal drainage under classification 241B1 Las Lomas fsl (levee sand lithology) and;
- Group C2 consisting of soils from intermediate uplands with restricted drainage classified 177 DC2 Ecclesville clay (clay shale lithology) Table 1 and Figure 3

Climate

The mean annual rainfall is approximately 1500 mm which is equal to half the maximum value for Trinidad (3800 mm) (Figure: 4). The mean annual moisture balance for this area is given by a Thorntwaithe Moisture Index (TMI) of 0 - 10, which means that the area experiences at least 2-4 months of very dry weather.

Existing Structures

Currently there are no exiting structures or evidence of any previous structures located on the site, however electrical overhead power lines run along the southern boundary of the site.

Table 1: Soil classification: CariSal Point Lisas

Soil Group		Classification Slope & Erosion Category	Lithology	Plasticity Index (%)	Volume Change Potential
A4	Deep alluvial soils with restricted internal drainage	231B1, Couva Sandy Clay Loam	Alluvium	Low to medium	Low to Medium
B1	Terrace Soils with free internal drainage	241B1 Las Lomas, Fine Sandy Loam	Levee Sand	Low to medium	Low to Medium
C2	Soils of the intermediate uplands with restricted internal drainage	177 DC2 Ecclesville Clay	Clay Shale	Medium- High	Medium- High

Slope Categories: A 0-2°
B 2-5°
C 5-10°
D 10-20°
E 20-30°
F > 30°

Erosion Categories: 0 - No apparent erosion
1 - Slight < 10% of topsoil lost
2 - Moderate > 10% of topsoil lost
3 - Severe all topsoil lost

FIELD AND LABORATORY INVESTIGATIONS

Field Investigation

Borehole investigations were carried out from May 17, 2007 to the 9th June 2007. Sixteen (16) boreholes were carried out as indicated in Figure 5. The investigation was started to the end of the dry season and continued into the beginning of the wet season. This lead to delays as 1.5 weeks was lost due to heavy rainfall.

The borehole locations were chosen by the client and located by L&S Surveying, clearly identified by a wooded stake and a borehole number. The borehole coordinates were not provided.

The ground investigation will facilitate interpretation of soil layering and groundwater conditions that might be expected on this site. All boreholes were carried out using a combination of conventional wash and dry boring techniques, in conjunction with standard penetration testing (SPT). The depth of boreholes are summarised in Table 2 and detailed borehole logs are presented in Appendix B.

Water Levels

Our drilling records indicate that a relatively high water table was observed during the drilling process as well as 24 hours after. These values were recorded as seen in Table 2 below.

Table 2: Location and Water Levels of Borehole

BH #	PROPOSED BUILDING	Coordinates E,N	DATE 2007	DEPTH OF BH (m)	WATERLEVEL (m)	
					AFTER DRILLING	24HRS AFTER
1	Administration Area	667937 1148219	May 18	31.10	1.20	0.91
2	Administration Area	667801 1148210	May 19	24.09	2.44	0.91
3	-	667664 1148184	May 21	31.10	3.66	1.50
4	Septic Tank		May 22	31.10	Surface	Surface
5	Water Ponding	667586 1148097	May 30	26.52	0.91	Surface
6	-	667743 1148090	May 23	31.10	4.57	1.50
7	Storage –Plant Site	667732 1148043	May 28	31.10	-	2.10
8	Plant Boundary	667688 1148043	May 29	31.10	3.66	1.50
9	Plant Boundary	667660 1147975	June 9	31.10	3.66	-
10	Plant Boundary	667597 1148006	June 1	29.57	3.66	1.80
11	Plant Boundary	667578 1148050	June 8	26.52	2.44	1.80
12	Plant Boundary	667573 1147956	June 5	31.10	3.66	2.40
13	Plant Boundary	667664 1147941	June 11	31.10	4.57	-
14	Plant Boundary	667729 1147970	June 10	31.10	3.66	-
15	Plant Boundary	667777 1147928	May 17	31.10	2.13	1.50
16	Entrance	667465 1147942	June 6	31.10	1.83	Surface

Findings of Field Investigations

- The borehole investigation was started in the dry season. The ground surface was severely desiccated with shrinkage cracks as normally observed with expansive clays.

These cracks are greater than 3" wide and extended to depths as great as 1 m indicating the depth of the moisture variation zone which affects shallow foundations.

- Visual inspection of the samples recovered suggests that the soil within the depth investigated consists mainly of sandy silty clays with organics and pieces of wood. This is consistent with both the geological and soils mapping illustrated in previous sections.

- During the site reconnaissance we observed that the western end of the site was very wet and swampy with water ponding on the surface. This observation was very unusual as no rainfall was recorded for over a week and the earthen drain forming the northern boundary was completely dry. This indicates that this area is prone to flooding and will have to be FILLED.

Cows Grazing in Wet Swampy Area. Picture taken behind borehole 5.

Laboratory Investigations

Laboratory investigations include:-

- Visual Identification
- Water Content
- Textural Identification
- Atterberg Limits
- Grain Size Analysis
- Unconfined Compressive Strength Test
- Consolidation Testing

All test results are presented in Appendix C.

Findings of Laboratory Investigations

1. Visually the soil samples retrieved consisted primarily of light brown to brown and grey sandy silty clays with wood fragments and other organics down to 14 m.
2. In order to evaluate the in situ moisture content, the mean and standard deviation of moisture content was plotted for all boreholes as seen in Figure 7. Based on this graph it can be seen that there is a variation of moisture content with depth, the largest variation at approximately 11 m where wood fragments were retrieved in the samples. This is a possible indication of the old swamp level.
3. The variation of moisture as it relates to the plastic limit indicates that the insitu conditions suggest the soils to be wetter than the plastic limit (by > 8%) with depth. Atterberg Limits tests conducted show a high degree of variation of P.I. within the soil strata. This again reflects the variability in composition of the site soils as non-plastic sandy silts alternate with silty clays of medium plasticity.

In the following section, the soil profile is further analysed in respect of the results of the Standard Penetration Test.

ANALYSIS

Soil Profile

The average and standard deviation of the results of the SPT conducted during the borehole investigation is plotted to obtain an idealized stiffness/strength profile over depth. The distribution of SPT with depth along with inferred stratification from the boreholes is illustrated in Figures 6.

From the borehole idealization Figure 6 it can be appreciated that the site can be characterized into three general soil horizons within the depth investigated. These horizons vary primarily with respect to consistency and composition with depth.

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Horizon I, 0.0 m to 2.0 m: This horizon was made up primarily of light brown to dark highly Fissured Silty Clay with roots and organics. The average SPT is <10 blows/ft indicating soil of soft consistency.

Horizon II, 2.0 m to 15.0 m: This horizon was made up of the same soil as the previous layer however pieces of wood and more organics with shells were present with an intermediate layer of sand and gravel The average SPT was 20 blows/ft indicating soil of medium to stiff consistency. Possible remnants of old coastal swamp surface.

Horizon III, 15.0 m to 32.0 m: This horizon was primarily made up Stiff to very Stiff to Hard Dark Grey Sandy Silty Clay with presence of some shells with an range of SPT of 25 -40 blow/ft.

Water Table

Based on the water levels recorded for both initial and 24 hour periods and the observed flooding after intense rainfall we can recommend that a water table at ground surface be assumed for design purposes as a possible worst case scenario.

Soil Parameters

Based on SPT correlations and laboratory investigations, we have estimated the undrained and drained strength parameters as indicated in Table 3. The drained strength parameters (effective strength) are based on correlations with Plasticity Index in the foundation bearing layer.

The analysis suggests that the site is relatively uniform based on the depths investigated.

Table 3: Strength Parameters from SPT and Laboratory testing

Layer	Soil Hor.	Depth (m)	Average SPT (blows/ft)	Undrained Strength S_u (kN/m^2)	γ (kN/m^3)	Effective Strength			PI (%)
						Correlation with PI			
						Φ'_{Peak} (^{0})	Φ'_{REM} (^{0})	Φ'_{RES} (^{0})	
1	I	0.0 – 2.0	8	35	17	26	17	8	35
2	II	2.0 – 15.0	20	75	18	25	15	8	40
3	III	15 – 32.0	25	125	18	23	12	7	61

Foundation Design

Our foundation analyses suggest that soils at shallow depth (< 2m) are unlikely to adequately support high foundation pressures without experiencing high load related settlements; however they may still provide adequate support for lighter structures outside of the swampy water logged areas.

Based on the loads normally associated with industrial plants, deep foundation options will be investigated for the Administration and Plant Structures.

Shallow Foundations

Bearing Capacity

The undrained bearing capacity is based on the Terzaghi bearing capacity where undrained strength is estimated based on SPT N values of from laboratory strength test on undisturbed samples. The drained of effective strength bearing capacity is also used where the effective strength parameters is determined via correlation with Plasticity Index (PI) or through drained direct shear tests.

This analysis suggests an allowable bearing capacity of 50 kN/m$^{2.}$ However the recommended allowable capacity is based on the long term settlements associated with this level of stress. This shall be examined in the following section.

Settlement

Estimates of long term building settlement for shallow foundations were derived based on Consolidation Settlement Theory. These tests are still ongoing and will be presented as an addendum to this report.

Settlements for a range of foundations widths based on inferred consolidation parameters from moisture variation (Lambe and Whitman) for an applied stress of 50 kN/m^2 were calculated at a design depth of 0.5 m. The settlement is presented below

Table 4: Foundation Settlement for an Applied Stress 50 kN/m^2

Foundation Width (m)	Applied Stress kN/m^2	Settlement (mm)
4	50	268
5	50	294
6	50	315
7	50	332
8	50	348

Deep Foundations

Axial Pile Capacity

The allowable pile capacity with depth for a 400 mm square driven and 600 mm diameter augered pile were calculated and presented in Figure 8.

It is recommended that pile load tests be carried out to determine the deformation under working loads, and to verify pile capacities.

Site Development

From the site layout it is observed that the site office (temporary structure) will be constructed within the Swampy Water Logged Area.

The soil improvement that can be recommended in these environments are some type of internal drainage system such as vertical sand or wick drains, where the wick drain system could be the more economical and more easily implemented system. However, this would largely depend on the Contractor's resources and experience in these technologies.

The option to remove some or all of these soils would also be problematic, as the disposal of saline soils could become an environmental challenge. This option cannot be recommended

Based on construction time and the nature of this area we recommended the site office be constructed on an Engineering FILL Pad (minimum 1m) with a free draining Sand and Gravel Layer at its base to allow for consolidation.

Seismicity

The seismicity of Trinidad is given in Appendix D

CONCLUSIONS AND RECOMMENDATIONS

1. The site is located on an agricultural plot of land previously used for sugar cane cultivation, which is Plot 4A of the New Industrial Estate in Couva as illustrated in Figure 1

2. The topographic survey for this site indicates that the ground surface elevation over the site varies between 5 and 7 m above mean sea level and lies approximately 1 km from the west coast of Trinidad. It is likely therefore that water table conditions at the site can be influenced by tidal variations

3. The soils map of Trinidad indicates that the site is located in recent alluvium deposits such as the Couva sandy clay alluvium. This is consistent with our field and laboratory observations which suggest normally consolidated, highly compressible soils.

4. Field observations also indicated the ground surface to be highly desiccated suggesting the shrink-swell nature of the clays. Site measurements indicated 3-4 inch cracks.

5. Wood fragments were retrieved from borehole samples to a depth of approximately 11 m. This is a possible indication of the old swamp level.

6. The Atterberg Limits tests and grainsize distributions conducted suggest that these soils are mainly of intermediate to high plasticity and are likely to have a intermediate to high volume change potential. The classification into which the majority of soils fall is silty Clays.

7. Settlements of shallow foundations were estimated using a range of foundation widths for an applied stress of 50 kN/m^2 as outlined in Table 4. However, for the heavier structures, piled foundations are recommended.

8. The allowable pile capacity with depth for a 400 mm square driven and 600 mm diameter augered Pile were calculated and presented in Figure 8. It is recommended that pile load tests be carried out to determine the deformation under working load, and to verify pile capacities.

9. Based on the water levels recorded for both initial and 24 hour periods and the observed flooding after intense rainfall we can recommend that a water table at ground surface be assumed for design purposes as a possible worst case scenario.

10. The soil improvement that can be recommended in these environments are some type of internal drainage system such as vertical sand or wick drains, where the wick drain system could be the more economical and more easily implemented system. However, this would largely depend on the Contractor's resources and experience in these technologies. The option to remove some or all of these soils would also be problematic, as the disposal of these soils could become an environmental challenge. This option cannot be recommended

11. Based on the nature of this area we recommended that lightly loaded structures be constructed on a engineering fill pad (minimum 1m) with a free draining sand and gravel layer at its base to allow for consolidation.

12. The seismicity of Trinidad is given in Appendix D.

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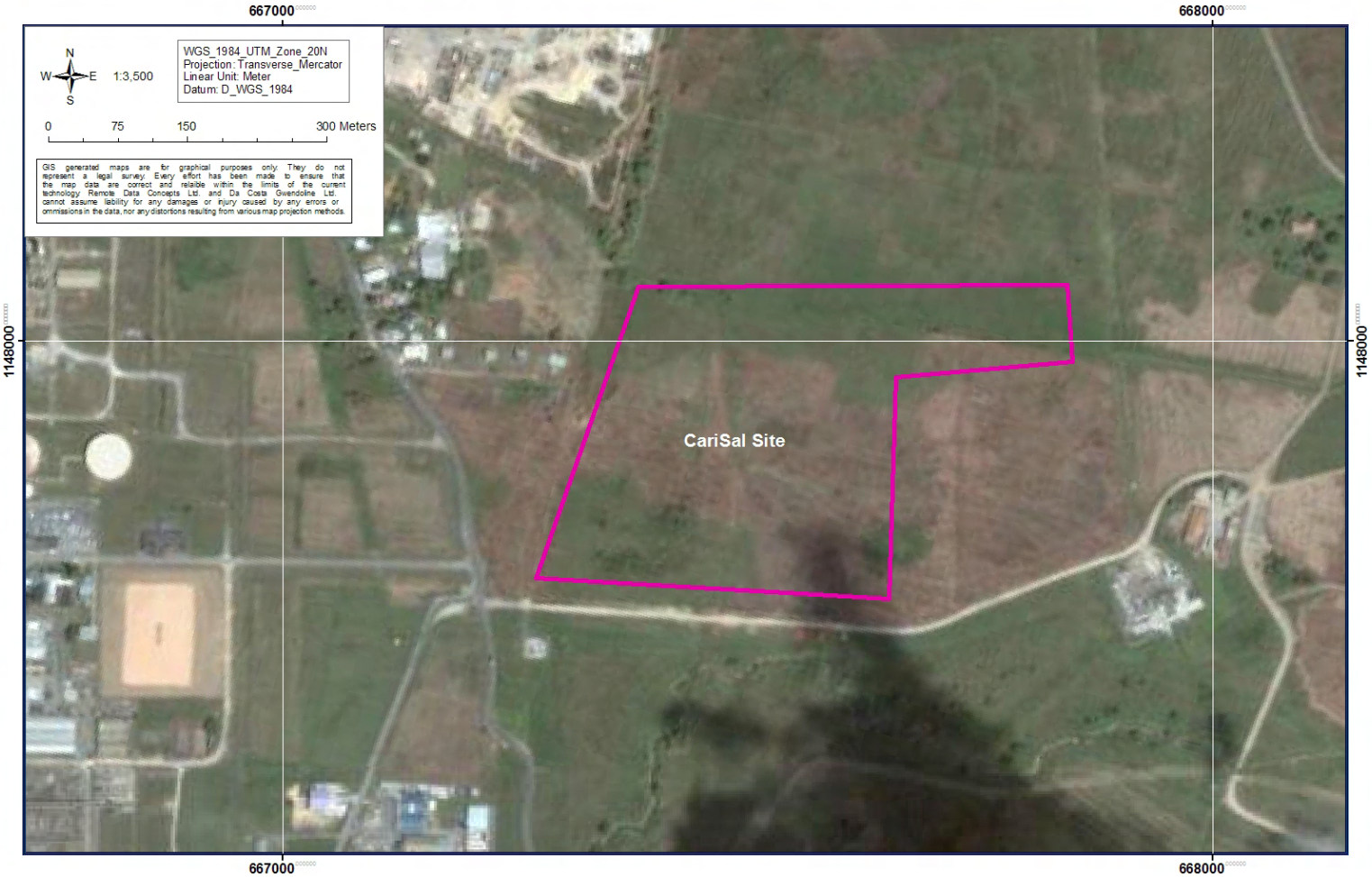


Figure 1 – Location of CARISAL, Aerial photo courtesy Google Earth (2007)

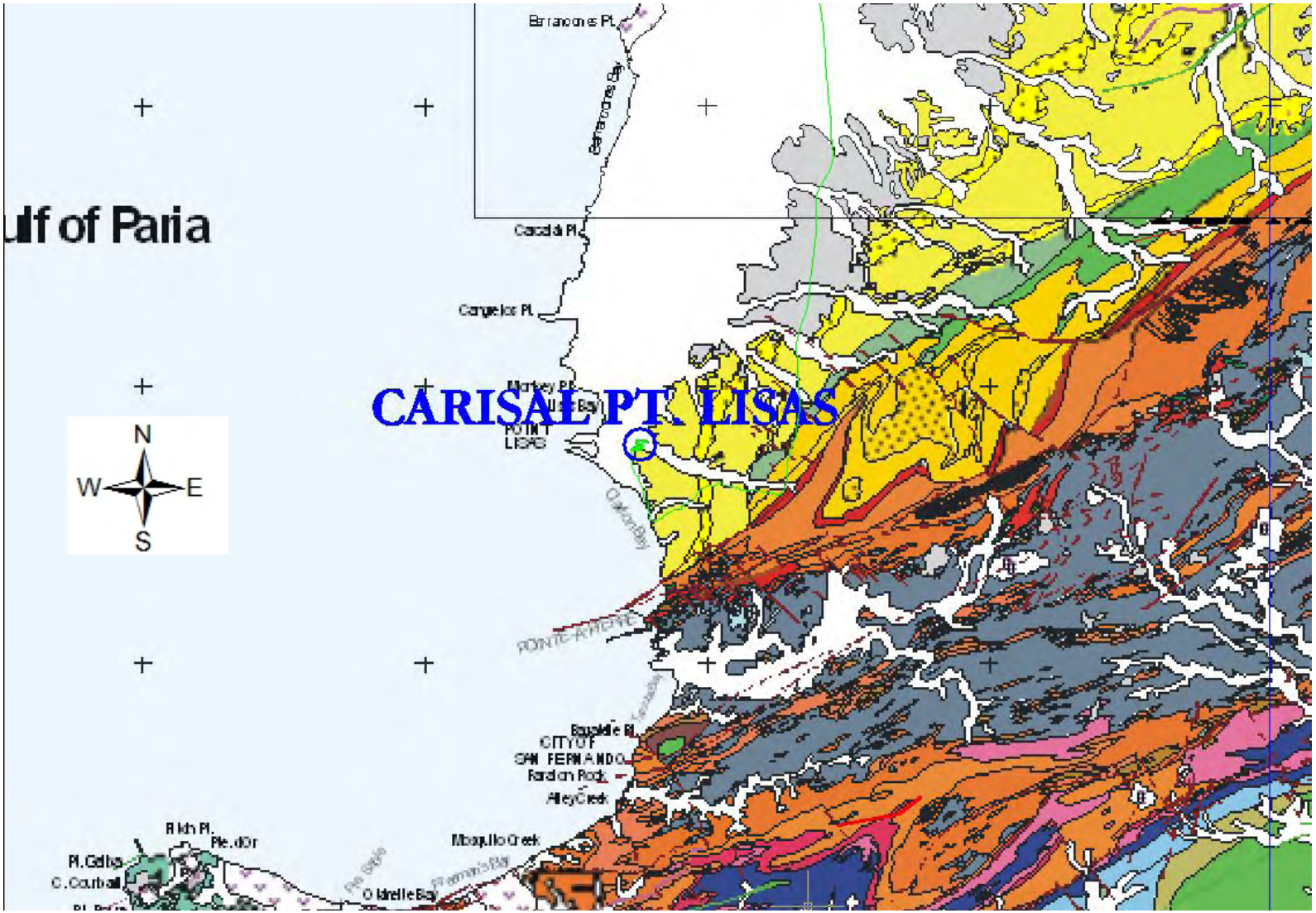


Figure 2 - Location of CARISAL Site on Geology Map of Trinidad

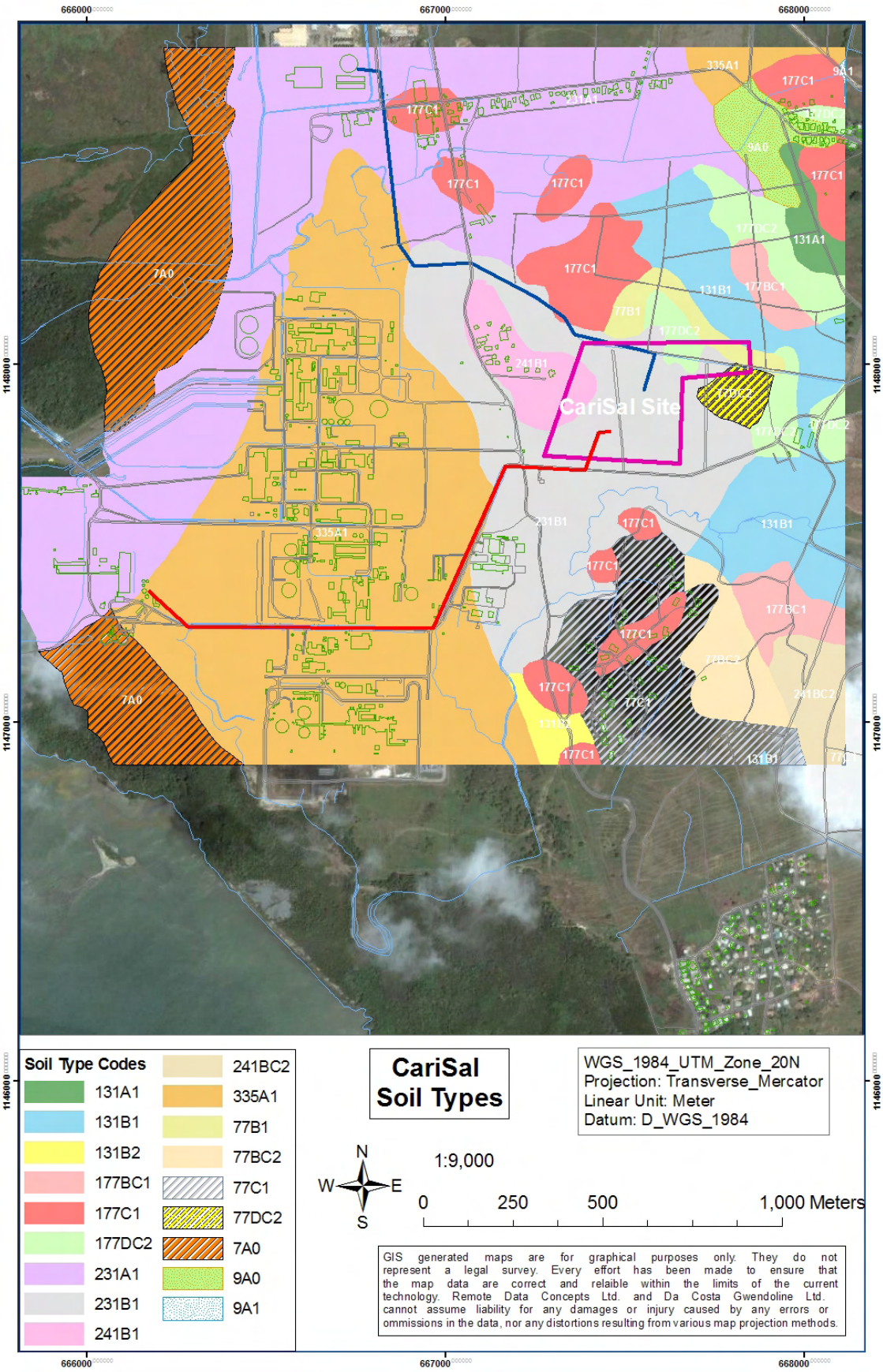


Figure 3 - Soils Map of Trinidad:-Soil Category 231B1 – Alluvium

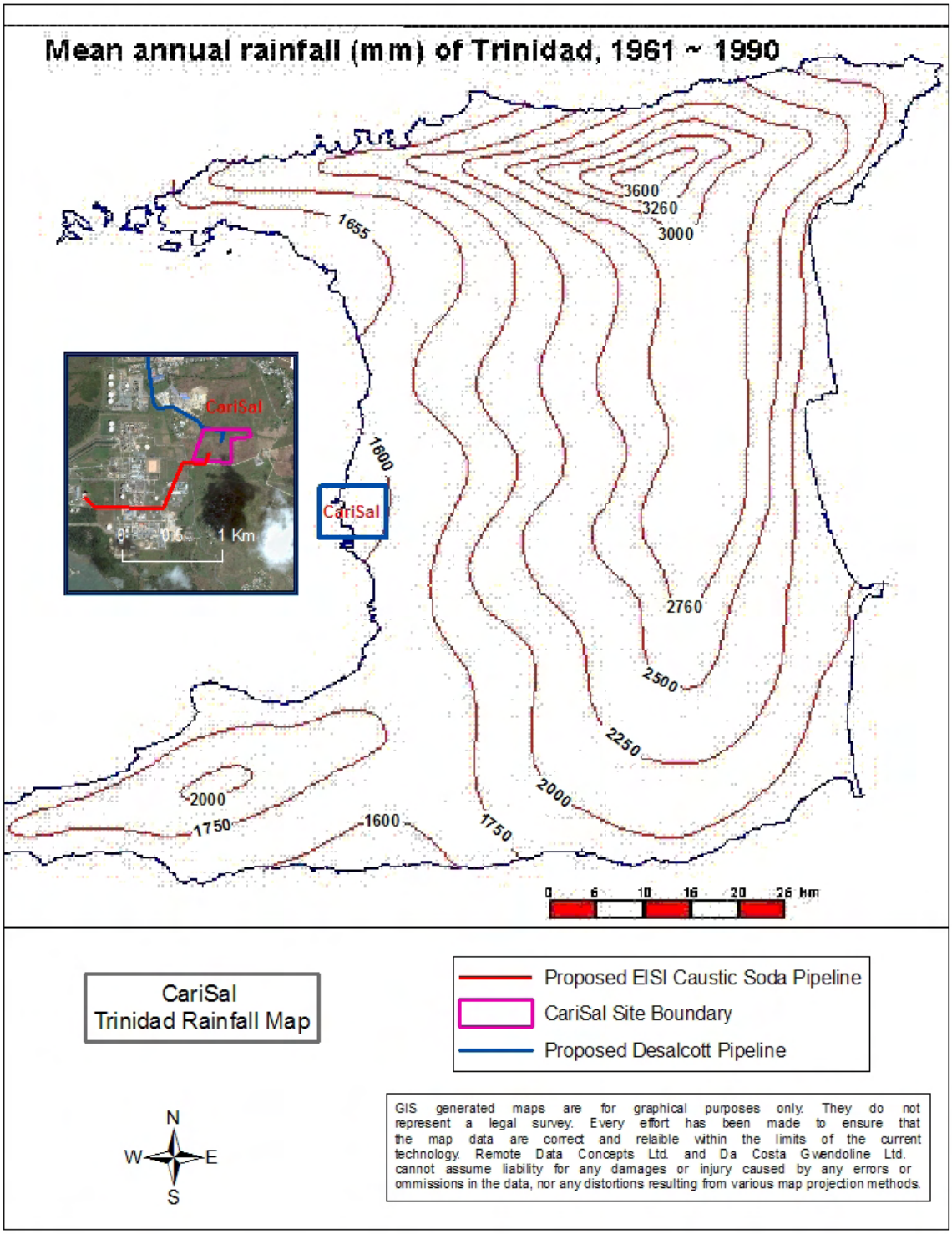


Figure 4 - Mean Annual Rainfall at CARISAL Site approx 1500 mm/yr

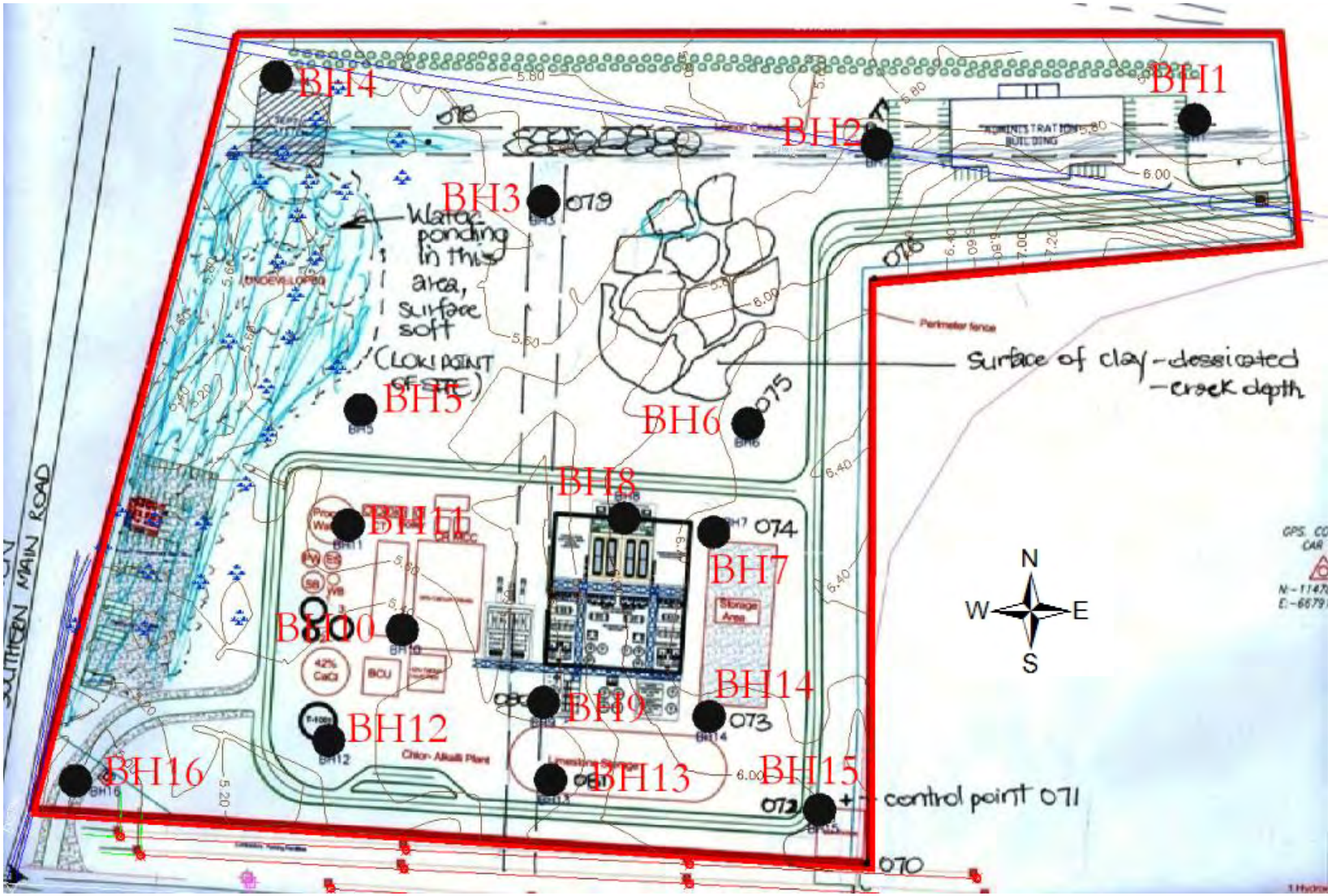


Figure 5 - Borehole and Proposed Building Layout

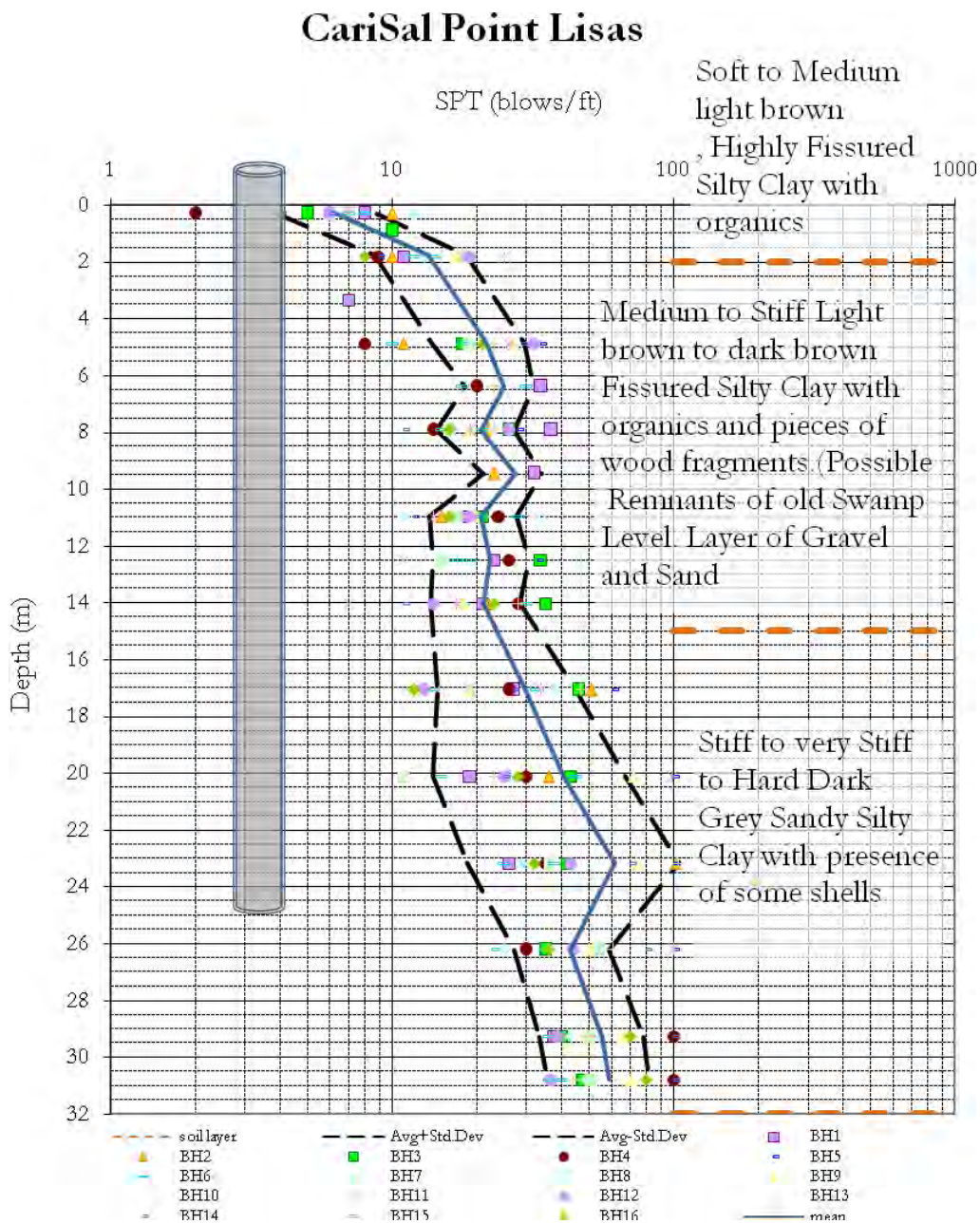


Figure 6- SPT (blows/foot) vs. Depth

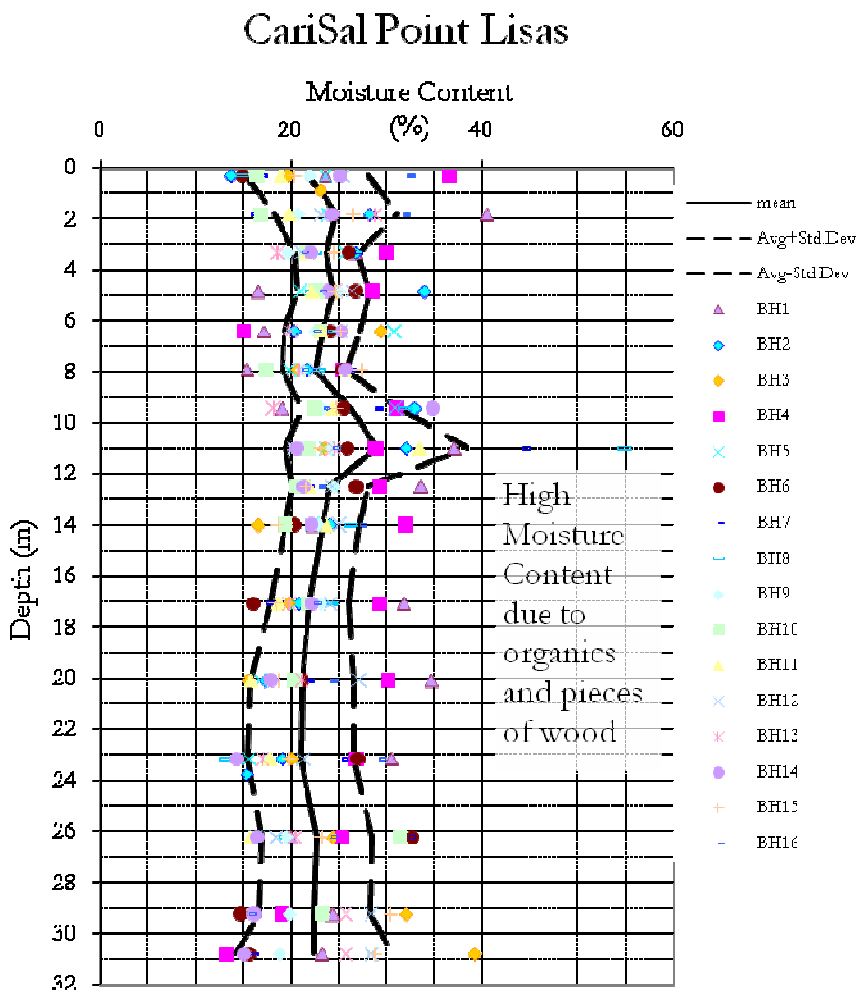


Figure 7- Moisture Content vs Depth

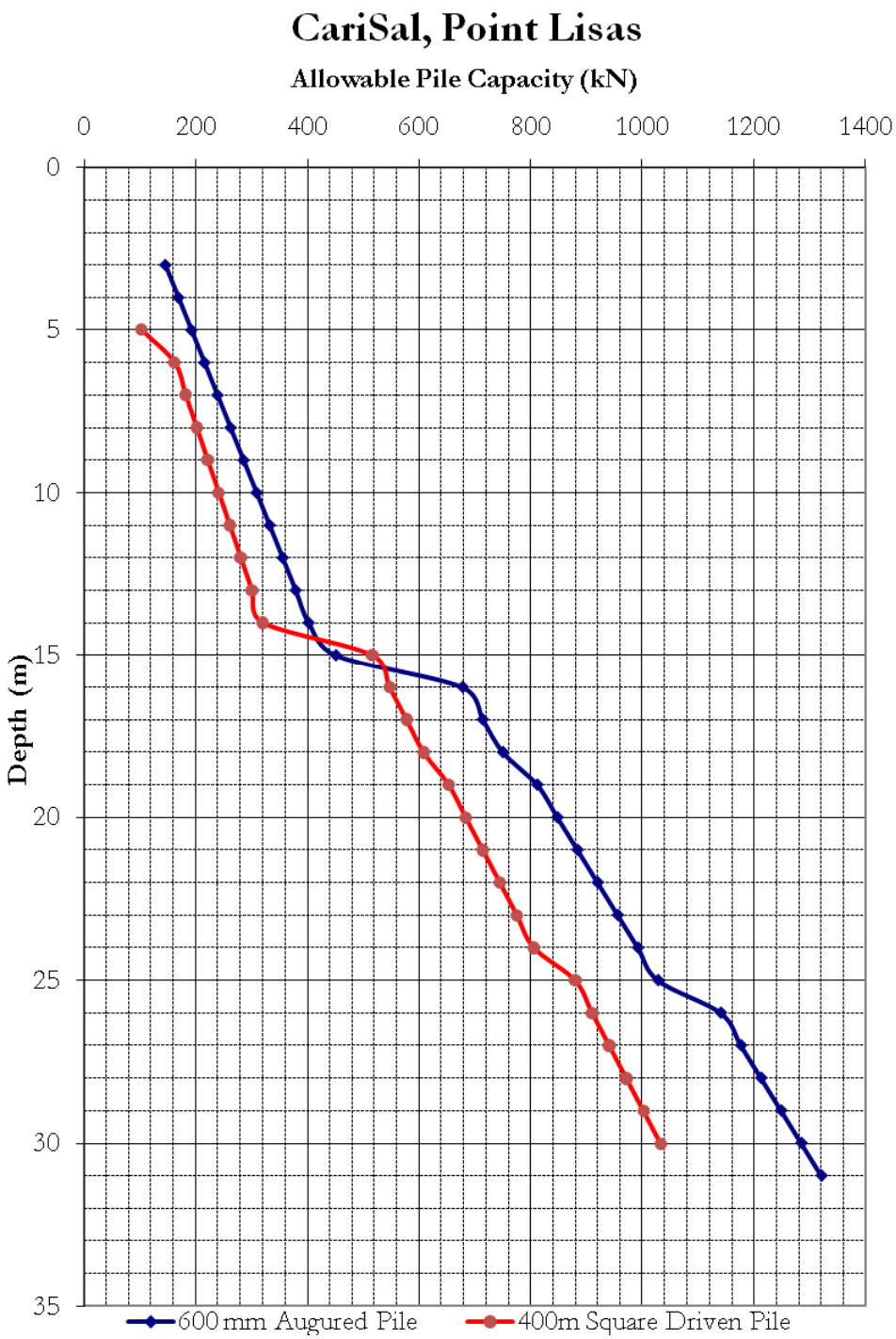


Figure 8 - Pile Capacity with Depth 400 mm Square & 600 mm diameter Augered

APPENDIX A
PHOTO CATALOGUE

BH1

APPENDIX B
BOREHOLE LOGS

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 1

Date Started: 18 May 2007
Date Completed: 18 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate):
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr): 1.22 m

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium stiff to stiff Silty CLAY with Roots, strongly cemented Silt particles and trace Organics; rust brown to dark brown and dark grey; moist.	1	8	24	
		2	11	41	
2.0	Medium stiff to very stiff Sandy Silty CLAY with strongly cemented Silt particles, trace Roots, Gypsum and possible Organics; reddish rust brown to brown and grey to dark grey.	3	7	27	1,42
4.0		4		17	13,40
6.0		5	34	17	
8.0		6	37	15	12,38
		7	32	19	
10.0		8	18	37	
12.0		9	23	34	
14.0		10	21	22	12,38
16.0		11	27	32	
18.0					
20.0		12	19	35	
22.0		13	26	30	23,59
24.0					
26.0	Hard Sandy Silty CLAY; dark grey; organic odor.	14	35	20	
28.0		15	38	24	14,49
30.0		16	49	23	

END OF BOREHOLE AT 31.10m

REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 2

Date Started: 19 May 2007
Date Completed: 19 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 2.44 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-W%-LL%	PL%-LL%
0.0	Stiff Sandy Silty CLAY with Roots; light brown to dark brown; dry.	1	10	14		
2.0	Stiff Silty CLAY with strongly cemented Silt particles, trace Roots and Organics; reddish rust brown and grey.	2	10	28		
		3		27		27,74
4.0		4	11	34		
6.0		5		20		15,31
8.0	Very stiff Silty CLAY with strongly cemented Silt particles; reddish rust brown to brown and grey; moist, slickensided.	6	22	22		
		7	23	33		
10.0		8	15	32		
12.0		9		29		17,57
14.0		10	22	24		
16.0		11	51	21		
18.0						
20.0	Hard Sandy Silty CLAY; grey; organic odor.	12	36	17		18,43
22.0	Very dense Sandy SILT with trace Clay; grey; organic odor.	13	>>102	19		
		14	>>175	15		
24.0	END OF BOREHOLE AT 24.09m					
26.0						
28.0						
30.0						

BLOW COUNT ▲ WATER (%) 1 10 100

PL W LL 0 20 40 60 80 100

REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 3

Date Started: 21 May 2007
Date Completed: 21 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 3.66 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-W%-LL%	PL%-LL%
0.0	Soft Sandy Silty CLAY with Roots; rust brown to brown and grey.	1	5	20		
		2	10	23		
2.0	Stiff to hard Silty CLAY with strongly cemented Silt particles and trace Sand; reddish rust brown to brown and grey.	3				
4.0		4	18	25		
6.0		5		29		22,59
8.0		6	26	21		
		7		23		19,66
10.0		8	21	24		19,68
12.0		9	34	21		
14.0		10	35	16		13,46
16.0		11	46	20		
18.0						
20.0		12	43	16		
22.0		13	42	20		21,60
24.0						
26.0		14	35	25		
28.0	Hard Silty CLAY with Organics and Wood fragments; dark grey to blackish grey; moist, slickensided.	15	40	32		27,51
30.0		16	48	39		

END OF BOREHOLE AT 31.10m

REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

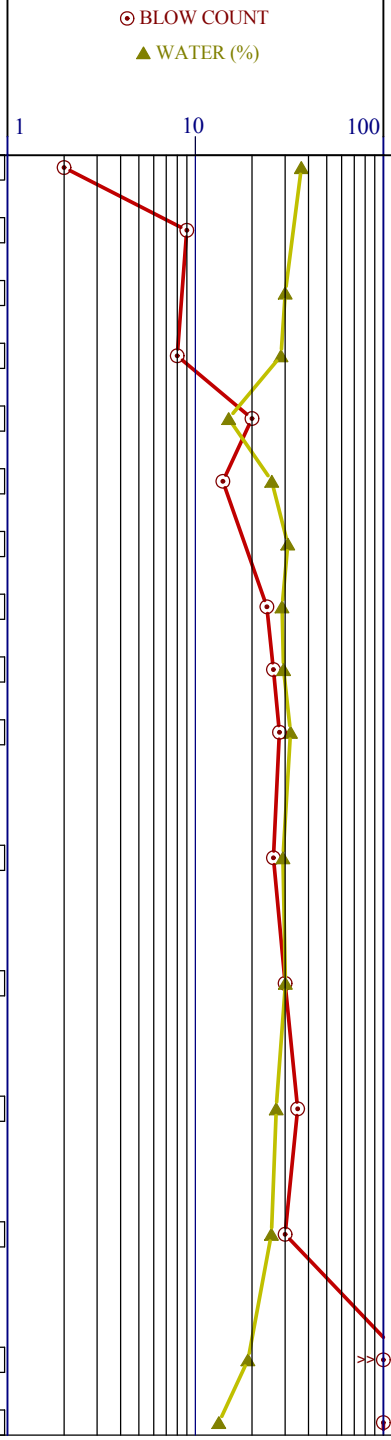
LOG OF BOREHOLE BH 4

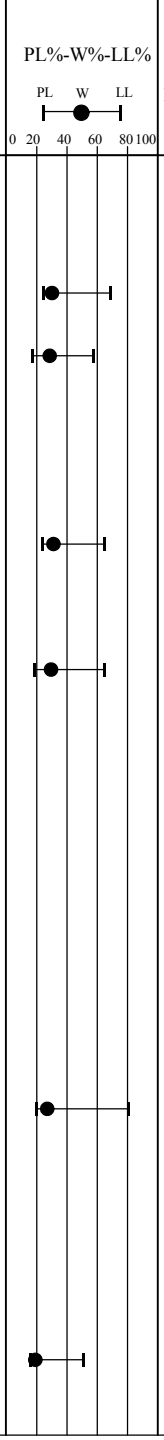
Date Started: 22 May 2007
Date Completed: 22 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate):
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Very soft Silty CLAY with Roots and Organics; rust brown to brown and grey.	1	2	37	
		2	9		
2.0		3		30	24,69
4.0	Medium stiff to hard Silty CLAY with strongly cemented Silt particles and trace Sand; reddish rust brown to brown and grey to dark grey; slickensided.	4	8	29	17,57
6.0		5	20	15	
		6	14	26	
8.0		7		31	24,65
10.0		8	24	29	
12.0		9	26	29	18,65
14.0		10	28	32	
16.0		11	26	29	
18.0					
20.0		12	30	30	
22.0		13	35	27	20,81
24.0					
26.0		14	30	25	
28.0	Very dense Sandy Clayey SILT with Shell fragments and trace Gravel particles; grey to dark grey.	15	>>130	19	16,51
30.0		16		13	
	END OF BOREHOLE AT 31.10m				





REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

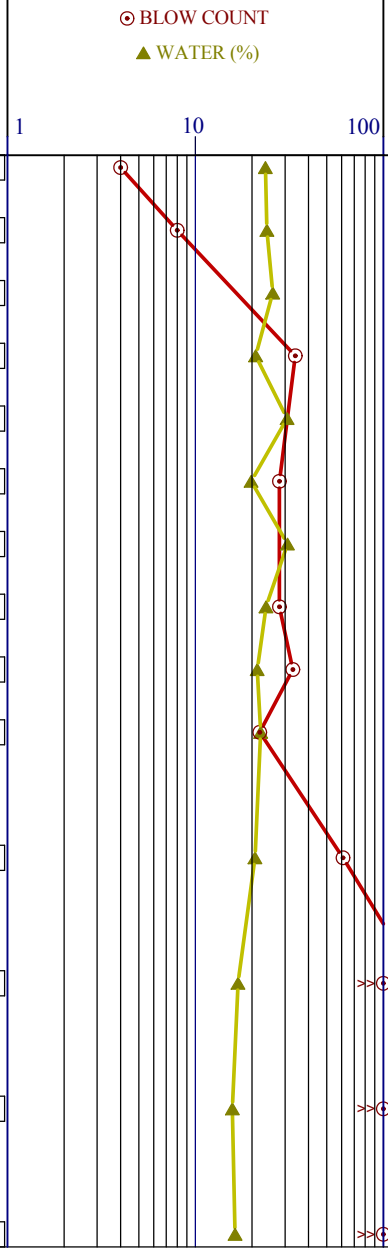
LOG OF BOREHOLE BH 5

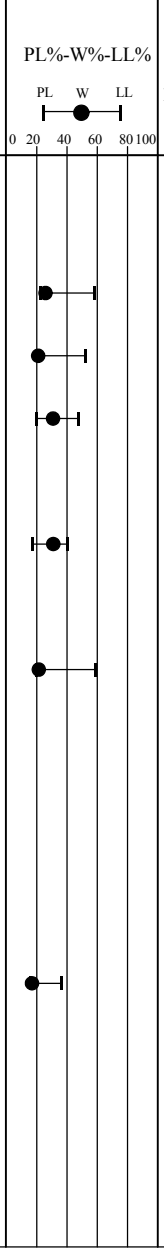
Date Started: 30 May 2007
Date Completed: 30 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 0.91 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr): 0.61 m

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-W%-LL%	PL%-LL%
0.0	Soft to hard Silty CLAY with Roots, strongly cemented Silt particles, Sand and possible Organics; rust brown to dark brown and grey to dark grey.	1	4	24		
		2	8	24		
2.0		3		26		22,58
4.0		4	34	21		21,52
6.0		5		31		20,48
8.0	Dense Sandy SILT with trace Gravel and Clay; dark brown and dark grey; organic odor.	6	28	20		
		7		31		17,40
10.0	Very stiff Sandy Silty CLAY with trace strongly cemented Silt particles; rust brown to brown and dark grey.	8	28	24		
12.0		9	33	21		20,59
14.0		10	22	22		
16.0	Hard Silty CLAY with Gypsum and strongly cemented Silt particles; reddish rust brown and grey.	11	61	21		
18.0						
20.0	Hard Sandy Silty CLAY with trace strongly cemented Silt particles; reddish rust brown and grey.	12	>>156	17		16,36
22.0	Very dense Sandy SILT with trace Clay; light brown to brown and grey.	13	>>127	16		
24.0						
26.0	Hard Sandy Silty CLAY with layers of Silt particles; rust brown to brown and grey.	14	>>175	16		
	END OF BOREHOLE AT 26.52m					
28.0						
30.0						





REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 6

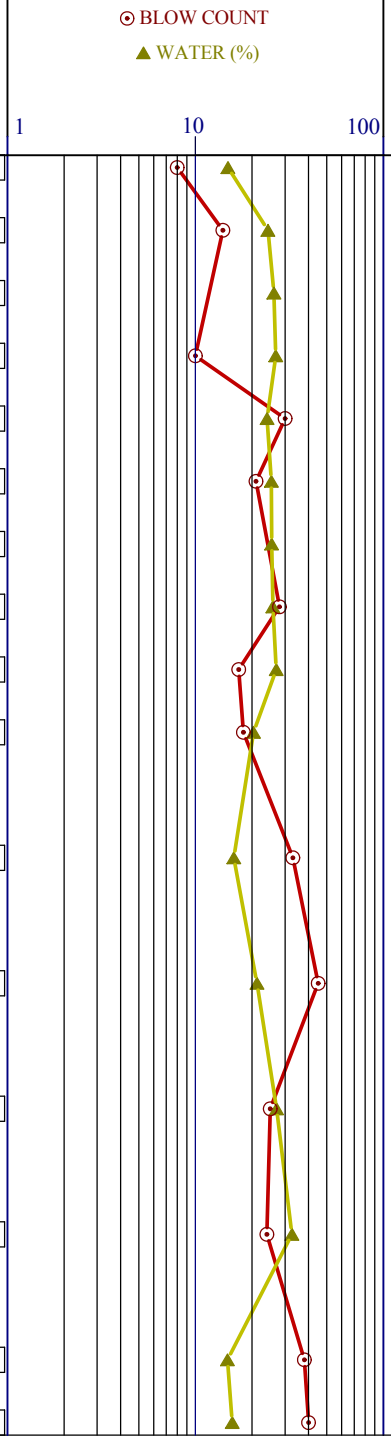
Date Started: 23 May 2007
Date Completed: 23 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 4.57 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

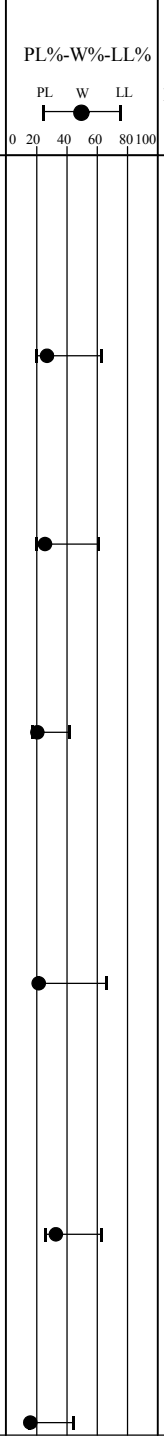
Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium stiff to very stiff Silty CLAY with Roots, trace strongly cemented Silt particles, Gypsum, Sand and Organics; rust brown to dark brown and grey to dark grey.	1	8	15	
2.0		2	14	24	
		3		26	
4.0		4	10	27	20,63
6.0		5	30	24	
		6	21	25	
8.0		7		25	20,61
10.0		8	28	26	
12.0		9	17	27	
14.0		10	18	20	17,41
16.0	Very dense Sandy Clayey SILT with trace Gypsum and strongly cemented Silt particles; dark reddish rust brown and grey.	11	33	16	
18.0					
20.0	Very stiff to hard Silty CLAY with trace strongly cemented Silt particles; reddish rust brown and light grey to grey; slickensided.	12	45	21	21,66
22.0		13	25	27	
24.0					
26.0	Very stiff Silty CLAY with Shells; fissured; dark grey; slickensided.	14	24	33	26,63
28.0	Hard Sandy Silty CLAY with trace strongly cemented Silt particles; dark grey.	15	38	15	
30.0		16	40	16	15,44

END OF BOREHOLE AT 31.10m





REMARKS:
Failed attempt to recover Shelby tube 10'-12', A split spoon was taken but no blow counts were recorded
Shelby tube not retaining sample at 25'-27', Split spoon was taken

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 7

Date Started: 28 May 2007
Date Completed: 28 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate):
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-W%-LL%	PL%-LL%
0.0	Stiff Silty CLAY with Roots, strongly cemented Silt particles and trace Sand; rust brown to dark brown and grey to dark grey.	1	12	17		
		2	13	16		
2.0	Medium stiff Silty CLAY with trace strongly cemented Silt particles and Roots; rust brown and grey.	3		27		18,49
4.0		4	22	24		
6.0		5		23		19,57
8.0		6	23	26		
		7		29		17,28
10.0	Stiff Sandy SILT with Organics, Wood fragments and trace Clay; dark grey.	8	11	44		
12.0		9		22		
14.0	Very stiff to hard Silty CLAY with Gypsum, strongly cemented Silt particles and trace Sand; rust brown to brown and light grey to grey; slickensided.	10	23	26		21,56
16.0		11	38	18		
18.0						
20.0		12	27	22		
22.0		13	29	25		24,82
24.0						
26.0	Very stiff Silty CLAY with Shells; dark grey; slickensided.	14	25	32		
28.0						
	Hard Sandy Silty CLAY with strongly cemented Silt particles; reddish rust brown and grey.	15	43	19		17,46
30.0		16	49	16		
	END OF BOREHOLE AT 31.10m					

Blow count scale: 1 – 10 – 100

REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 8

Date Started: 29 May 2007
Date Completed: 29 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 3.66 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-W%-LL%	PL%-LL%
0.0	Medium stiff to very stiff Silty CLAY with strongly cemented Silt particles, Roots and Sand; rust brown to dark brown and grey to dark grey.	1	7	15		
2.0		2	18	20		
		3		22		19,51
4.0		4	19	22		
6.0		5		25		18,45
8.0		6	16	23		15,38
		7		32		
10.0	Medium dense to dense Sandy SILT with Organics, Wood fragments, trace Gravel particles and Clay; dark brown and dark grey.	8	17	55		
12.0		9	15	21		
14.0		10		26		
16.0		11	11	24		15,32
18.0						
20.0	Hard Silty CLAY with Strongly cemented Silt particles, Gypsum and trace Sand; reddish rust brown and grey.	12	37	18		18,44
22.0		13	54	13		
24.0						
26.0		14	50	19		16,62
28.0		15	51			
30.0		16	53			

END OF BOREHOLE AT 31.10m

REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH 9

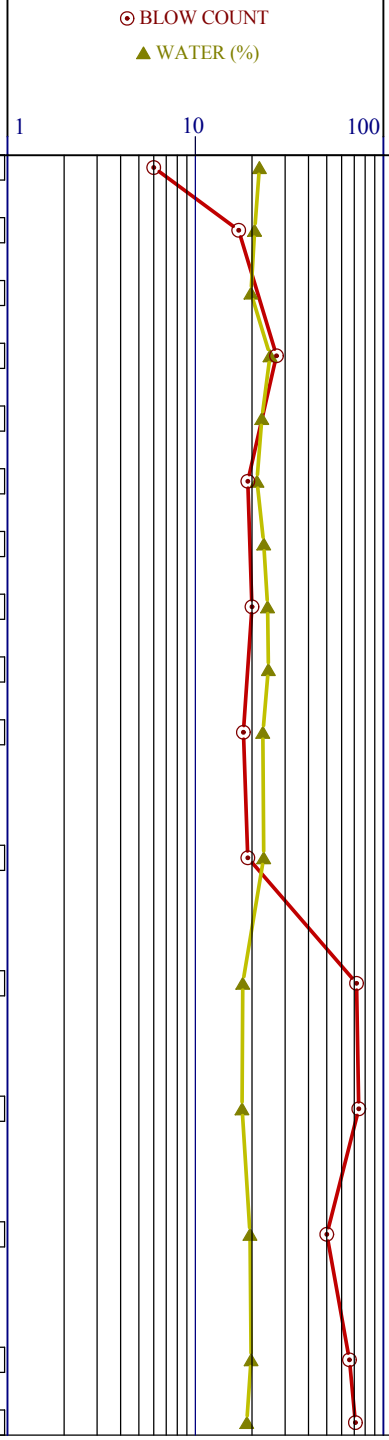
Date Started: 9 June 2007
Date Completed: 9 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 3.66 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

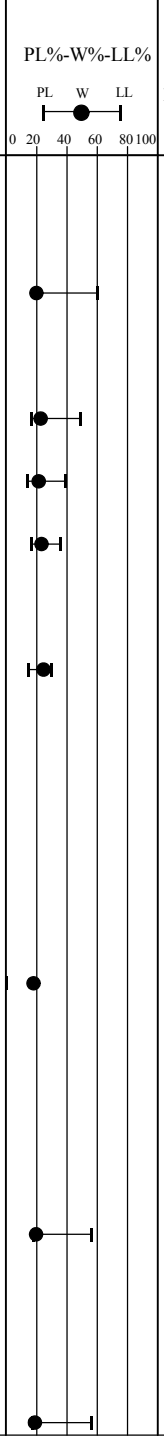
Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium to very stiff Silty CLAY with Roots and trace Organics; rust brown to dark brown and grey to dark grey.	1	6	22	
2.0		2	17	21	
		3		20	20,60
4.0		4	27	25	
6.0		5		23	17,49
8.0	Dense Sandy Clayey SILT with trace strongly cemented Silt particles; rust brown and grey.	6	19	21	14,39
		7		23	17,35
10.0	Very stiff Sandy Silty CLAY with trace strongly cemented Silt particles; rust brown to brown and grey.	8	20	24	
12.0		9		24	14,30
14.0		10	18	23	
16.0	Medium dense Sandy Clayey SILT with trace strongly cemented Silt particles, Gravel sized particles; dark brown and dark grey; organic odor.	11	19	23	
18.0					
20.0		12	72	18	0,0
22.0	Hard Silty CLAY with strongly cemented Silt particles, trace Gypsum and white Marl; light grey to grey and reddish rust brown.	13	74	18	
24.0					
26.0		14	50	20	18,56
28.0		15	66	20	
30.0		16	71	19	17,56

END OF BOREHOLE AT 31.10m





REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

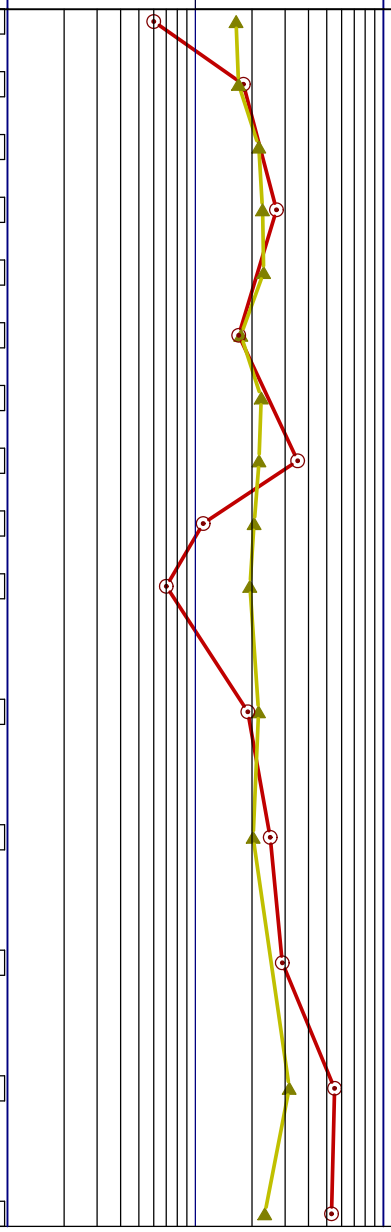
LOG OF BOREHOLE BH10

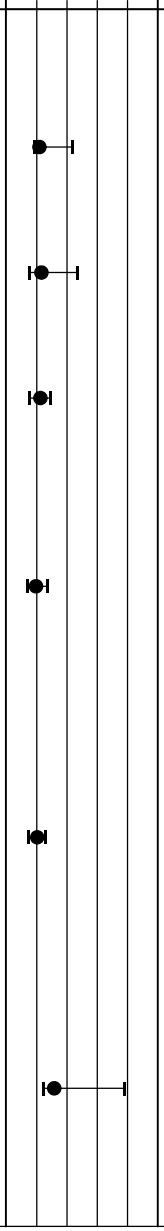
Date Started: 1 June 2007
Date Completed: 1 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 3.66 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr): 2.13 m

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium stiff to very stiff Silty CLAY with strongly cemented Silt particles, trace Roots and Gypsum; mottled; rust brown to dark brown and grey.	1	6	16	
2.0		2	18	17	
		3		22	19,44
4.0		4	27	23	
6.0		5		23	15,47
8.0		6	17	17	
		7		22	15,29
10.0	Medium dense to very dense Sandy SILT with Clay, trace Gravel sized particles, Organics and Wood fragments; grey to dark grey and dark brown to brown.	8	35	22	
12.0		9	11	21	
14.0		10	7	19	14,27
16.0		11	19	22	
18.0					
20.0		12	25	20	14,26
22.0		13	29		
24.0					
26.0	Hard Silty CLAY with trace Gypsum and strongly cemented Silt particles; rust brown and grey; slickensided.	14	55	32	25,78
28.0		15	53	23	
30.0	END OF BOREHOLE AT 29.57m				





REMARKS:
Shaft Broke at 97'

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

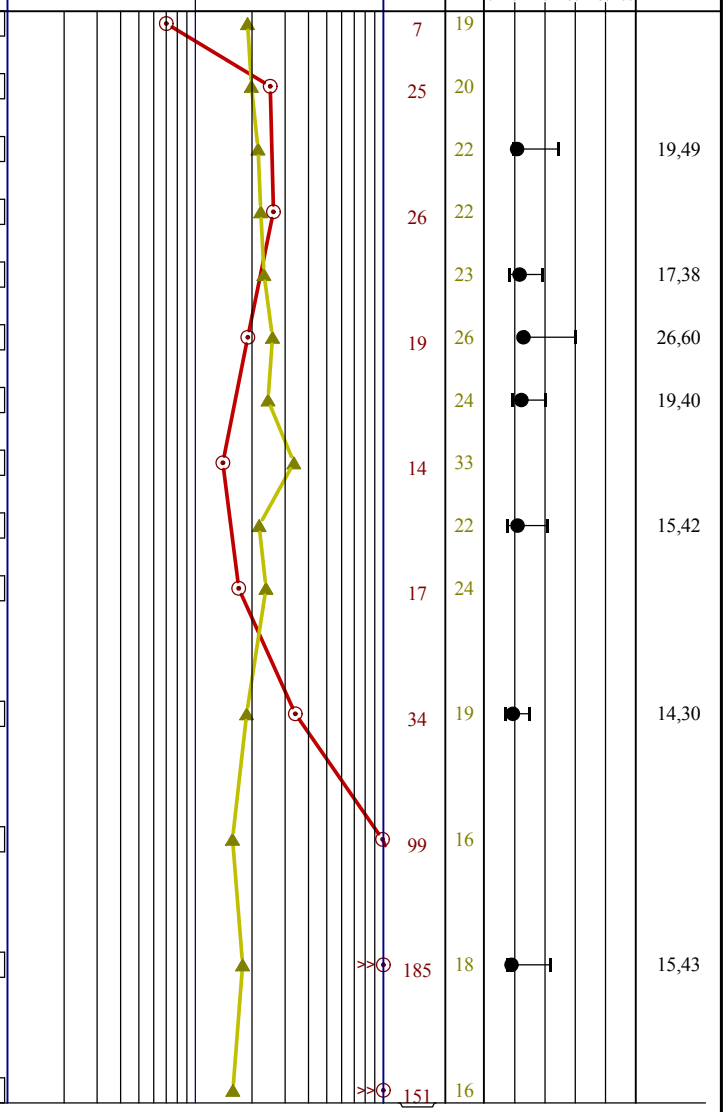
LOG OF BOREHOLE BH11

Date Started: 8 June 2007
Date Completed: 8 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 2.44 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium to very stiff Silty CLAY with strongly cemented Silt particles with trace Organics; rust brown to dark brown and grey.	1	7	19	
2.0		2	25	20	
		3		22	19,49
4.0		4	26	22	
6.0		5		23	17,38
8.0		6	19	26	26,60
		7		24	19,40
10.0	Medium dense Sandy Clayey SILT with Organics and small Wooden fragments; dark grey.	8	14	33	
12.0		9		22	15,42
14.0	Very stiff Sandy Silty CLAY with trace strongly cemented Silt particles; rust brown to brown and dark grey.	10	17	24	
16.0	Very dense Sandy Clayey SILT with trace strongly cemented Silt particles; light brown to brown.	11	34	19	14,30
18.0					
20.0		12	99	16	
22.0	Hard Sandy Silty CLAY with strongly cemented Silt particles; reddish rust brown and grey.	13	>>185	18	15,43
24.0					
26.0	Hard Silty CLAY with trace strongly cemented Silt particles; rust brown and grey.	14	>>151	16	
28.0	END OF BOREHOLE AT 26.52m				
30.0					



REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

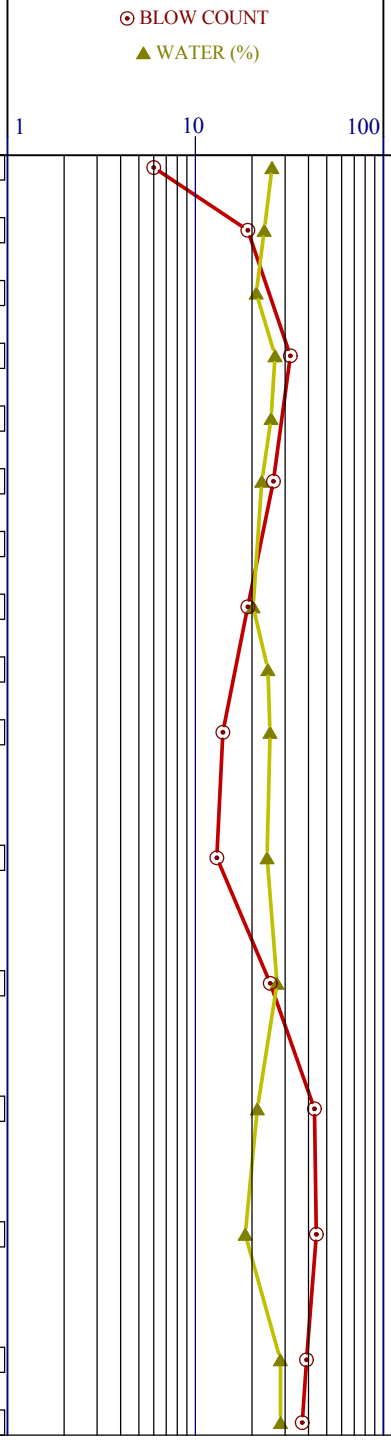
LOG OF BOREHOLE BH12

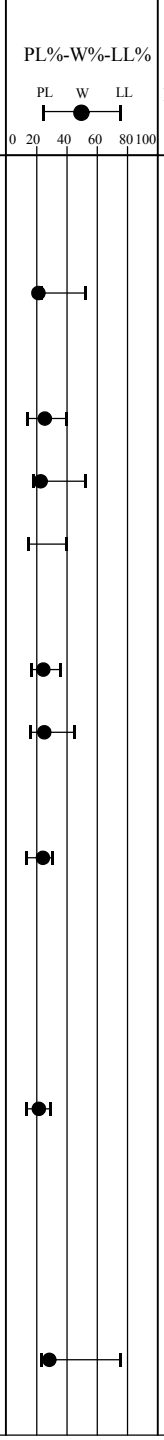
Date Started: 5 June 2007
Date Completed: 5 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 3.66 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium stiff to hard Silty CLAY with Roots, strongly cemented Silt particles and possible Organics; rust brown to brown and grey.	1	6	26	
2.0		2	19	23	
		3		21	23,52
4.0		5	32	27	
6.0		6		25	14,40
8.0		7	26	23	18,52
		8			14,39
10.0	Dense Sandy SILT with Organics, trace strongly cemented Silt particles and Clay; rust brown to dark brown and dark grey.	9	19	20	
12.0		10		24	16,36
14.0	Stiff to very stiff Sandy Silty CLAY with strongly cemented Silt particles and trace Organics; rust brown to dark brown and dark grey.	11	14	25	16,45
16.0		12	13	24	13,30
18.0					
20.0		13	25	27	
22.0	Very dense Sandy SILT with trace Clay; rust brown to brown and grey; moist.	14	43	21	13,29
24.0					
26.0	Hard Silty CLAY with trace strongly cemented Silt particles and Sand; light brown to rust brown and grey.	15	44	18	
28.0		16	39	28	23,75
30.0		17	37	28	
	END OF BOREHOLE AT 31.10m				





REMARKS:
Loss of water at 10'

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

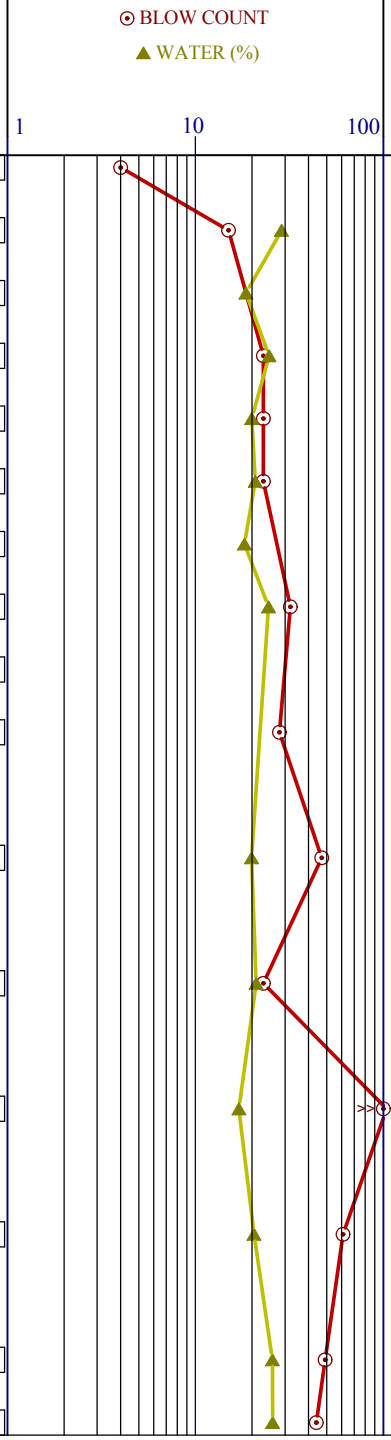
LOG OF BOREHOLE BH13

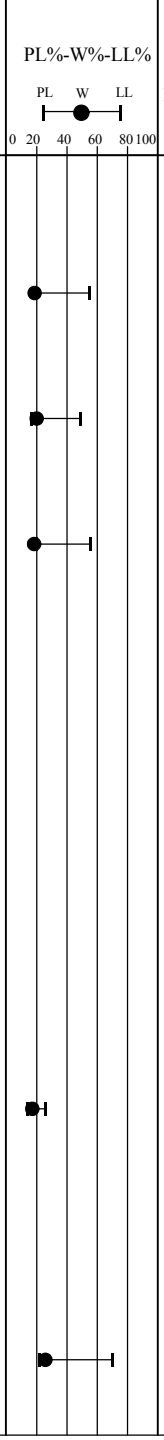
Date Started: 11 June 2007
Date Completed: 11 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 4.57 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Stiff to very stiff Silty CLAY with trace Roots, Gypsum and Sand; rust brown to dark brown and grey to dark grey.	1	4		
2.0		2	15	29	
		3		19	19,55
4.0		4	23	25	
6.0		5	23	20	16,49
		6	23	21	
8.0		7		18	20,55
10.0		8	32	25	
12.0		9			
14.0		10	28		
16.0	Very dense Silty SAND and GRAVEL; dark brown; moist.	11	47	20	
18.0					
20.0	Dense Sandy SILT; brown and grey; moist.	12	23	21	
22.0	Very dense Sandy SILT with trace Clay; rust brown to brown and grey.	13	>>104	17	14,26
24.0					
26.0	Hard Silty CLAY with strongly cemented Silt particles, trace Gypsum and Sand; reddish rust brown and grey.	14	61	21	
28.0		15	49	26	22,70
30.0		16	44	26	
	END OF BOREHOLE AT 31.10m				





REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH14

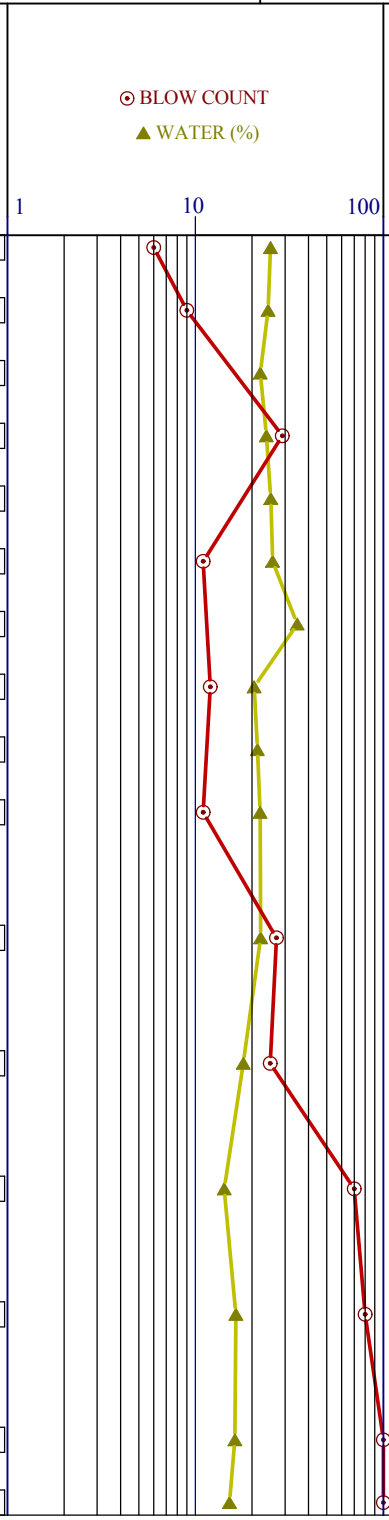
Date Started: 10 June 2007
Date Completed: 10 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 3.66 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

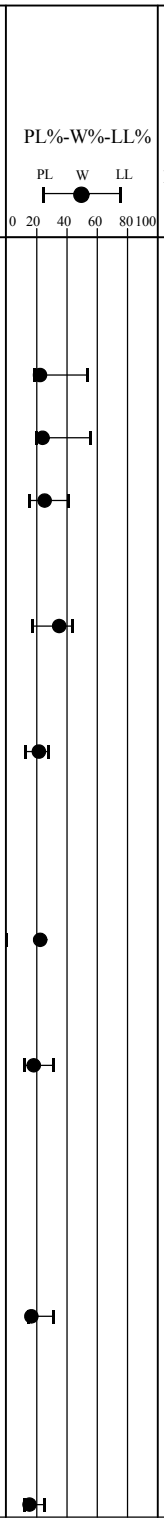
Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-W%-LL%	PL%-LL%
0.0	Medium to very stiff Silty CLAY with fine Roots, trace strongly cemented Silt particles, Sand and Gypsum; rust brown to dark brown and grey to dark grey.	1	6	25		
2.0		2	9	24		
		3		22		18,53
4.0		4	29	24		20,55
6.0		5		25		15,41
8.0	Stiff Sandy Silty CLAY with trace strongly cemented Silt particles; rust brown to brown and grey.	6	11	26		
		7		35		17,43
10.0	Medium dense Sandy Clayey SILT with trace strongly cemented Silt particles; rust brown to brown and dark grey.	8	12	21		
12.0		9		21		13,28
14.0	Medium dense to dense Sandy SILT with trace Clay and strongly cemented Silt particles; rust brown to brown and grey to dark grey.	10	11	22		
16.0		11	27	22		0,0
18.0						
20.0		12	25	18		11,31
22.0	Hard Sandy Silty CLAY; brown to light brown and grey.	13	70	14		
24.0						
26.0	Very dense Sandy Clayey SILT with trace strongly cemented Silt particles; light rust brown and grey.	14	80	16		15,31
28.0		15		16		
30.0		16		15		12,25

END OF BOREHOLE AT 31.10m





REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH15

Date Started: 17 May 2007
Date Completed: 17 May 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 2.13 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr): 2.44 m

Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Medium stiff Silty CLAY with Roots and trace Organics; rust brown to dark brown and dark grey.	1	7	20	
		2	12	27	
2.0	Stiff to very stiff Silty CLAY with strongly cemented Silt particles, trace Sand, Roots, Organics and Gypsum; rust brown to brown and grey.	3		24	21,58
4.0		4	18	25	
6.0		5	18	25	
8.0		6	15	27	
		7		25	22,57
10.0		8	21	23	
12.0		9	19	22	
14.0		10	30	19	
16.0	Medium dense Sandy Clayey SILT with strongly cemented Silt particles; rust brown to brown and grey.	11	14	18	12,32
18.0					
20.0		12	15	19	13,31
22.0		13	38	20	
24.0					
26.0	Hard Silty CLAY with layers of brown Silt particles and trace Sand; fissured; rust brown to brown and grey; slickensided.	14	35	23	21,59
28.0		15	36	30	
30.0		16	36	29	

END OF BOREHOLE AT 31.10m

REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

EISL 0151/1-07

CARISAL - Calcium Carbide Plant

Point Lisas

SITE INVESTIGATION

LOG OF BOREHOLE BH16

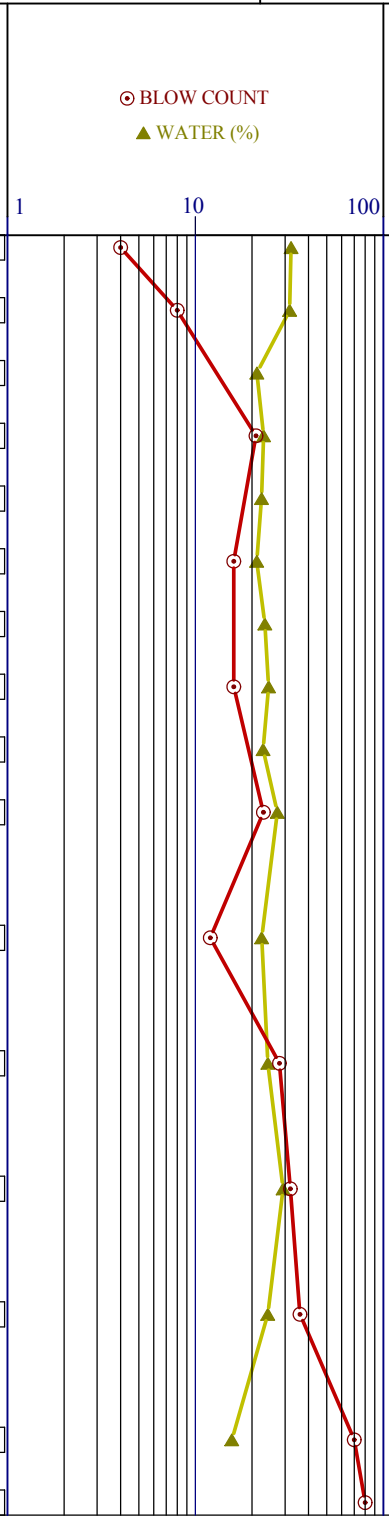
Date Started: 6 June 2007
Date Completed: 6 June 2007
Drilling Method: Wash Boring
Sampling Method: Split Spoon
WATER LEVEL INFORMATION
WL (Immediate): 1.83 m
WL (With Casing):
WL (Casing Removed):
WL (After Boring):
WL (24 hr):

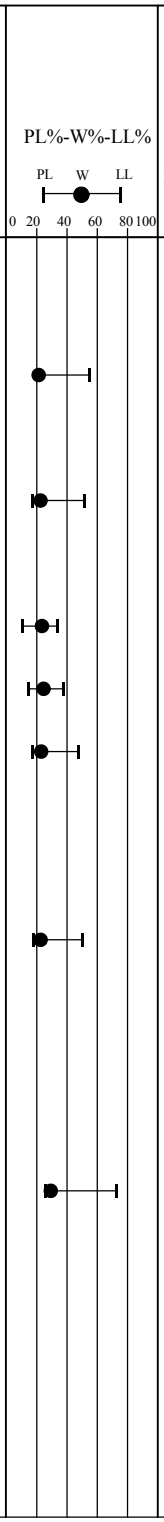
Sample Condition: Shelby Tube, Split Spoon, Augured, Wash Out, Rock Core, Sample Lost

Water Levels: Immediate Water Level, After Completion, 24hr Water Level

ELEV. (m) / DEPTH (m)	DESCRIPTION	SAMPLE NUMBER	BLOW COUNT	WATER (%)	PL%-LL%
0.0	Soft to very stiff Silty CLAY with Roots, Twigs, trace Organics, strongly cemented Silt particles and Gypsum; rust brown to dark brown and grey to dark grey.	1	4	32	
		2	8	32	
2.0		3		21	20,55
4.0		4	21	23	
6.0		5		22	17,52
8.0	Stiff to very stiff Sandy Silty CLAY with trace strongly cemented Silt particles and Gypsum; rust brown to dark brown and grey to dark grey.	6	16	21	
		7		23	11,34
10.0		8	16	25	15,38
12.0		9		23	17,48
14.0		10	23	27	
16.0		11	12	23	18,50
18.0					
20.0	Dense Sandy Clayey SILT with strongly cemented Silt particles; dark grey.	12	28	24	
22.0	Hard Silty CLAY with layers of strongly cemented Silt; yellowish rust brown and reddish rust brown and grey; fissured.	13	32	29	26,73
24.0					
26.0		14	36	24	
28.0	Hard Sandy Silty CLAY with trace Gypsum; rust brown and grey.	15	70	16	
30.0		16	80		

END OF BOREHOLE AT 31.10m

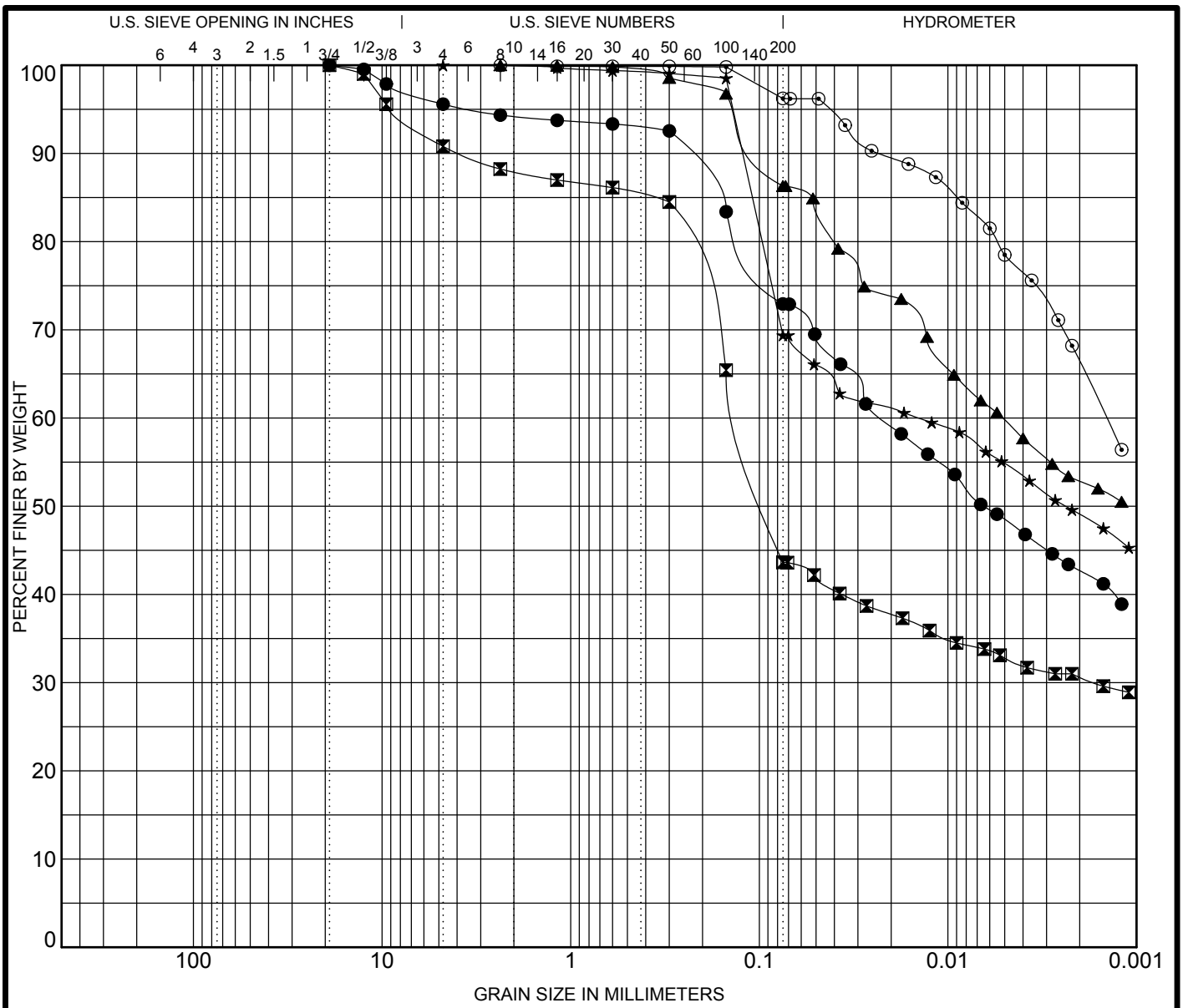




REMARKS:

LOG OF BOREHOLE 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

APPENDIX C
LABORATORY TEST RESULTS



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 1/SA 3	3.35m	LEAN CLAY with SAND(CI)	42	1	41		
⊠	BH 1/SA 4	4.88m	CLAYEY SAND(SC)	40	13	27		
▲	BH 1/SA 6	7.92m	LEAN CLAY(CI)	38	12	26		
★	BH 1/SA 10	14.02m	SANDY LEAN CLAY(CI)	38	12	26		
⊙	BH 1/SA 13	23.16m	FAT CLAY(CH)	59	23	36		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 1/SA 3	3.35m	19	0.022			4.4	22.7	30.3	42.7
⊠	BH 1/SA 4	4.88m	19	0.126	0.002		9.2	47.2	13.0	30.7
▲	BH 1/SA 6	7.92m	2.36	0.005			0.0	13.7	33.4	52.9
★	BH 1/SA 10	14.02m	4.75	0.014			0.0	30.6	20.3	49.1
⊙	BH 1/SA 13	23.16m	2.36	0.001			0.0	3.8	29.9	66.3

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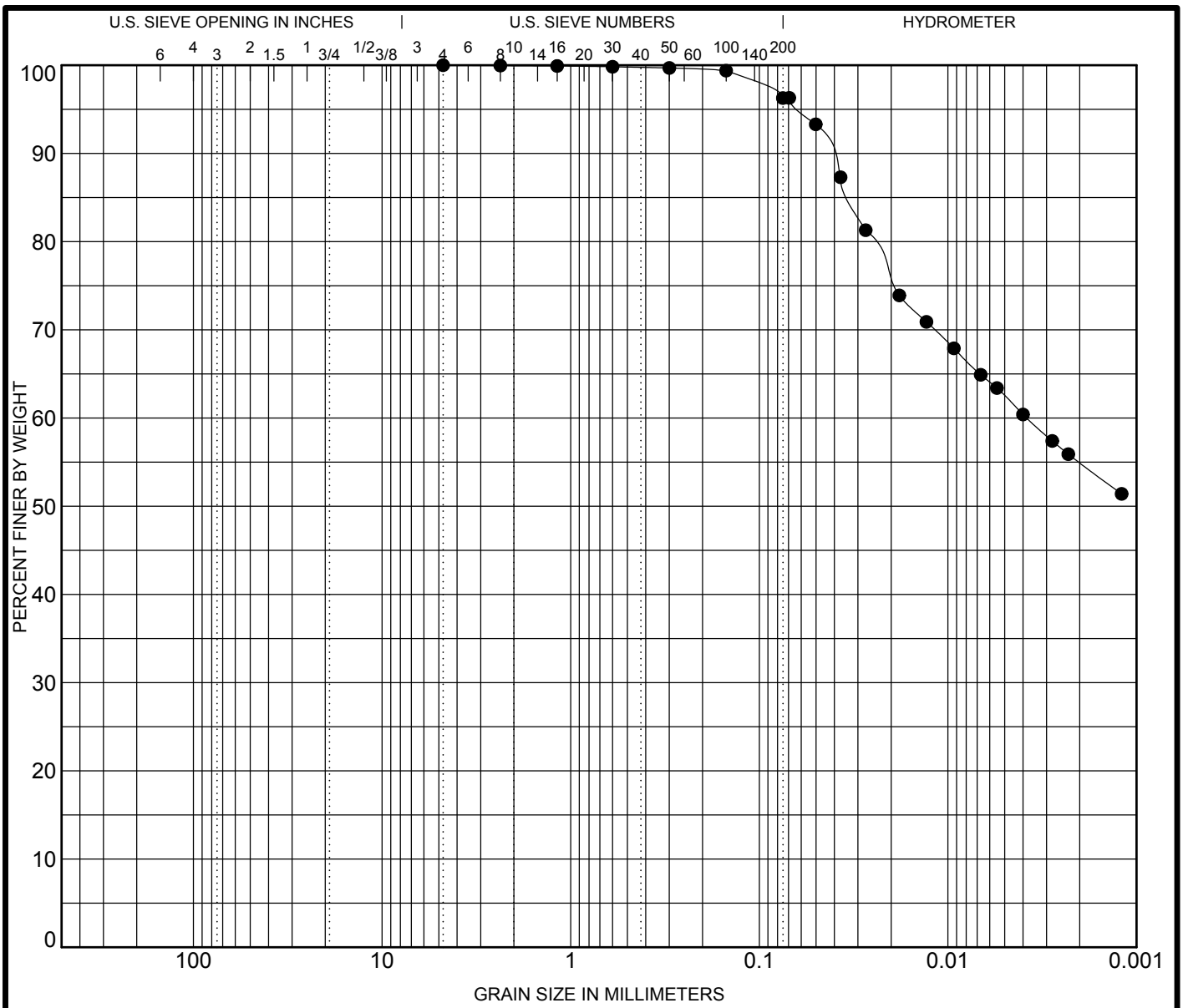
GRAIN SIZE DISTRIBUTION

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

EISL SIEVE 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 1/SA 15 29.26m**	**LEAN CLAY(CI)**	**49**	**14**	**35**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 1/SA 15 29.26m**	**4.75**	**0.004**			**0.0**	**3.7**	**41.3**	**54.9**

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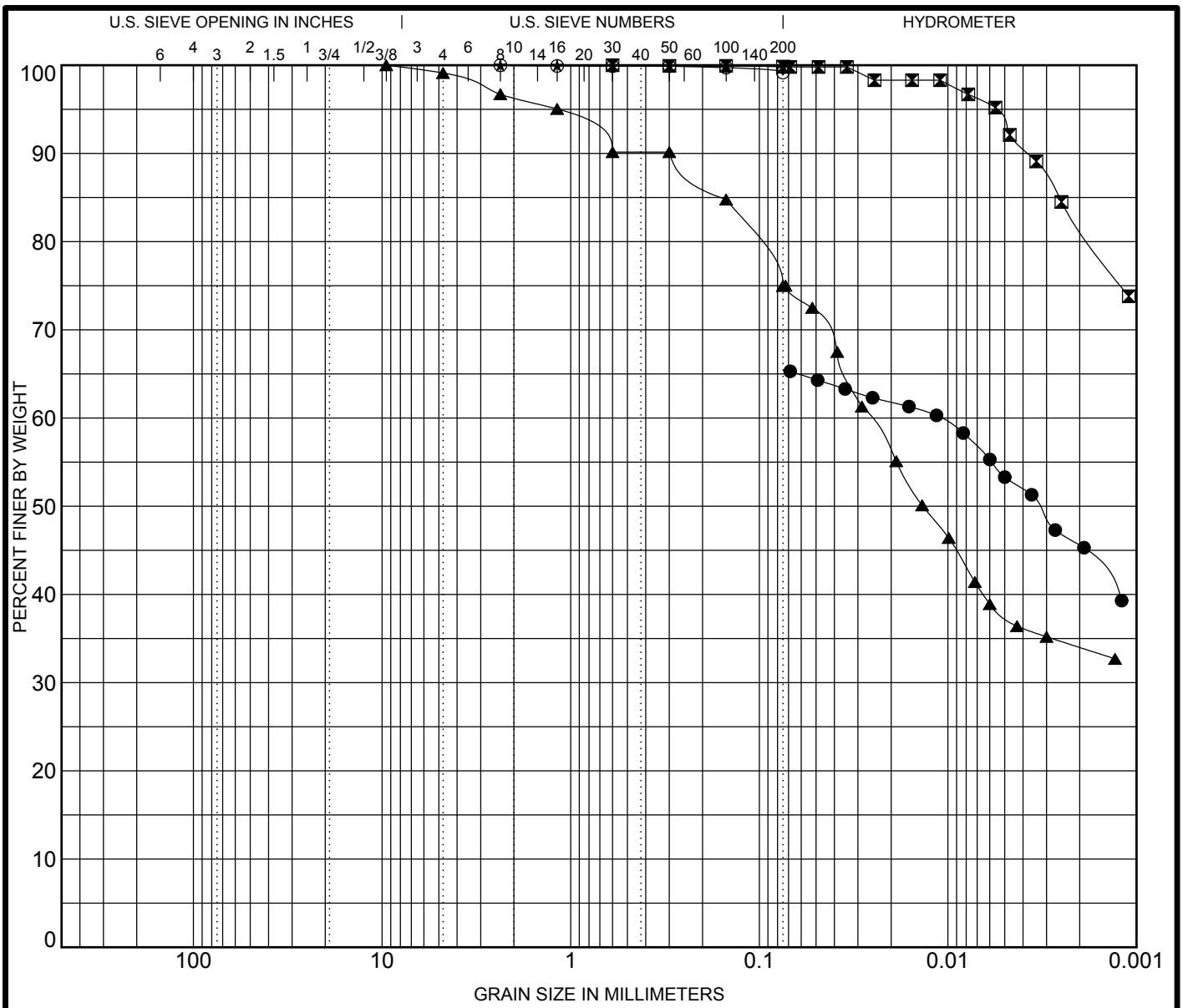

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 2/SA 2	1.83m						
⊠	BH 2/SA 3	3.35m	FAT CLAY(CH)	74	27	47		
▲	BH 2/SA 5	6.40m	LEAN CLAY with SAND(CI)	31	15	16		
★	BH 2/SA 7	9.45m						
⊙	BH 2/SA 9	12.50m	FAT CLAY(CH)	57	17	40		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 2/SA 2	1.83m		0.011						45.6
⊠	BH 2/SA 3	3.35m	0.6				0.0	0.2	18.3	81.6
▲	BH 2/SA 5	6.40m	9.5	0.026			0.9	24.1	41.0	34.0
★	BH 2/SA 7	9.45m	2.36				0.0	0.2	99.8	
⊙	BH 2/SA 9	12.50m	2.36				0.0	0.8	99.2	

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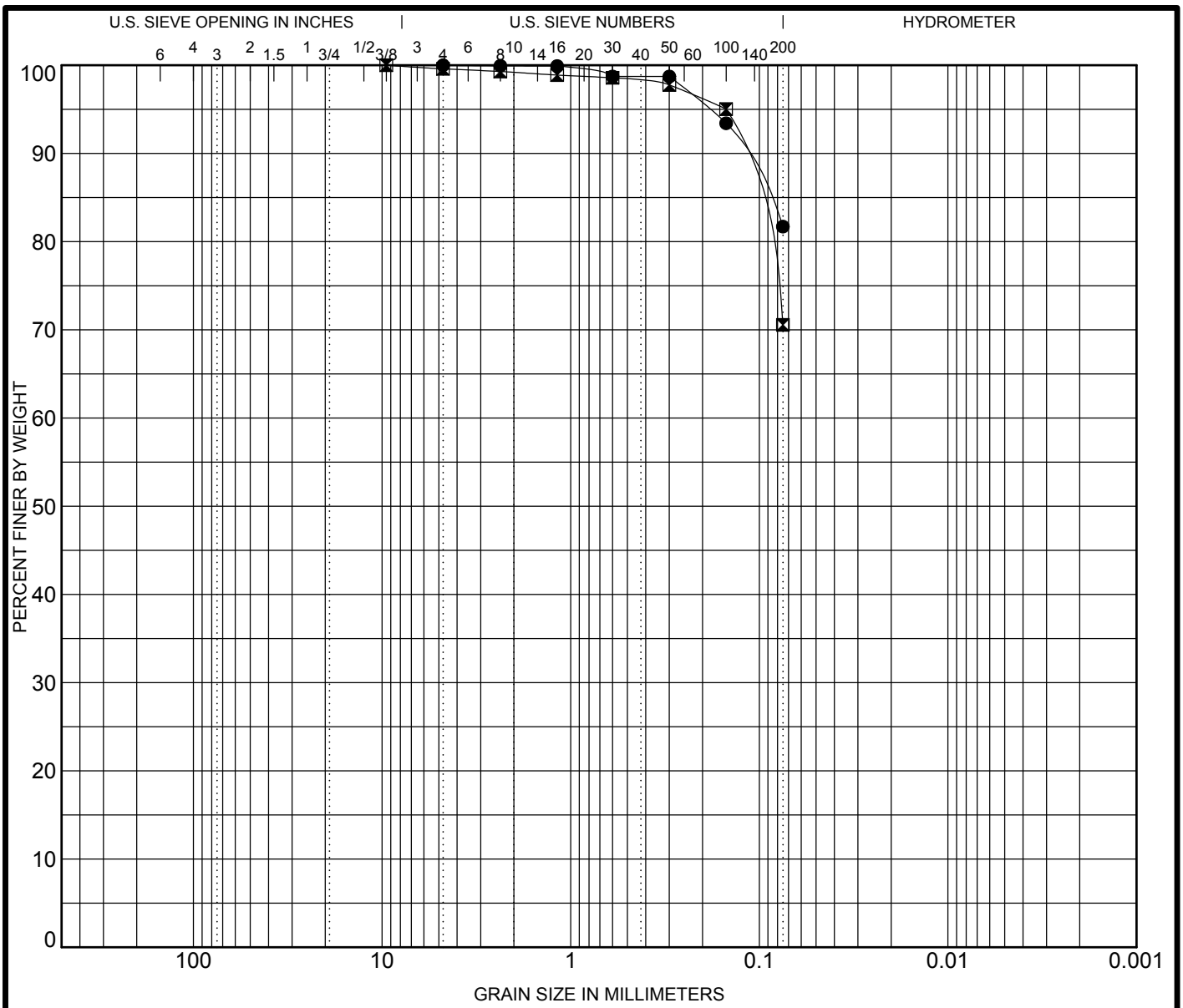

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 2/SA 12 20.12m**	**LEAN CLAY with SAND(CI)**	**43**	**18**	**25**		
⊠	**BH 2/SA 14 23.77m**						

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 2/SA 12 20.12m**	**4.75**				**0.0**	**18.3**	**81.7**	
⊠	**BH 2/SA 14 23.77m**	**9.5**				**0.4**	**29.0**	**70.6**	

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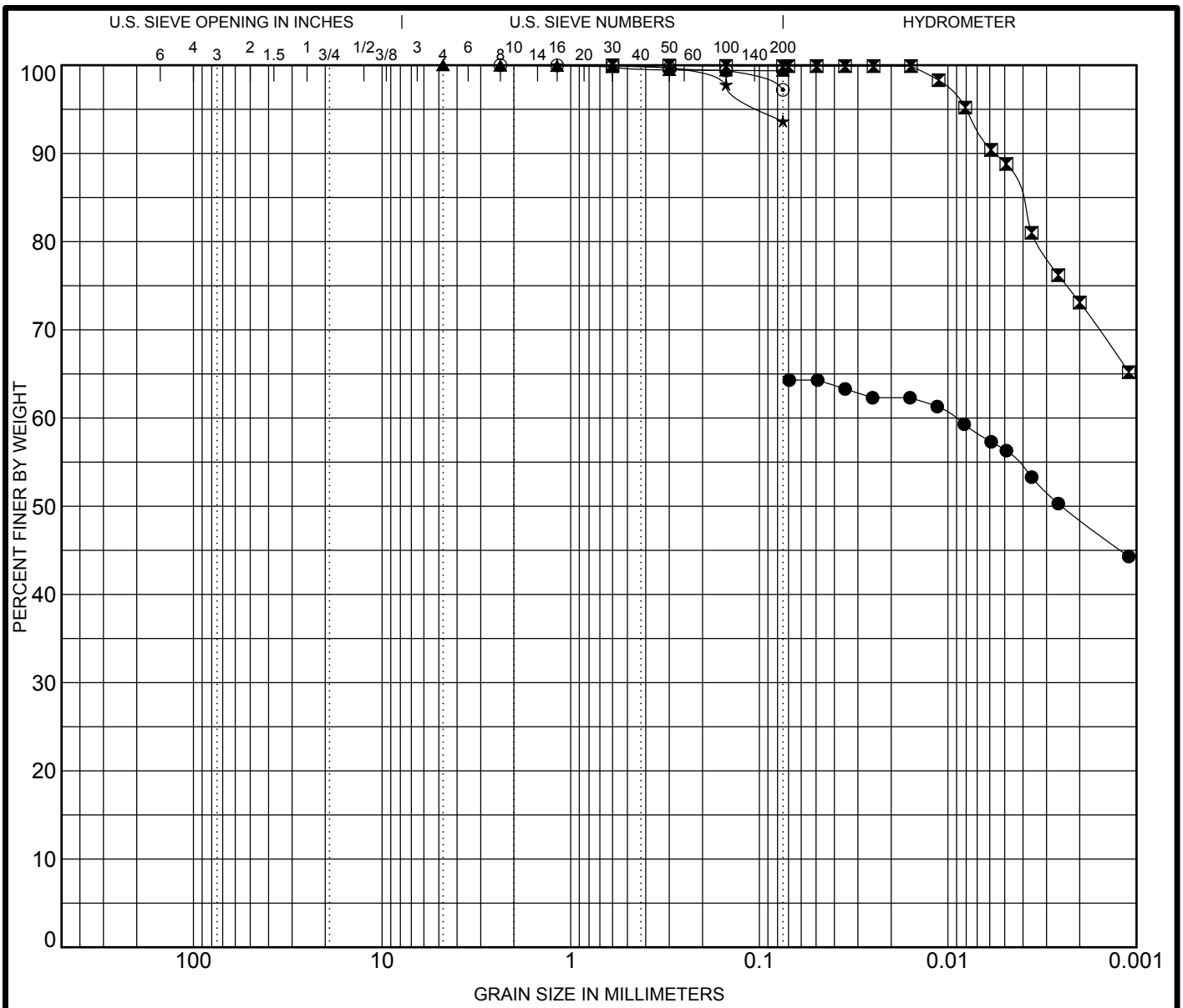

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 3/SA 5	6.40m		59	22	37		
⊠	BH 3/SA 7	9.45m	FAT CLAY(CH)	66	19	47		
▲	BH 3/SA 8	10.97m	FAT CLAY(CH)	68	19	49		
★	BH 3/SA 10	14.02m	LEAN CLAY(CI)	46	13	34		
⊙	BH 3/SA 13	23.16m	FAT CLAY(CH)	60	21	39		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 3/SA 5	6.40m		0.009						48.5
⊠	BH 3/SA 7	9.45m	0.6				0.0	0.1	26.8	73.1
▲	BH 3/SA 8	10.97m	4.75				0.0	0.6	99.4	
★	BH 3/SA 10	14.02m	1.18				0.0	6.3	93.7	
⊙	BH 3/SA 13	23.16m	2.36				0.0	2.8	97.2	

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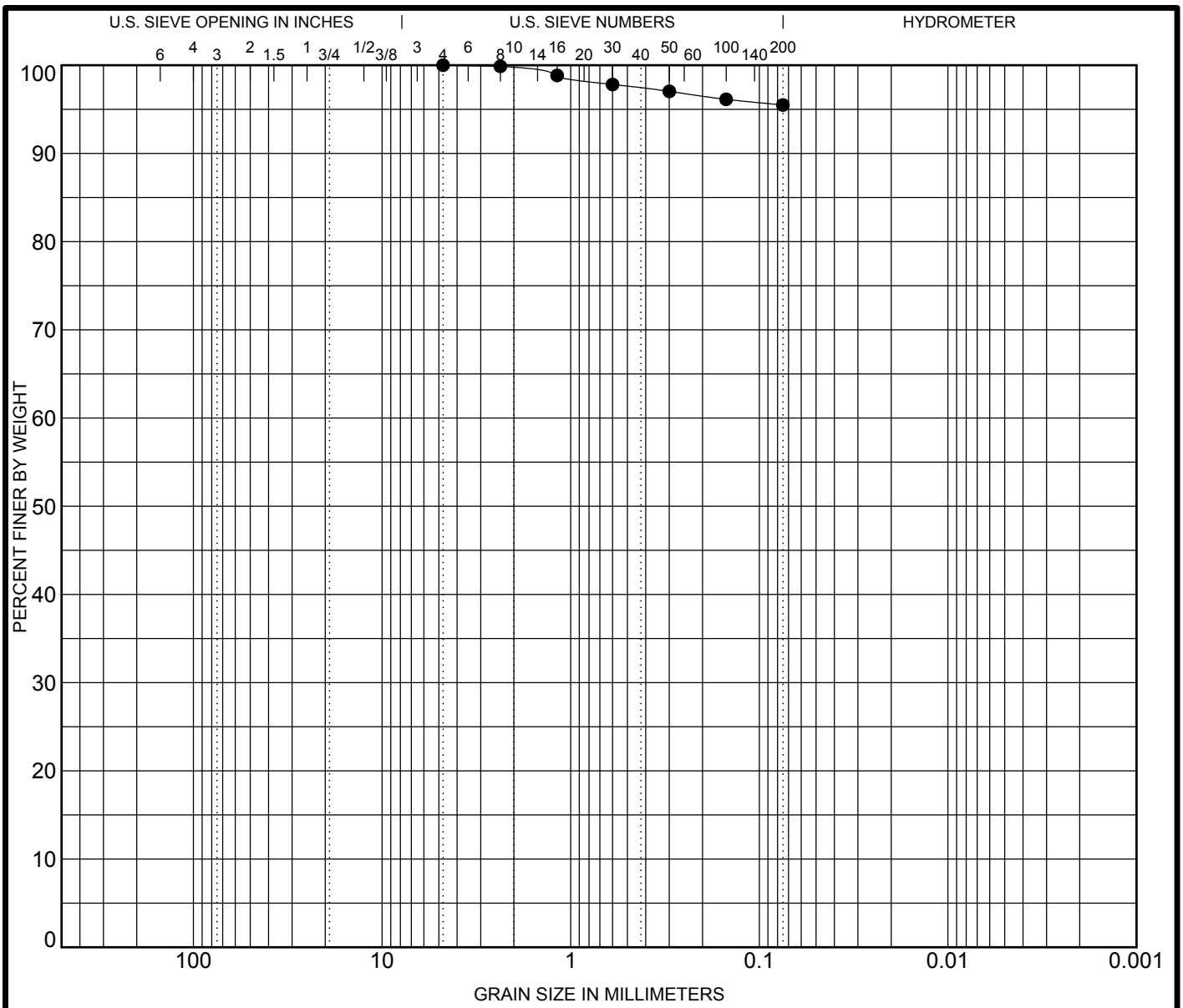

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 3/SA 15 29.26m**	**FAT CLAY(CH)**	**51**	**27**	**24**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 3/SA 15 29.26m**	**4.75**				**0.0**	**4.5**	**95.5**	

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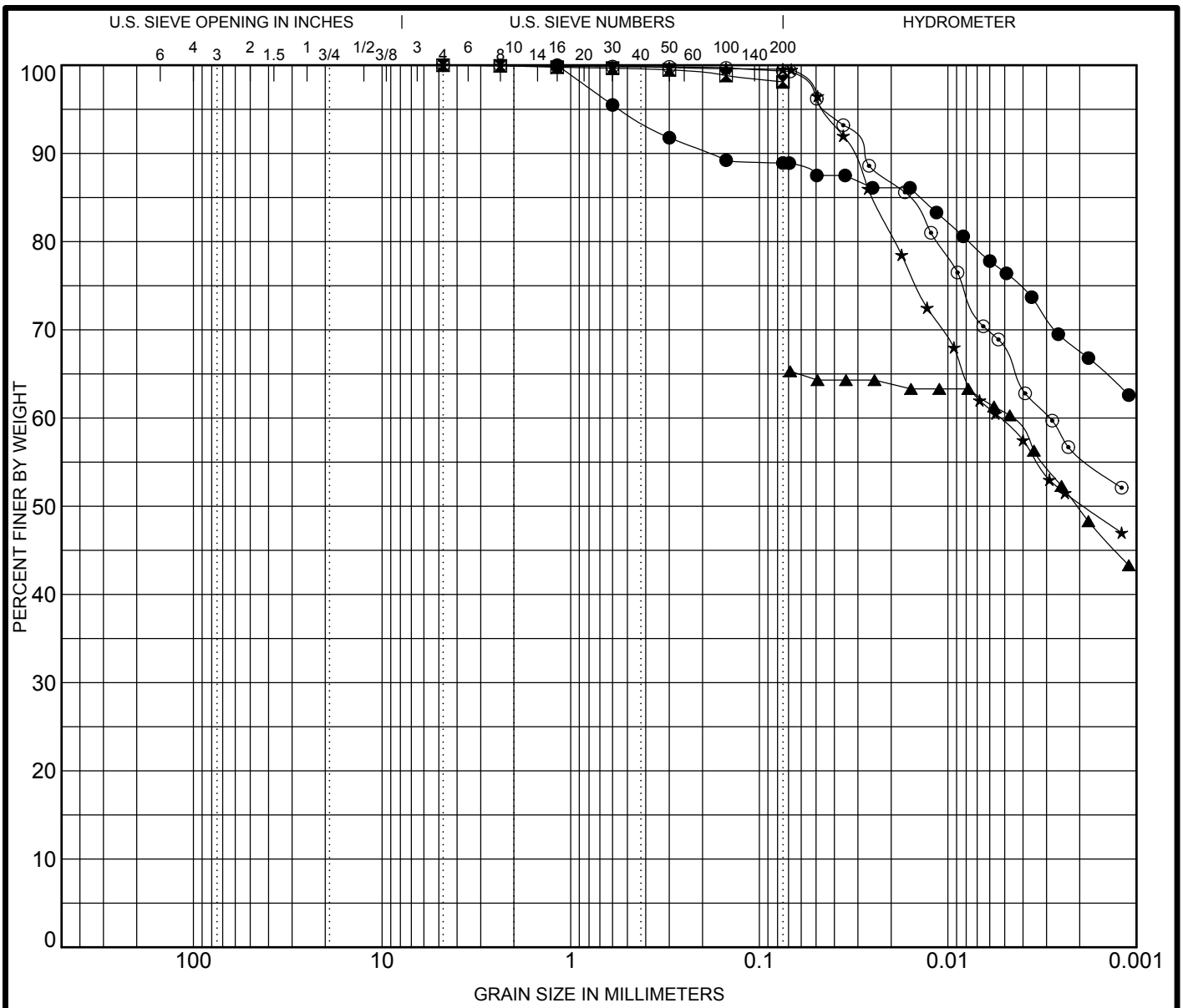

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 4/SA 3	3.35m	FAT CLAY(CH)	69	24	45		
⊠	BH 4/SA 4	4.88m	FAT CLAY(CH)	57	17	40		
▲	BH 4/SA 7	9.45m		65	24	41		
★	BH 4/SA 9	12.50m	FAT CLAY(CH)	65	18	47		
⊙	BH 4/SA 13	23.16m	FAT CLAY(CH)	81	20	61		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 4/SA 3	3.35m	1.18				0.0	11.1	21.3	67.6
⊠	BH 4/SA 4	4.88m	4.75				0.0	1.9	98.1	
▲	BH 4/SA 7	9.45m		0.005						49.6
★	BH 4/SA 9	12.50m	4.75	0.005			0.0	0.5	49.2	50.3
⊙	BH 4/SA 13	23.16m	4.75	0.003			0.0	0.7	43.6	55.7

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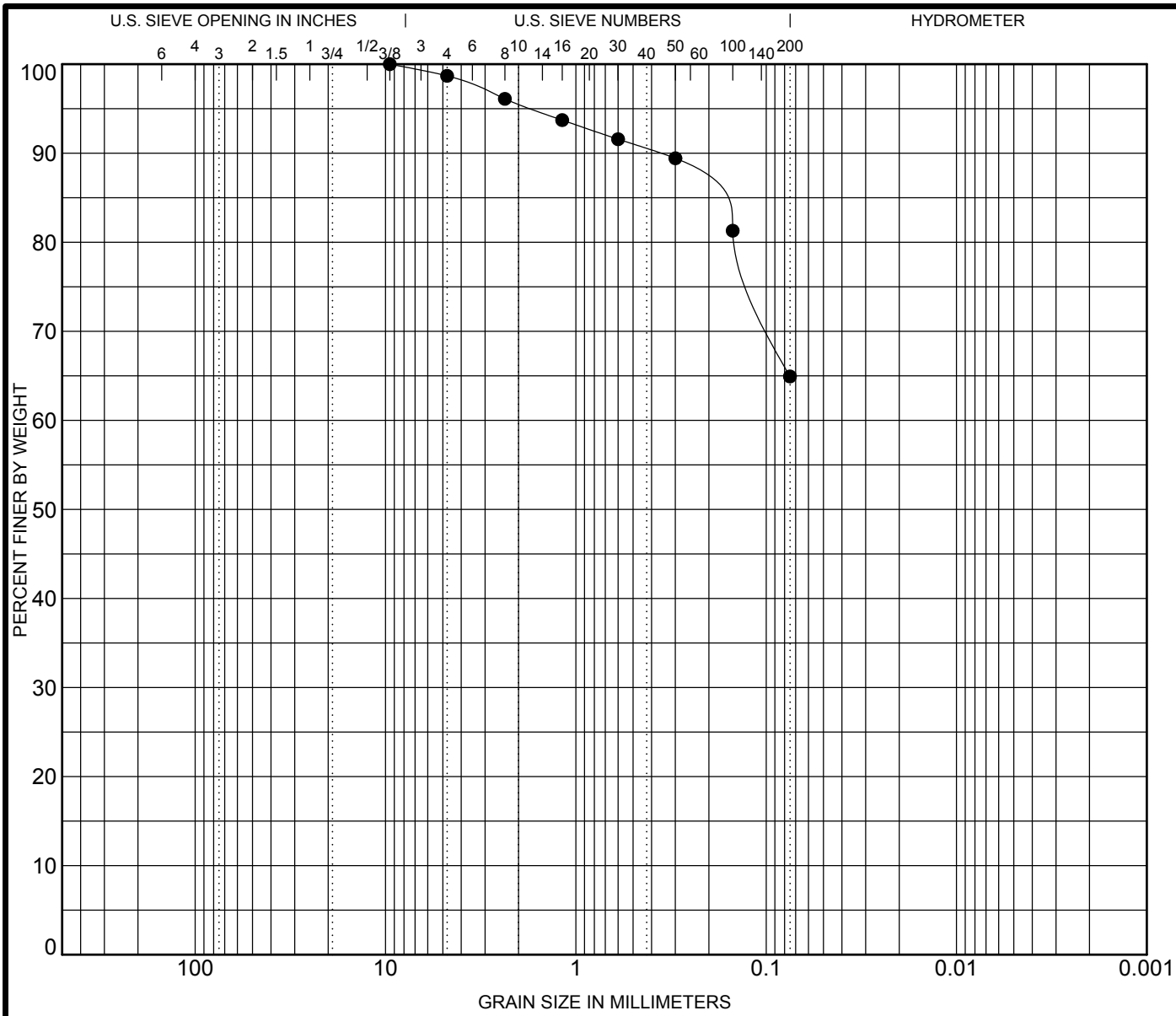

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 4/SA 15 29.26m**	**SANDY FAT CLAY(CH)**	**51**	**16**	**35**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 4/SA 15 29.26m**	**9.5**				**1.3**	**33.8**	**64.9**	

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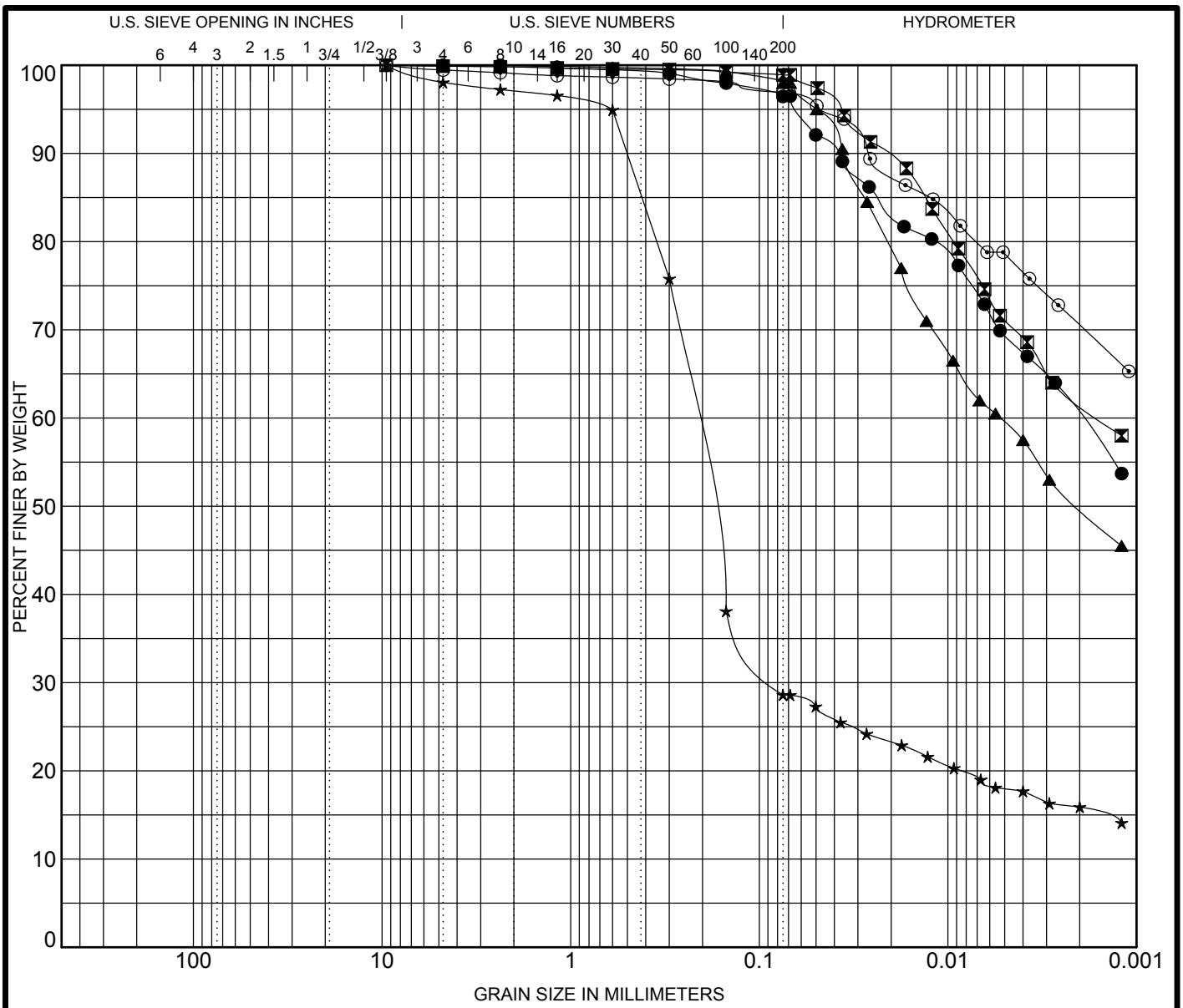

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 5/SA 3	3.35m	FAT CLAY(CH)	58	22	36		
⊠	BH 5/SA 4	4.88m	FAT CLAY(CH)	52	21	31		
▲	BH 5/SA 5	6.40m	LEAN CLAY(CI)	48	20	28		
★	BH 5/SA 7	9.45m	CLAYEY SAND(SC)	40	17	23		
⊙	BH 5/SA 9	12.50m	FAT CLAY(CH)	59	20	39		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 5/SA 3	3.35m	4.75	0.002			0.0	3.5	36.3	60.2
⊠	BH 5/SA 4	4.88m	9.5	0.002			0.1	1.0	37.3	61.6
▲	BH 5/SA 5	6.40m	4.75	0.005			0.0	2.0	48.1	49.8
★	BH 5/SA 7	9.45m	9.5	0.224	0.083		1.9	69.4	12.7	15.9
⊙	BH 5/SA 9	12.50m	9.5				0.5	2.5	26.4	70.5

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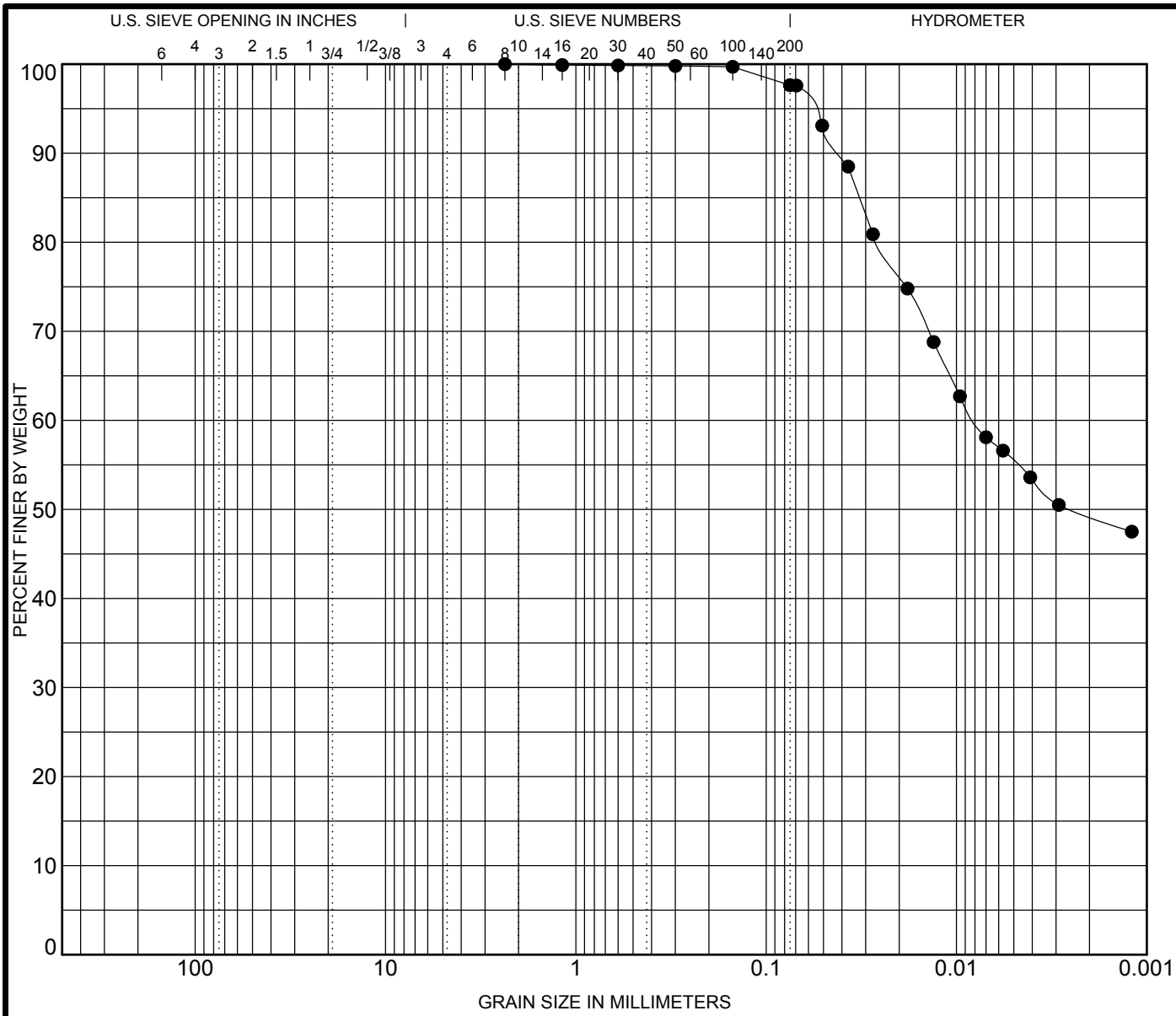

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 5/SA 12 20.12m**	**LEAN CLAY(CI)**	**36**	**16**	**20**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 5/SA 12 20.12m**	**2.36**	**0.008**			**0.0**	**2.4**	**48.4**	**49.2**

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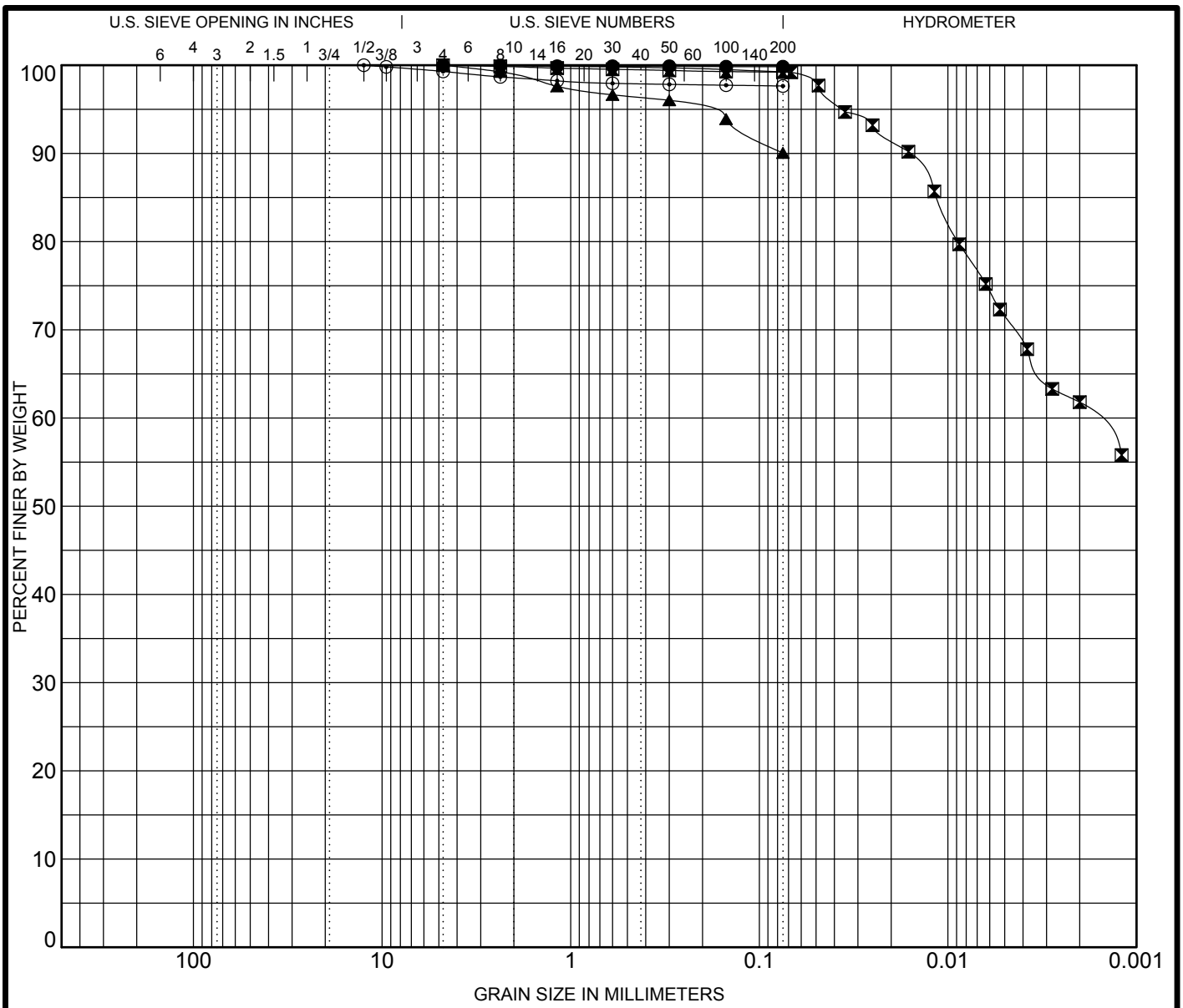

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 6/SA 4	4.88m	FAT CLAY(CH)	63	20	43		
⊠	BH 6/SA 7	9.45m	FAT CLAY(CH)	61	20	41		
▲	BH 6/SA 10	14.02m	LEAN CLAY(CI)	41	17	24		
★	BH 6/SA 12	20.12m	FAT CLAY(CH)	66	21	45		
⊙	BH 6/SA 14	26.21m	FAT CLAY(CH)	63	26	37		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 6/SA 4	4.88m	4.75				0.0	0.2	99.8	
⊠	BH 6/SA 7	9.45m	4.75	0.002			0.0	0.8	37.4	61.8
▲	BH 6/SA 10	14.02m	4.75				0.0	9.9	90.1	
★	BH 6/SA 12	20.12m	2.36				0.0	0.7	99.3	
⊙	BH 6/SA 14	26.21m	12.5				0.7	1.7	97.6	

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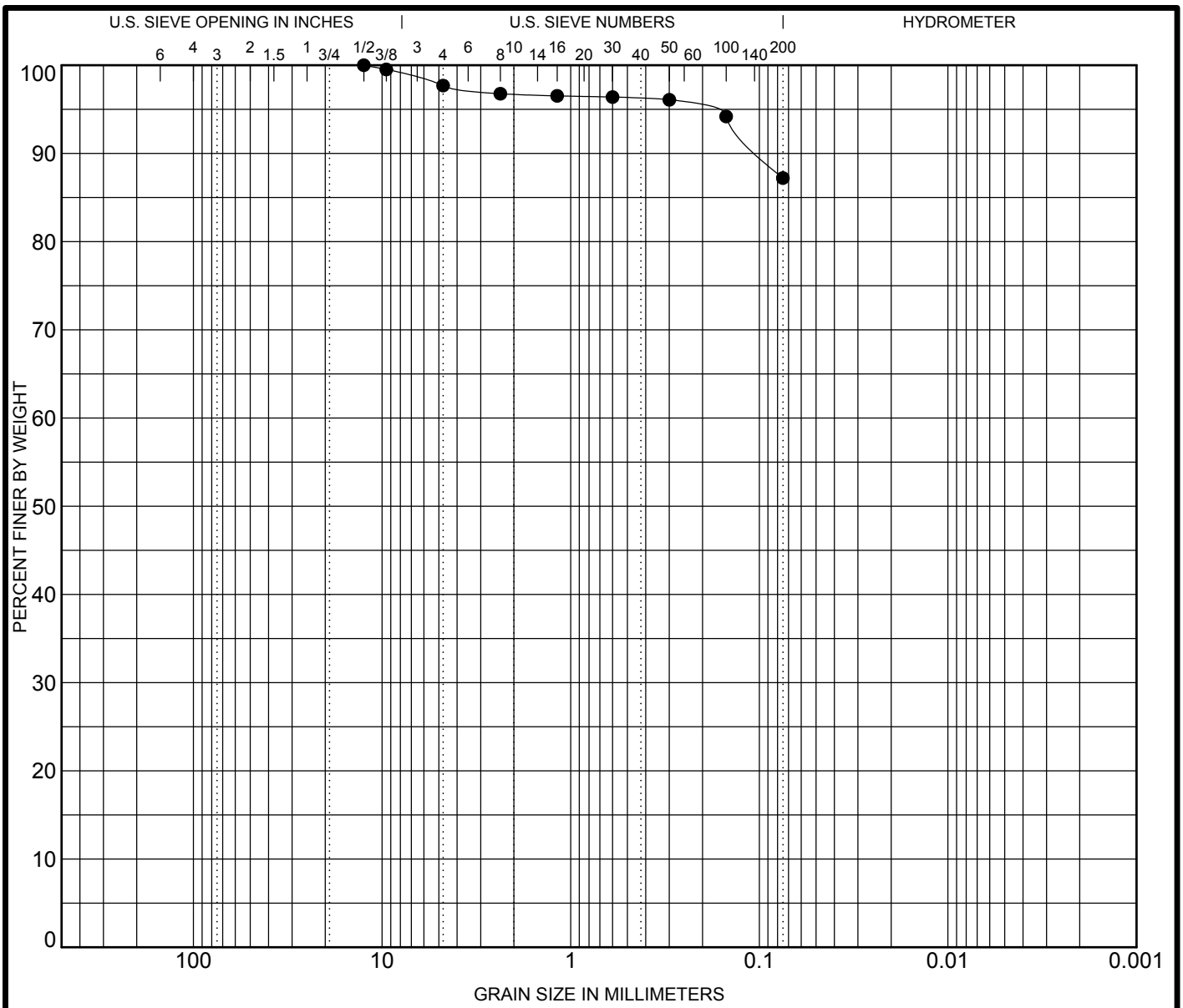

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 6/SA 16 30.78m**	**LEAN CLAY(CI)**	**44**	**15**	**29**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 6/SA 16 30.78m**	**12.5**				**2.3**	**10.5**	**87.2**	

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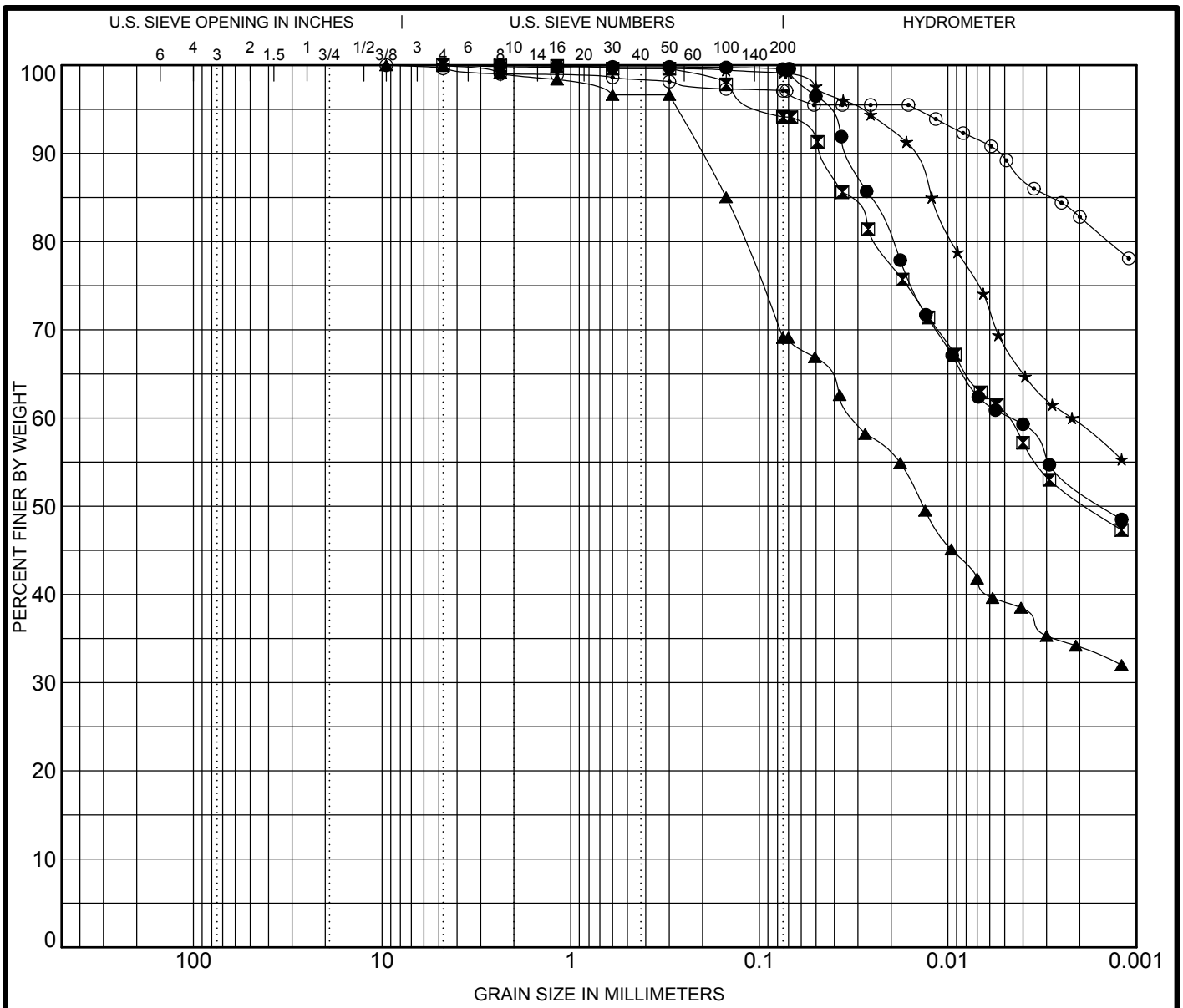

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 7/SA 3	3.35m	LEAN CLAY(CI)	49	18	31		
⊠	BH 7/SA 5	6.40m	FAT CLAY(CH)	57	19	38		
▲	BH 7/SA 7	9.45m	SANDY LEAN CLAY(CL)	28	17	11		
★	BH 7/SA 10	14.02m	FAT CLAY(CH)	56	21	35		
⊙	BH 7/SA 13	23.16m	FAT CLAY(CH)	82	24	58		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 7/SA 3	3.35m	2.36	0.005			0.0	0.4	47.5	52.1
⊠	BH 7/SA 5	6.40m	4.75	0.005			0.0	5.9	43.5	50.6
▲	BH 7/SA 7	9.45m	9.5	0.031			0.1	30.9	35.1	34.0
★	BH 7/SA 10	14.02m	4.75	0.002			0.0	0.9	39.9	59.3
⊙	BH 7/SA 13	23.16m	9.5				0.4	2.5	14.3	82.8

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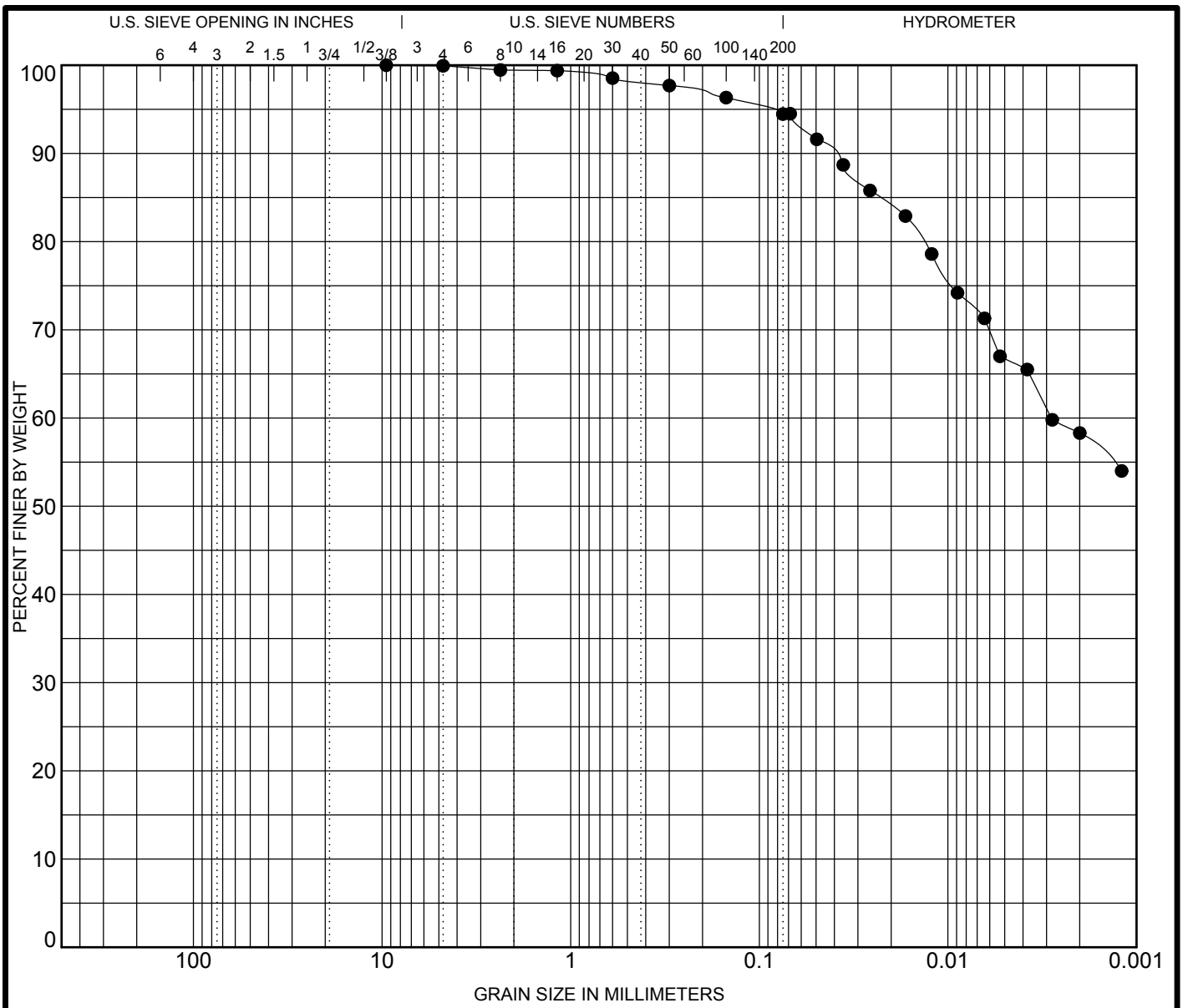
Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

EISL SIEVE 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 7/SA 15 29.26m**	**LEAN CLAY(CI)**	**46**	**17**	**29**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 7/SA 15 29.26m**	**9.5**	**0.003**			**0.1**	**5.5**	**36.2**	**58.3**

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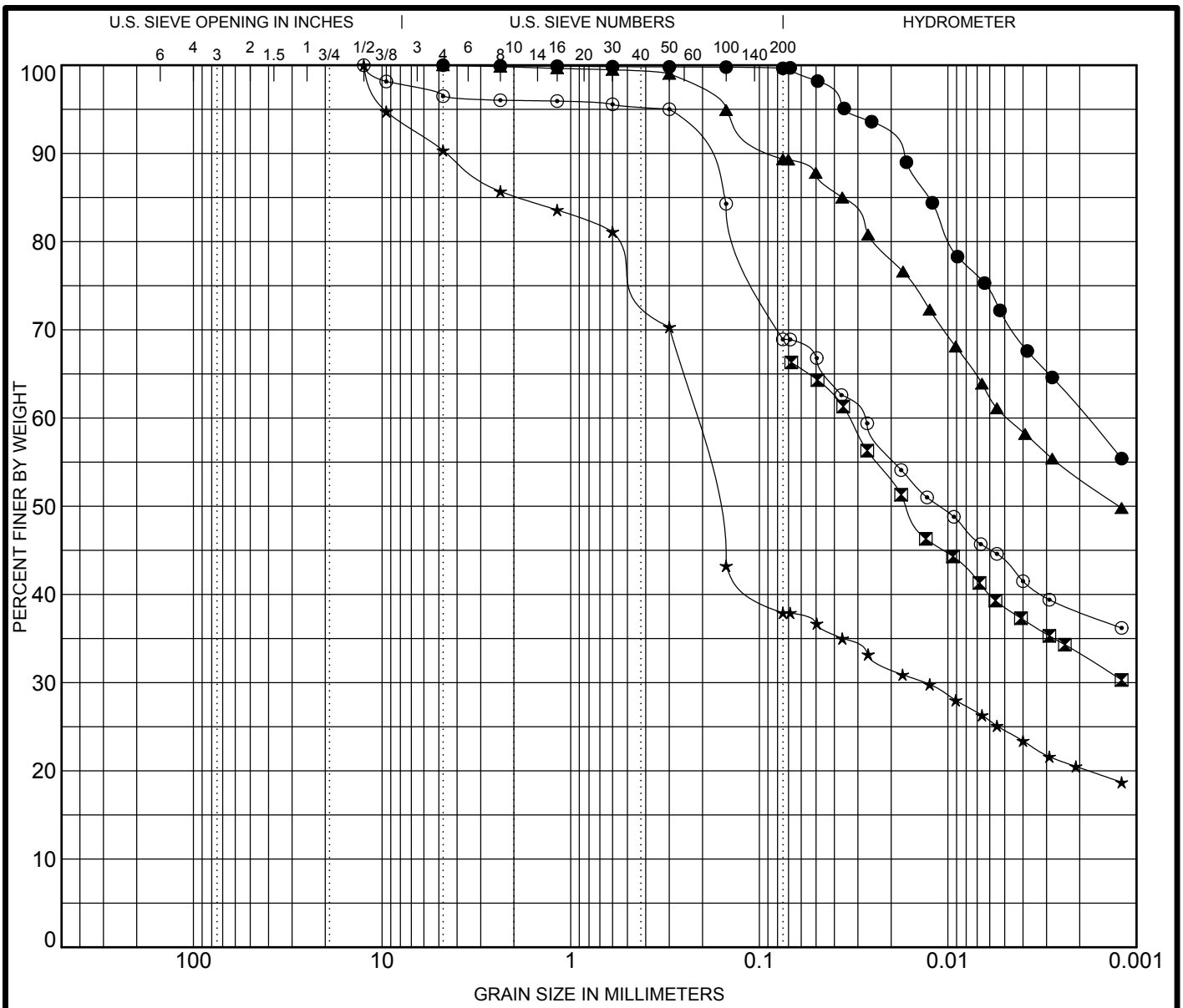
Type: SITE INVESTIGATION

EISL SIEVE 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH 8/SA 3	3.35m	FAT CLAY(CH)	51	19	32		
⊠	BH 8/SA 5	6.40m		45	18	27		
▲	BH 8/SA 6	7.92m	LEAN CLAY(CI)	38	15	23		
★	BH 8/SA 8	10.97m						
⊙	BH 8/SA 11	17.07m	SANDY LEAN CLAY(CI)	32	15	17		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 8/SA 3	3.35m	4.75	0.002			0.0	0.4	38.7	60.9
⊠	BH 8/SA 5	6.40m		0.033						33.2
▲	BH 8/SA 6	7.92m	4.75	0.005			0.0	10.7	36.2	53.2
★	BH 8/SA 8	10.97m	12.5	0.23	0.013		9.7	52.4	17.6	20.3
⊙	BH 8/SA 11	17.07m	12.5	0.028			3.5	27.6	30.9	38.1

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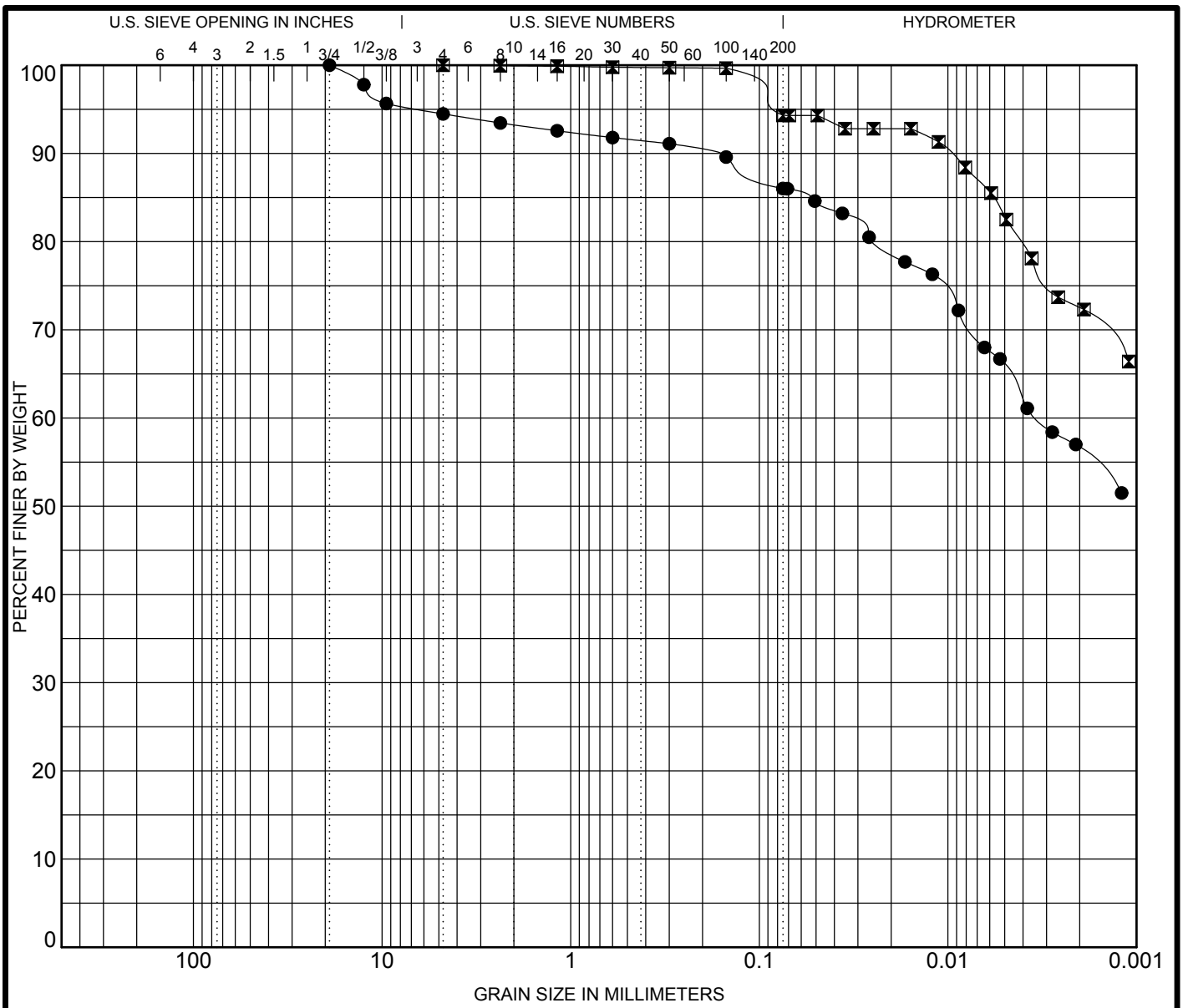

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 8/SA 12 20.12m**	**LEAN CLAY(CI)**	**44**	**18**	**26**		
⊠	**BH 8/SA 14 26.21m**	**FAT CLAY(CH)**	**62**	**16**	**46**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 8/SA 12 20.12m**	**19**	**0.003**			**5.5**	**8.5**	**29.5**	**56.5**
⊠	**BH 8/SA 14 26.21m**	**4.75**				**0.0**	**5.7**	**21.8**	**72.5**

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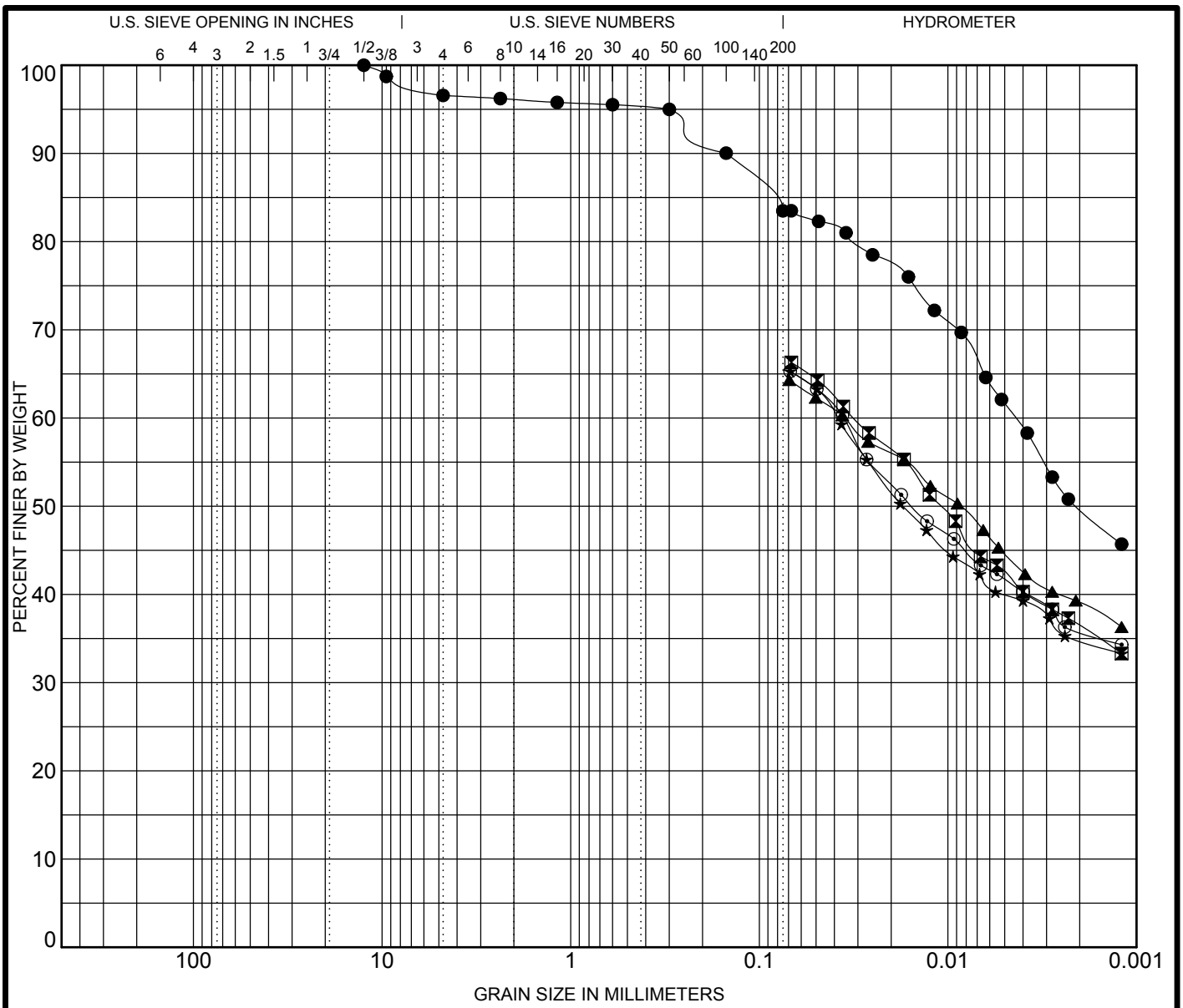

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	**BH 9/SA 3**	**3.35m**	**FAT CLAY with SAND(CH)**	**60**	**20**	**40**		
⊠	**BH 9/SA 5**	**6.40m**		**49**	**17**	**32**		
▲	**BH 9/SA 6**	**7.92m**		**39**	**14**	**25**		
★	**BH 9/SA 7**	**9.45m**		**35**	**17**	**18**		
⊙	**BH 9/SA 9**	**12.50m**		**30**	**14**	**16**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 9/SA 3**	**3.35m**	**12.5**	**0.004**			**3.4**	**13.1**	**33.8**	**49.7**
⊠	**BH 9/SA 5**	**6.40m**		**0.031**						**36.4**
▲	**BH 9/SA 6**	**7.92m**		**0.035**						**39.0**
★	**BH 9/SA 7**	**9.45m**		**0.039**						**34.8**
⊙	**BH 9/SA 9**	**12.50m**		**0.036**						**35.8**

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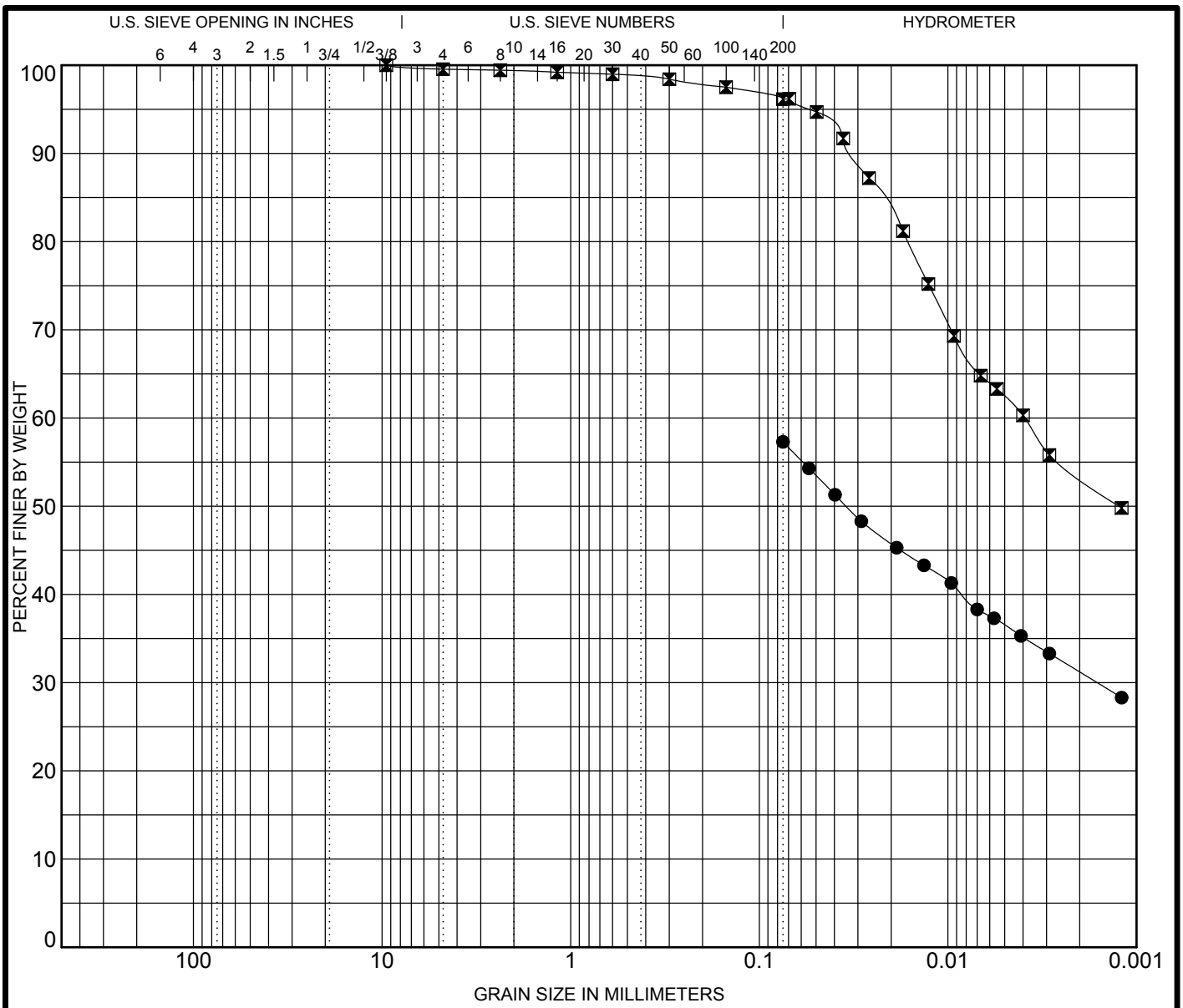

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH 9/SA 12 20.12m**		**NP**	**NP**	**NP**		
⊠	**BH 9/SA 16 30.78m**	**FAT CLAY(CH)**	**56**	**17**	**39**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 9/SA 12 20.12m**			**0.002**					**31.2**
⊠	**BH 9/SA 16 30.78m**	**9.5**	**0.004**			**0.5**	**3.4**	**42.9**	**53.3**

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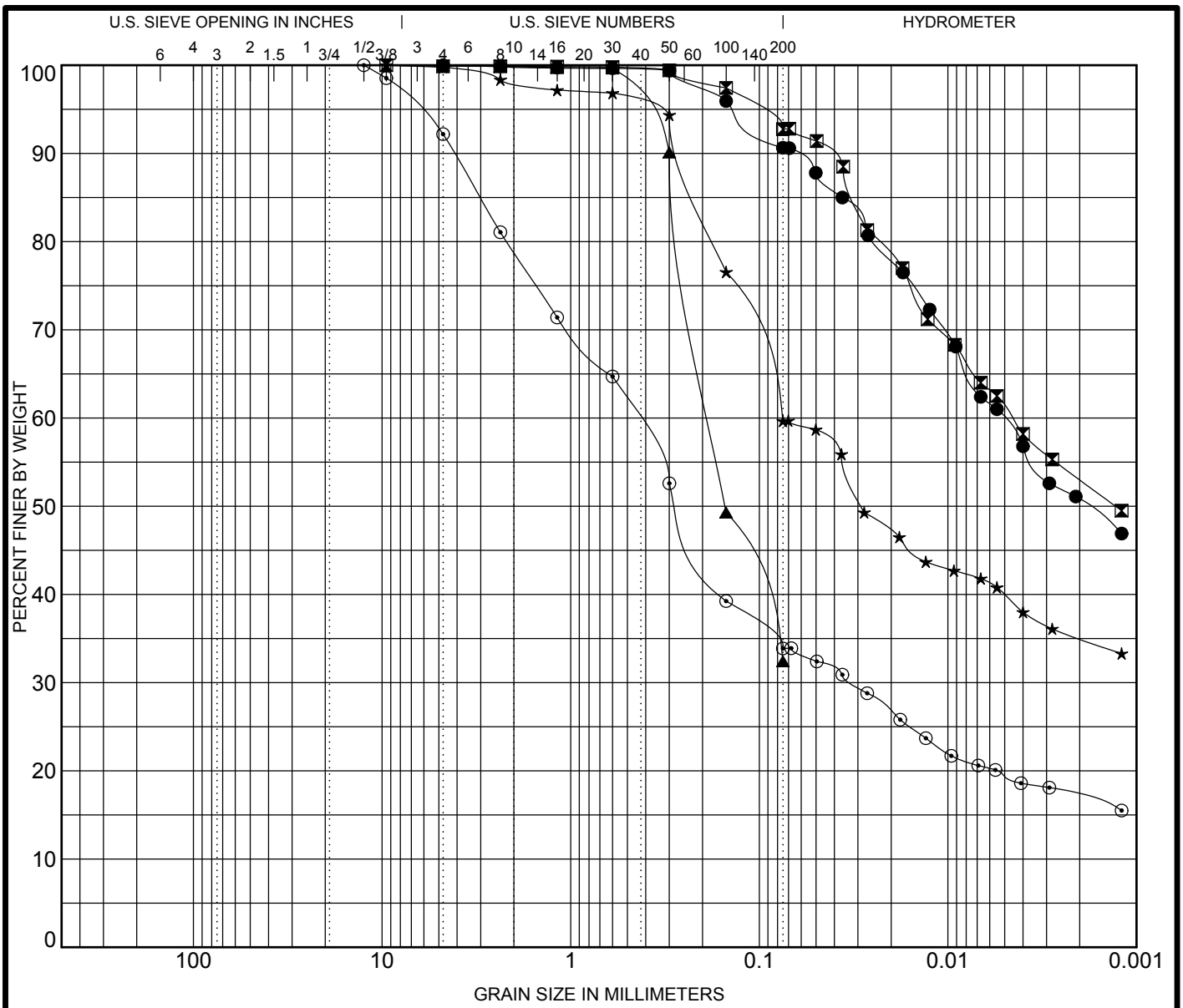

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH10/SA 3	3.35m	LEAN CLAY(CI)	44	19	25		
⊠	BH10/SA 5	6.40m	LEAN CLAY(CI)	47	15	32		
▲	BH10/SA 7	9.45m	CLAYEY SAND(SC)	29	15	14		
★	BH10/SA 10	14.02m	SANDY LEAN CLAY(CL)	27	14	13		
⊙	BH10/SA 12	20.12m	CLAYEY SAND(SC)	26	14	12		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH10/SA 3	3.35m	4.75	0.005			0.0	9.4	39.9	50.7
⊠	BH10/SA 5	6.40m	9.5	0.005			0.1	7.1	39.8	53.0
▲	BH10/SA 7	9.45m	4.75	0.18			0.0	67.6	32.4	
★	BH10/SA 10	14.02m	9.5	0.071			0.2	40.1	24.7	35.0
⊙	BH10/SA 12	20.12m	12.5	0.458	0.032		7.8	58.3	16.9	17.0

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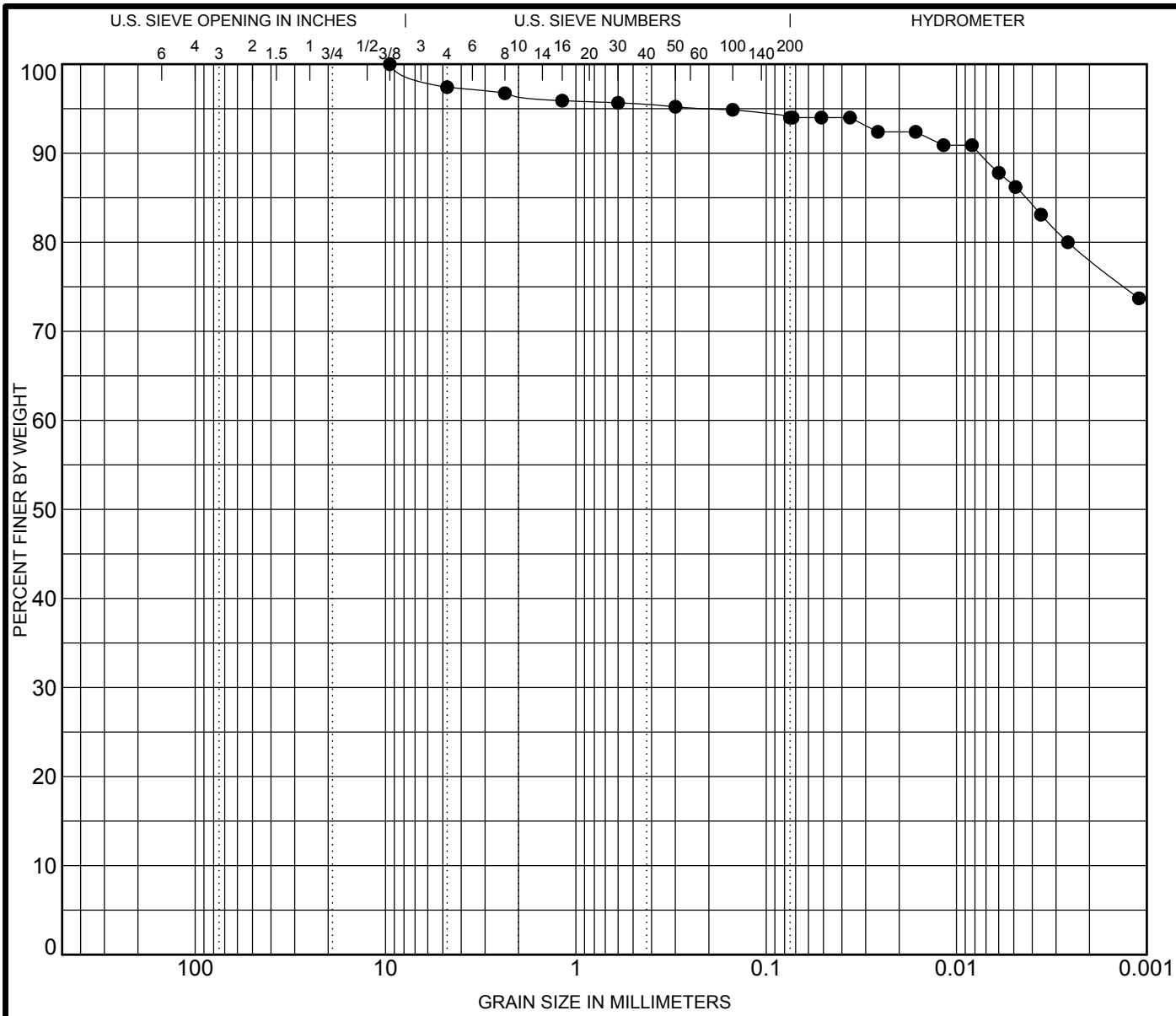

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH10/SA 14 26.21m**	**FAT CLAY(CH)**	**78**	**25**	**53**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH10/SA 14 26.21m**	**9.5**				**2.6**	**3.4**	**15.9**	**78.1**

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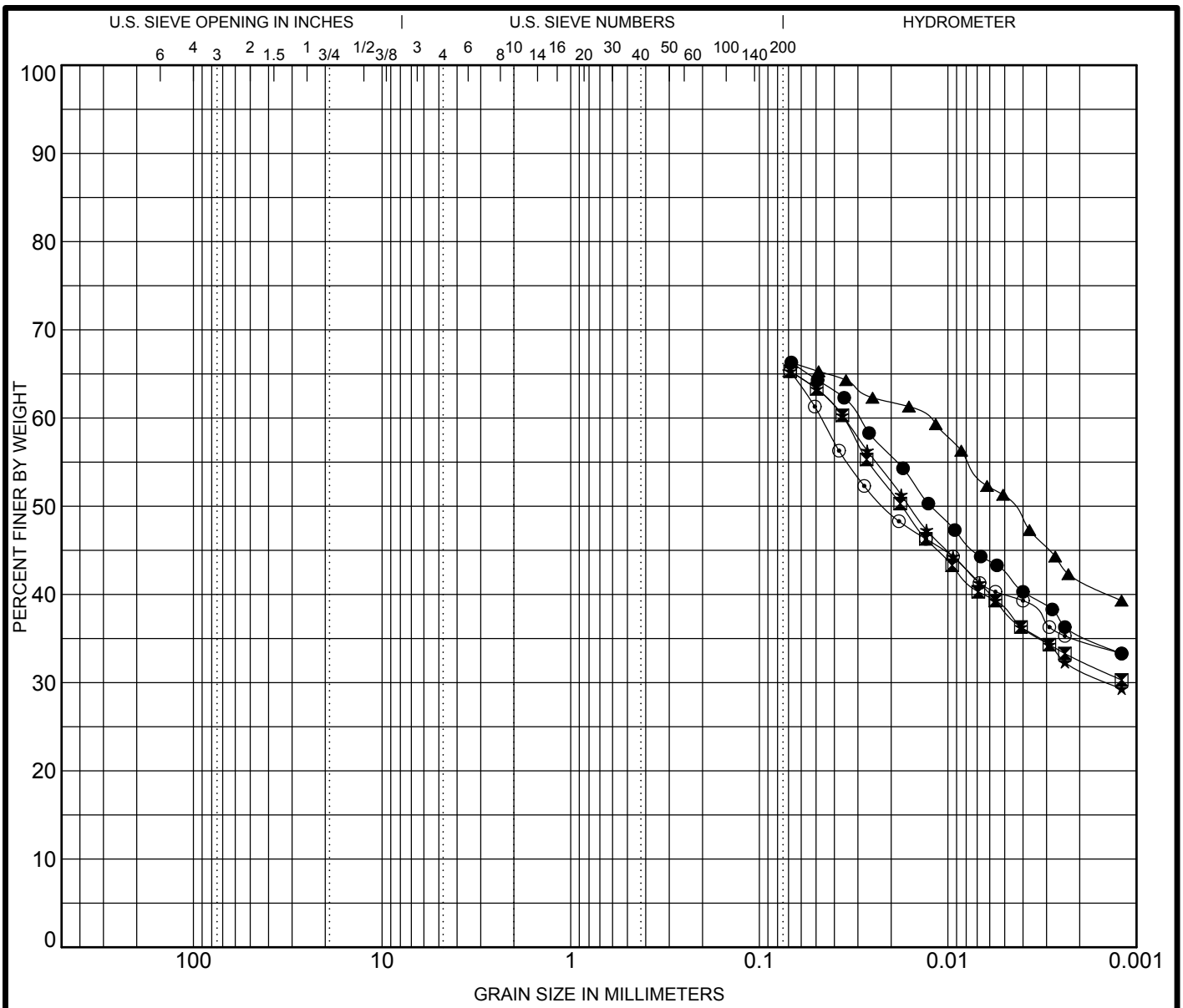

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH11/SA 3	3.35m		49	19	30		
⊠	BH11/SA 5	6.40m		38	17	21		
▲	BH11/SA 6	7.92m		60	26	34		
★	BH11/SA 7	9.45m		40	19	21		
⊙	BH11/SA 11	17.07m		30	14	16		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH11/SA 3	3.35m		0.03						35.5
⊠	BH11/SA 5	6.40m		0.036						32.5
▲	BH11/SA 6	7.92m		0.013						41.7
★	BH11/SA 7	9.45m		0.035	0.001					31.5
⊙	BH11/SA 11	17.07m		0.047						34.8

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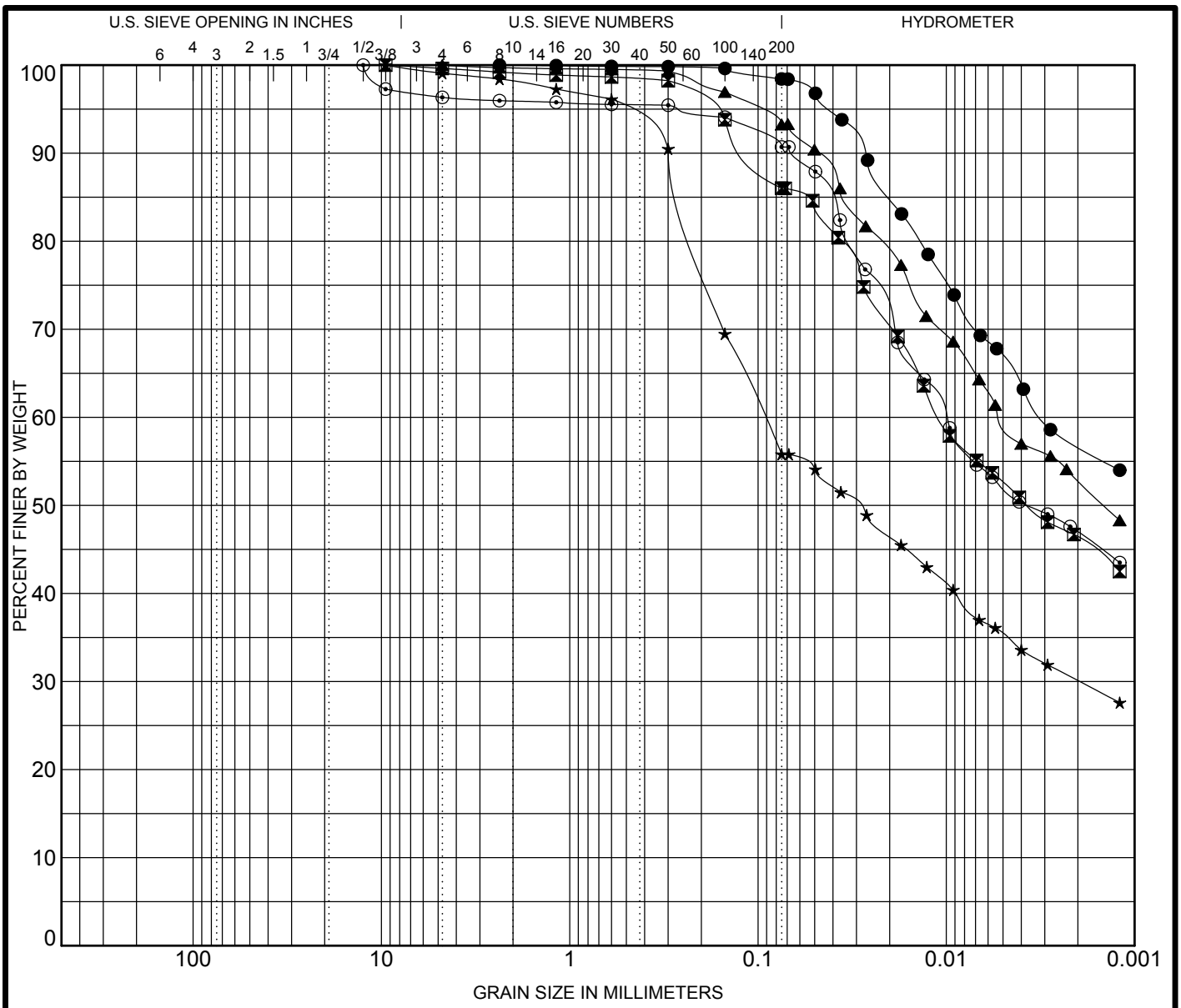

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH12/SA 3	3.35m	FAT CLAY(CH)	52	23	29		
⊠	BH12/SA 6	6.40m	LEAN CLAY(CI)	40	14	26		
▲	BH12/SA 7	7.92m	FAT CLAY(CH)	52	18	34		
★	BH12/SA 10	12.50m	SANDY LEAN CLAY(CI)	36	16	20		
⊙	BH12/SA 11	14.02m	LEAN CLAY(CI)	45	16	29		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH12/SA 3	3.35m	2.36	0.003			0.0	1.6	41.7	56.8
⊠	BH12/SA 6	6.40m	9.5	0.011			0.4	13.6	39.7	46.3
▲	BH12/SA 7	7.92m	4.75	0.005			0.0	6.7	40.4	52.9
★	BH12/SA 10	12.50m	9.5	0.093	0.002		0.9	43.3	25.7	30.1
⊙	BH12/SA 11	14.02m	12.5	0.01			3.7	5.6	43.7	47.0

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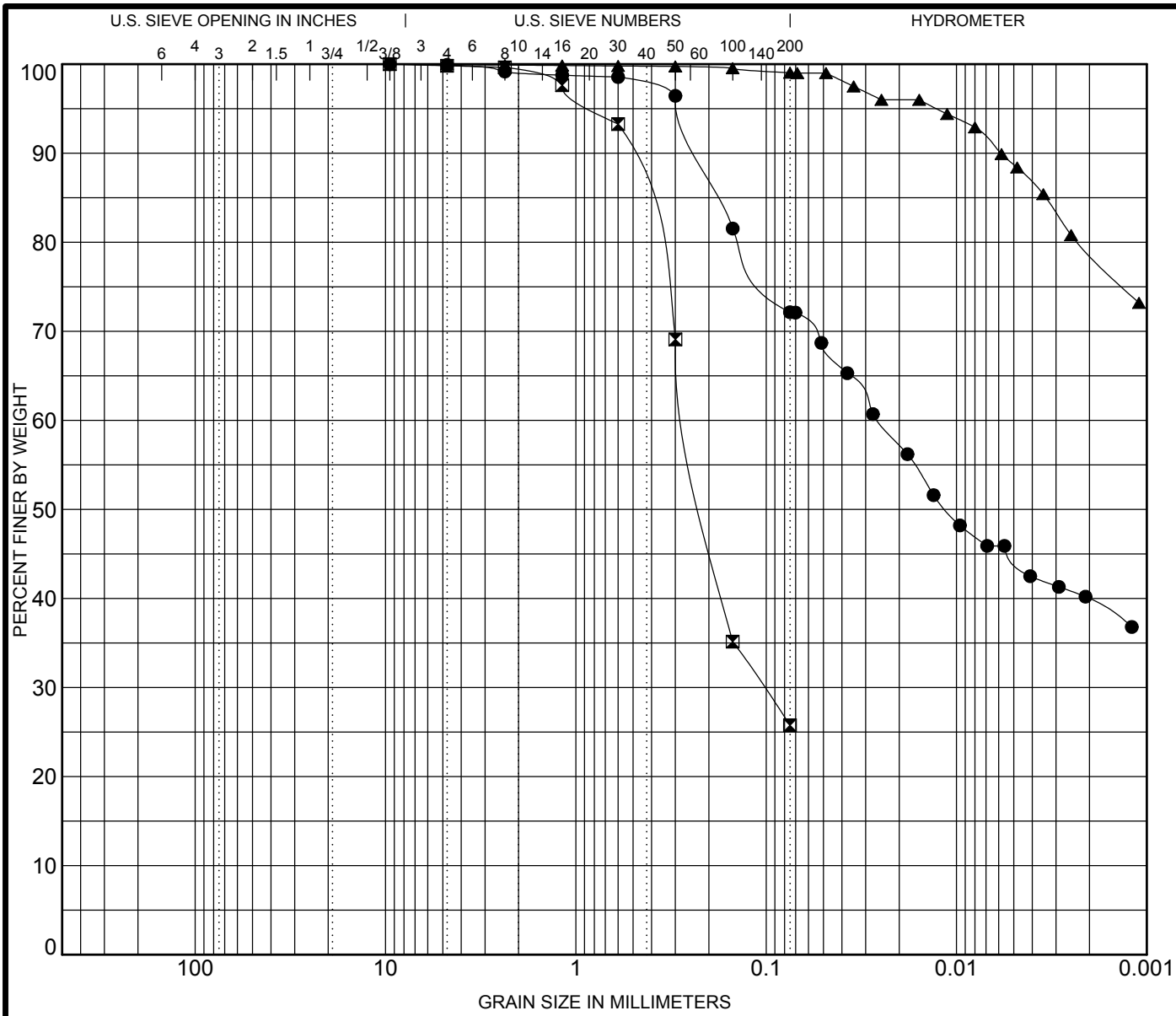

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH12/SA 12 17.07m**	**LEAN CLAY with SAND(CI)**	**30**	**13**	**17**		
⊠	**BH12/SA 14 23.16m**	**CLAYEY SAND(SC)**	**29**	**13**	**16**		
▲	**BH12/SA 16 29.26m**	**FAT CLAY(CH)**	**75**	**23**	**52**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH12/SA 12 17.07m**	**9.5**	**0.026**			**0.1**	**27.8**	**32.2**	**39.9**
⊠	**BH12/SA 14 23.16m**	**9.5**	**0.249**	**0.103**		**0.2**	**74.1**	**25.8**	
▲	**BH12/SA 16 29.26m**	**4.75**				**0.0**	**1.0**	**20.3**	**78.7**

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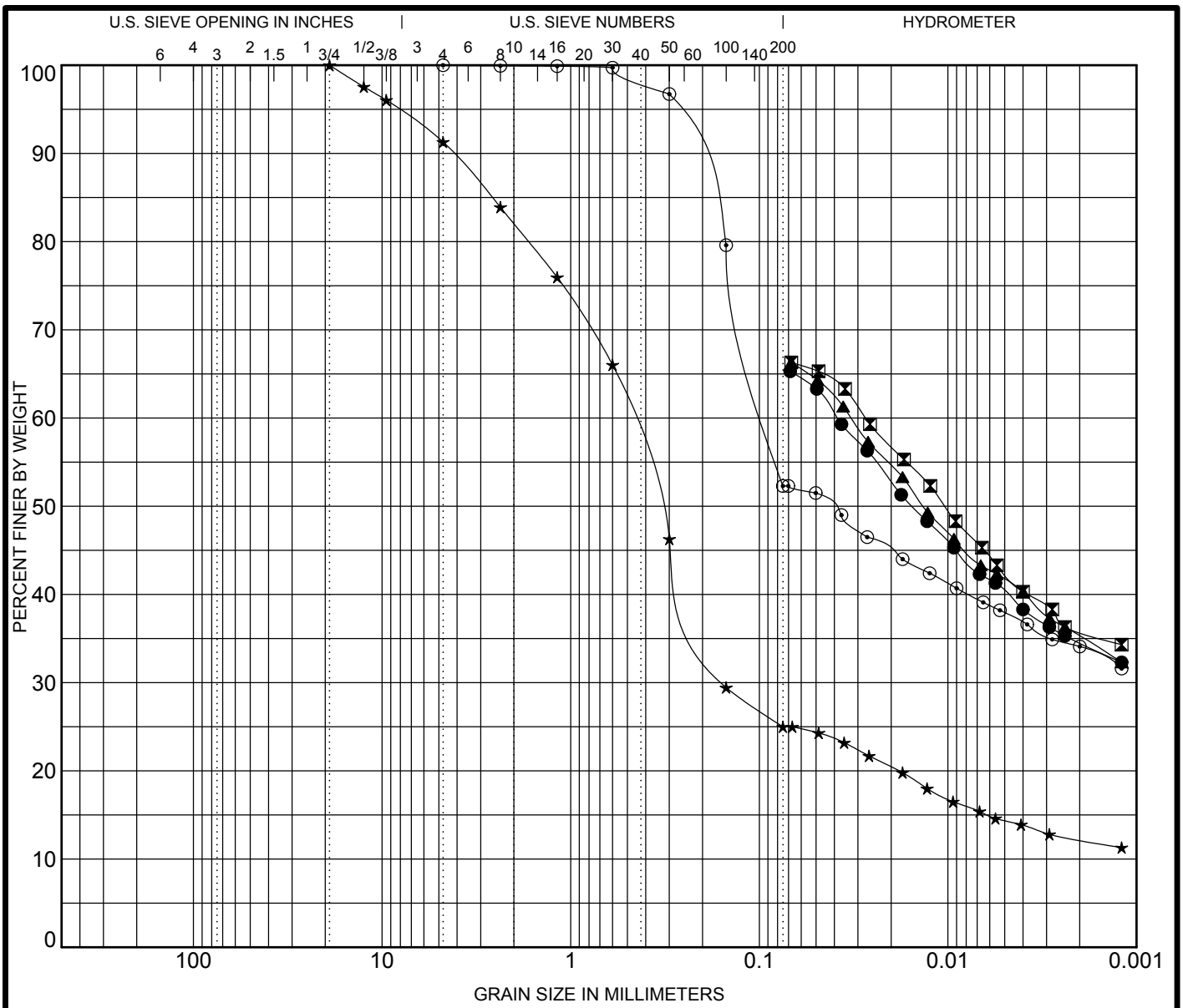

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● BH13/SA 3 3.35m		55	19	36		
⊠ BH13/SA 5 6.40m		49	16	33		
▲ BH13/SA 7 9.45m		55	20	35		
★ BH13/SA 11 17.07m						
⊙ BH13/SA 13 23.16m	SANDY LEAN CLAY(CL)	26	14	12		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● BH13/SA 3 3.35m		0.039						34.5
⊠ BH13/SA 5 6.40m		0.027						35.8
▲ BH13/SA 7 9.45m		0.033						35.2
★ BH13/SA 11 17.07m	19	0.486	0.153		8.7	66.3	12.8	12.2
⊙ BH13/SA 13 23.16m	4.75	0.087			0.0	47.7	18.2	34.1

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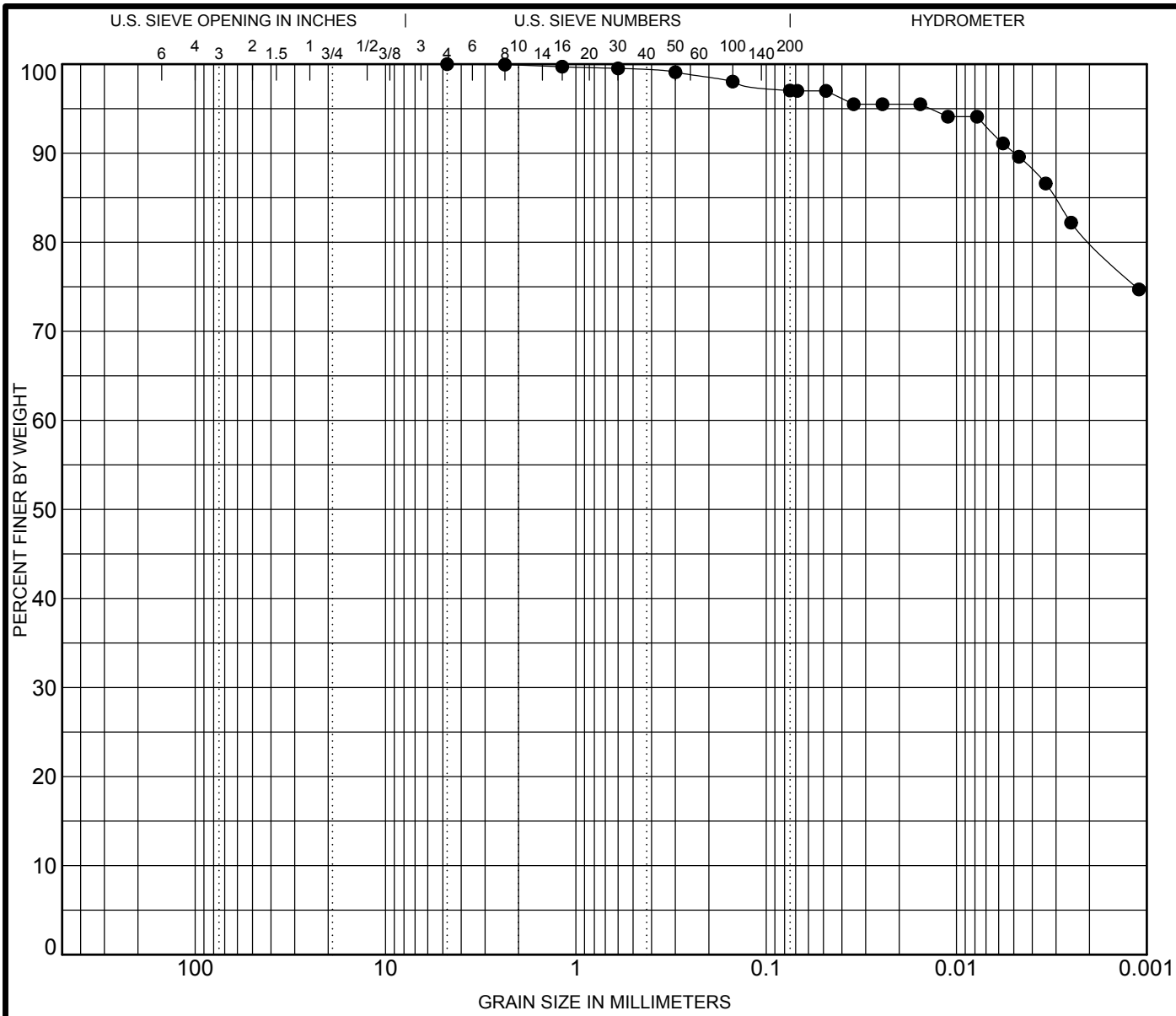

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH13/SA 15 29.26m**	**FAT CLAY(CH)**	**70**	**22**	**48**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH13/SA 15 29.26m**	**4.75**				**0.0**	**3.0**	**16.9**	**80.2**

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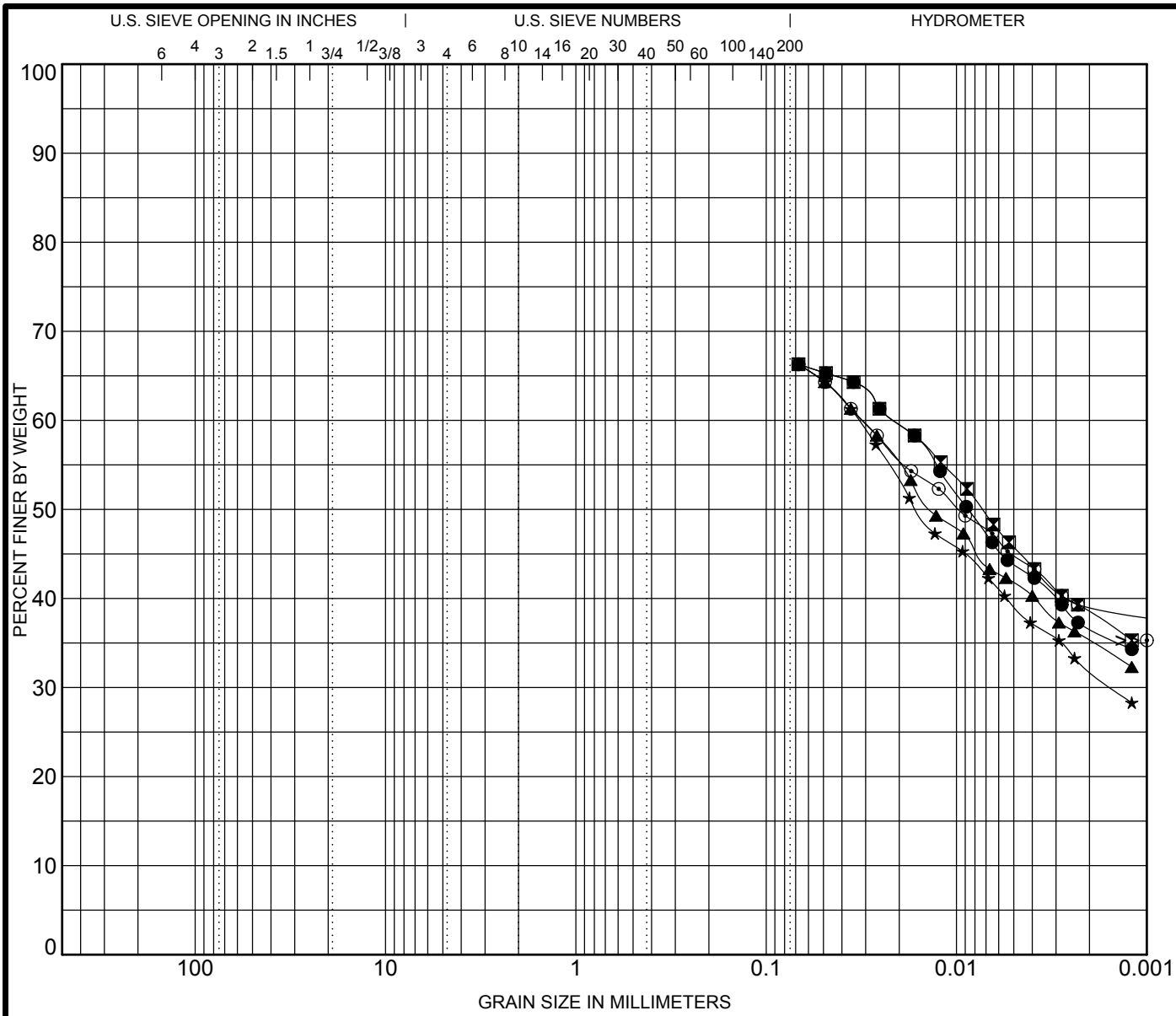

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH14/SA 3	3.35m		53	18	35		
⊠	BH14/SA 4	4.88m		55	20	35		
▲	BH14/SA 5	6.40m		41	15	26		
★	BH14/SA 7	9.45m		43	17	26		
⊙	BH14/SA 9	12.50m		28	13	16		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH14/SA 3	3.35m		0.021						36.7
⊠	BH14/SA 4	4.88m		0.021						38.4
▲	BH14/SA 5	6.40m		0.031						35.2
★	BH14/SA 7	9.45m		0.033	0.002					32.0
⊙	BH14/SA 9	12.50m		0.031						39.1

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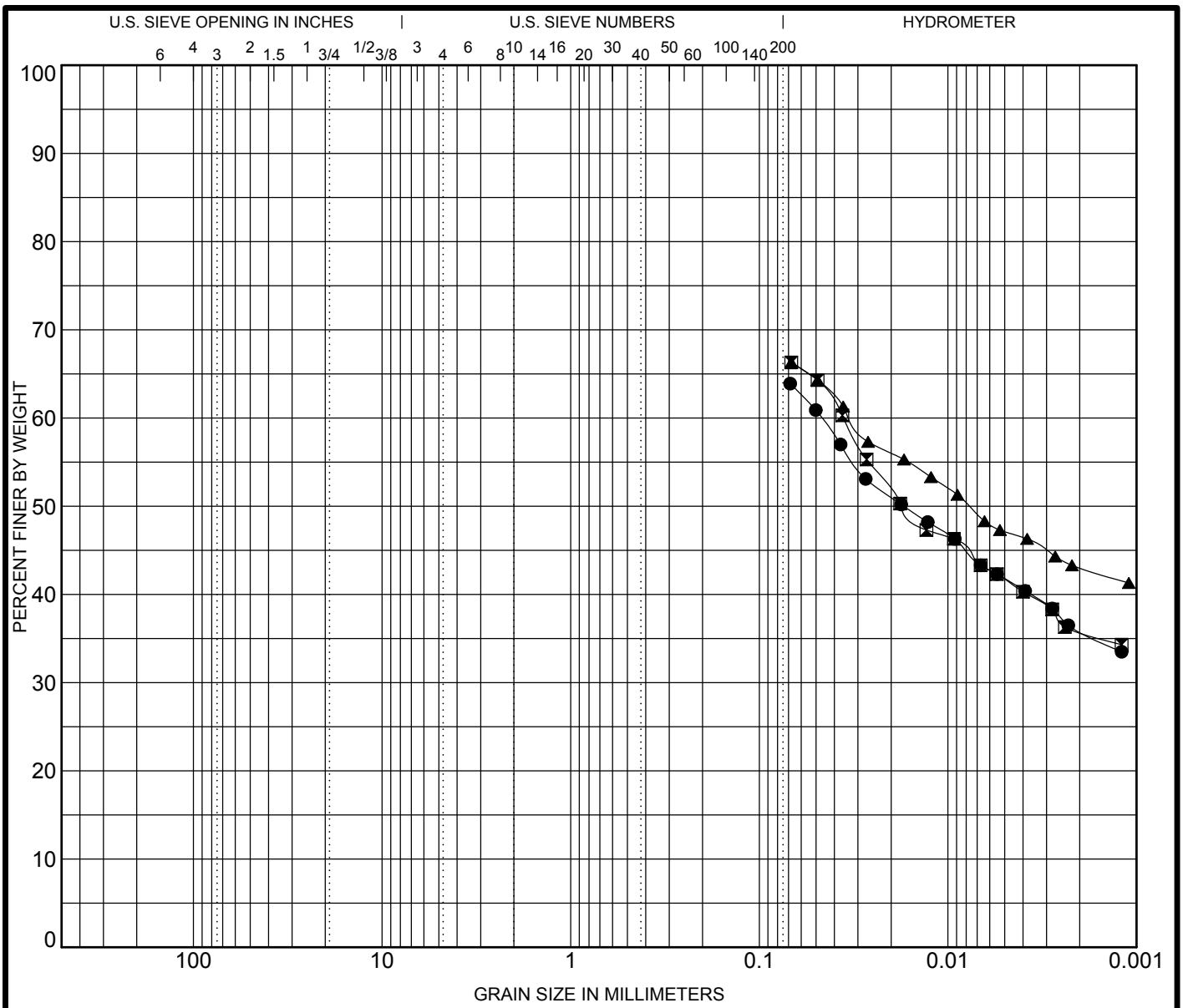

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH14/SA 11 17.07m**		**NP**	**NP**	**NP**		
⊠	**BH14/SA 12 20.12m**		**31**	**11**	**20**		
▲	**BH14/SA 14 26.21m**		**31**	**15**	**16**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH14/SA 11 17.07m**		**0.047**						**35.9**
⊠	**BH14/SA 12 20.12m**		**0.036**						**35.8**
▲	**BH14/SA 14 26.21m**		**0.033**						**43.0**

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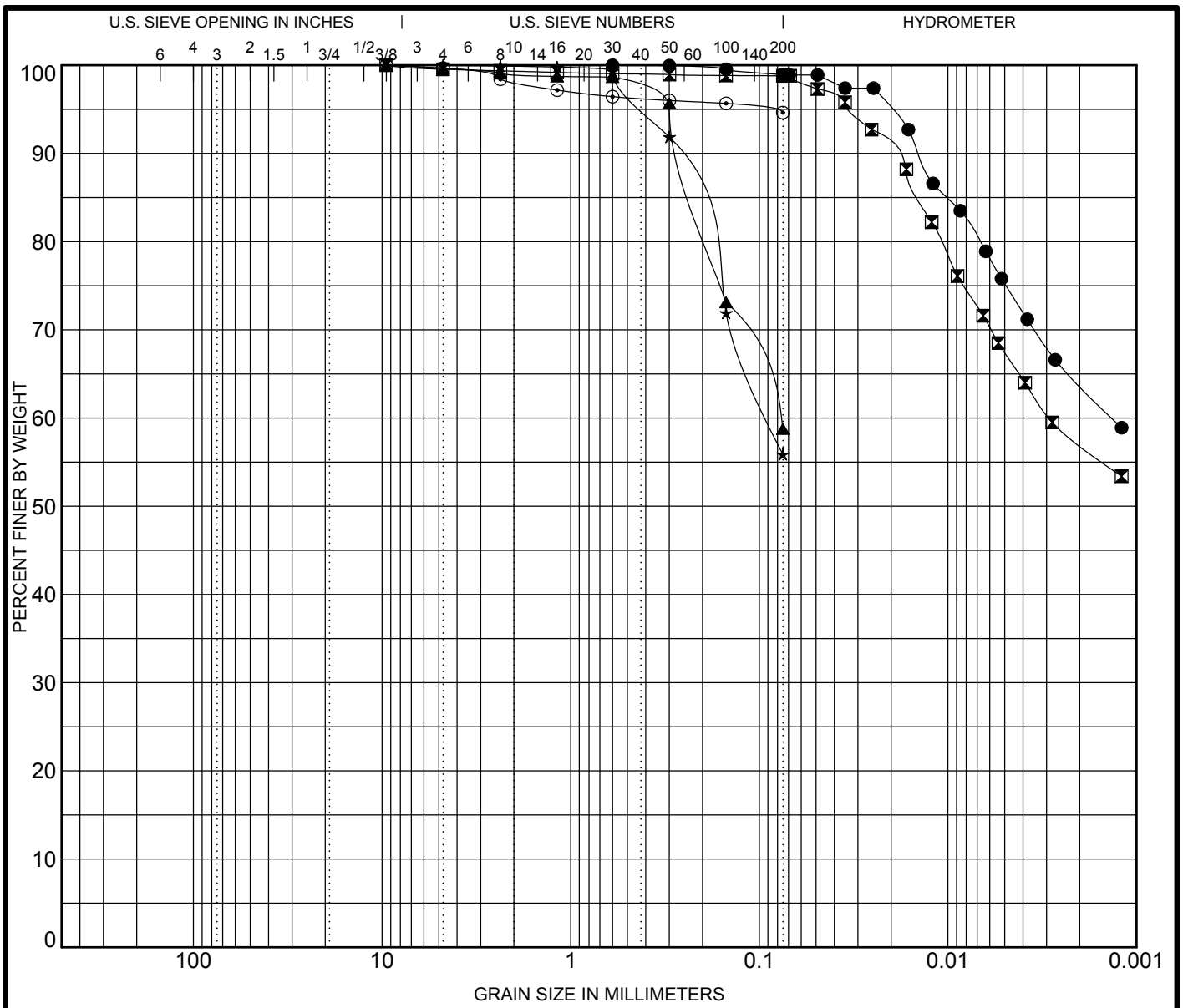
GRAIN SIZE DISTRIBUTION

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

EISL SIEVE 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH15/SA 3	3.35m	FAT CLAY(CH)	58	21	37		
⊠	BH15/SA 7	9.45m	FAT CLAY(CH)	57	22	35		
▲	BH15/SA 11	17.07m	SANDY LEAN CLAY(CI)	32	12	20		
★	BH15/SA 12	20.12m	SANDY LEAN CLAY(CI)	31	13	18		
⊙	BH15/SA 14	26.21m	FAT CLAY(CH)	59	21	38		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH15/SA 3	3.35m	0.6	0.001			0.0	1.1	35.2	63.8
⊠	BH15/SA 7	9.45m	9.5	0.003			0.5	0.7	41.7	57.1
▲	BH15/SA 11	17.07m	9.5	0.08			0.3	40.9	58.8	
★	BH15/SA 12	20.12m	4.75	0.09			0.0	44.1	55.9	
⊙	BH15/SA 14	26.21m	9.5				0.3	5.0	94.6	

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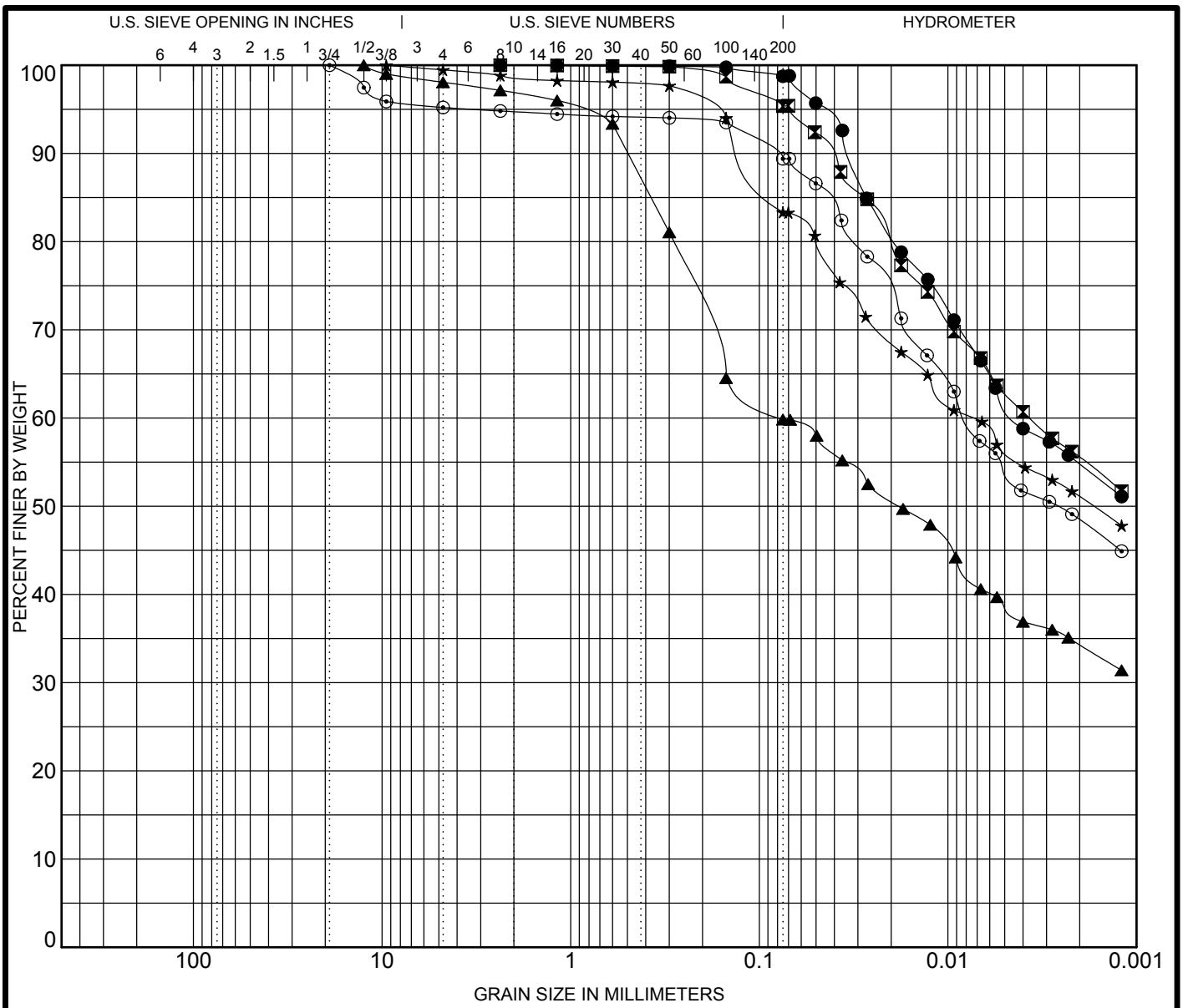
GRAIN SIZE DISTRIBUTION

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

EISL SIEVE 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH16/SA 3	3.35m	FAT CLAY(CH)	55	20	35		
⊠	BH16/SA 5	6.40m	FAT CLAY(CH)	52	17	35		
▲	BH16/SA 7	9.45m	SANDY LEAN CLAY(CI)	34	11	23		
★	BH16/SA 8	10.97m	LEAN CLAY with SAND(CI)	38	15	23		
⊙	BH16/SA 9	12.50m	LEAN CLAY(CI)	48	17	31		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH16/SA 3	3.35m	2.36	0.004			0.0	1.3	44.0	54.8
⊠	BH16/SA 5	6.40m	2.36	0.004			0.0	4.6	39.9	55.5
▲	BH16/SA 7	9.45m	12.5	0.077			1.9	38.2	25.5	34.3
★	BH16/SA 8	10.97m	9.5	0.007			0.5	16.1	32.3	51.1
⊙	BH16/SA 9	12.50m	19	0.008			4.8	5.8	41.0	48.4

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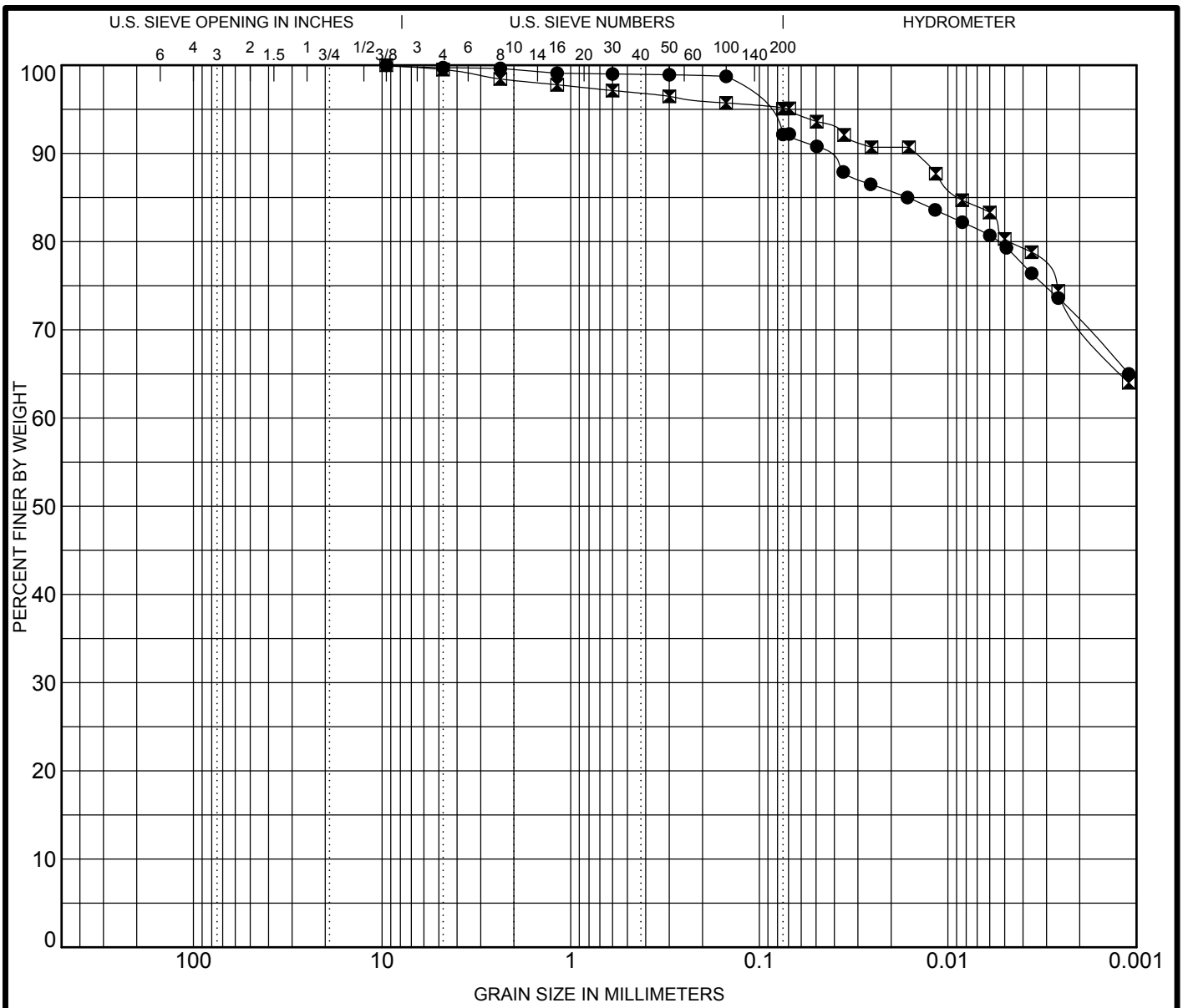
GRAIN SIZE DISTRIBUTION

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

EISL SIEVE 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**BH16/SA 11 17.07m**	**FAT CLAY(CH)**	**50**	**18**	**32**		
⊠	**BH16/SA 13 23.16m**	**FAT CLAY(CH)**	**73**	**26**	**47**		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH16/SA 11 17.07m**	**9.5**				**0.3**	**7.6**	**21.2**	**71.0**
⊠	**BH16/SA 13 23.16m**	**9.5**				**0.5**	**4.4**	**23.8**	**71.2**

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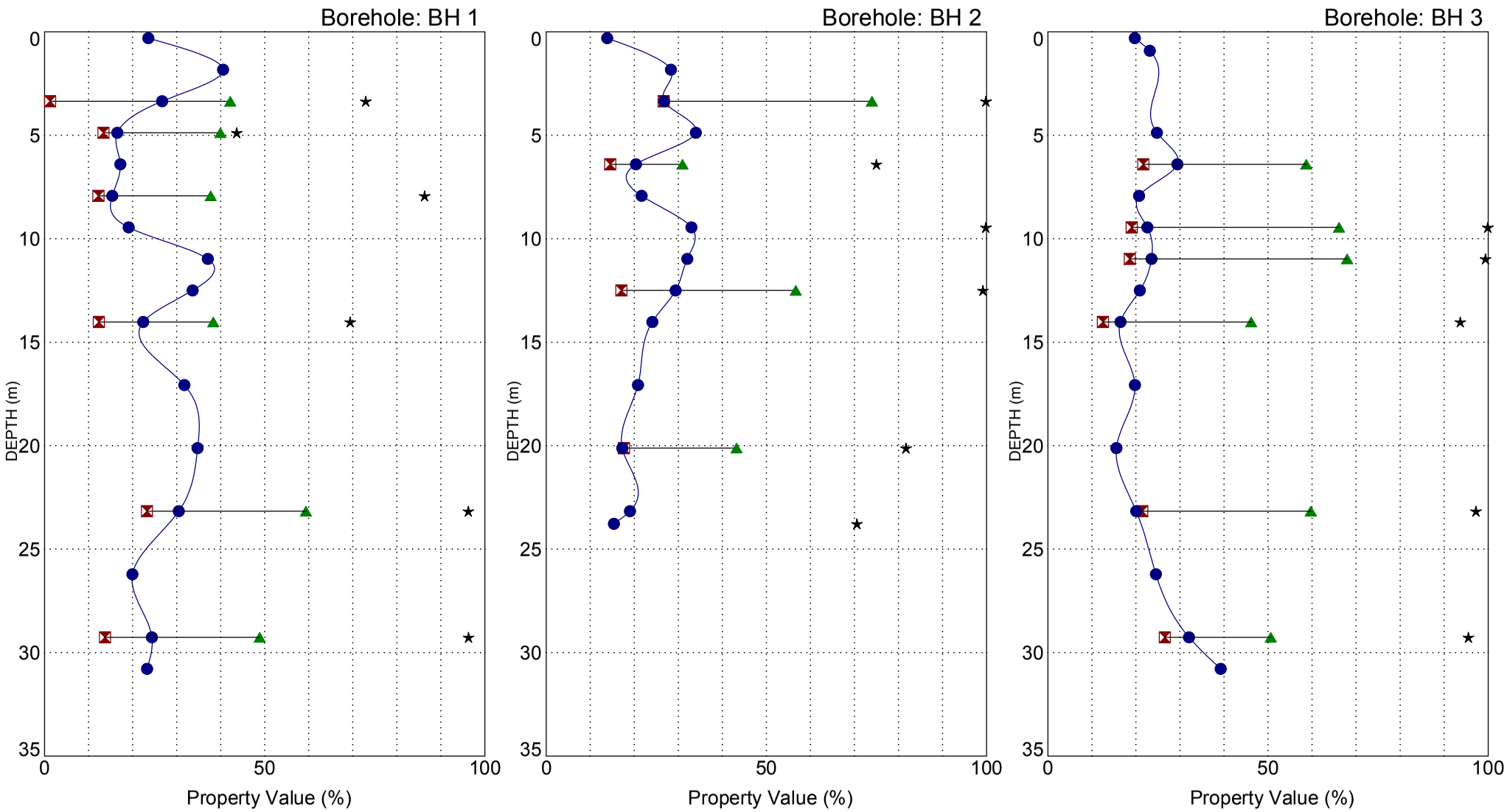

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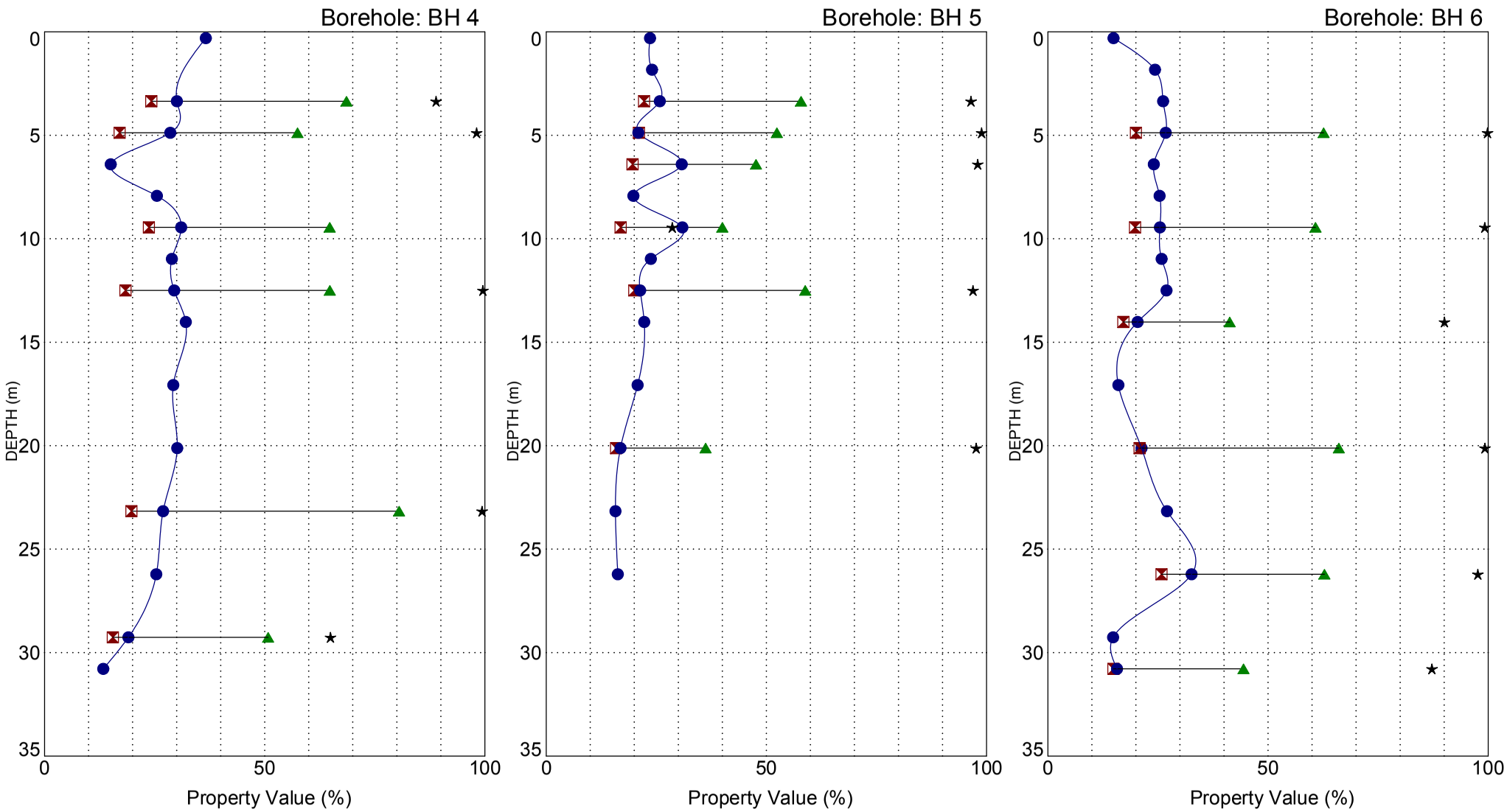
(LEGEND)

Plastic Limit — Water Content — Liquid Limit

★ Fines (Silt & Clay)

PROPERTY VALUE VERSUS DEPTH

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION



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(LEGEND)

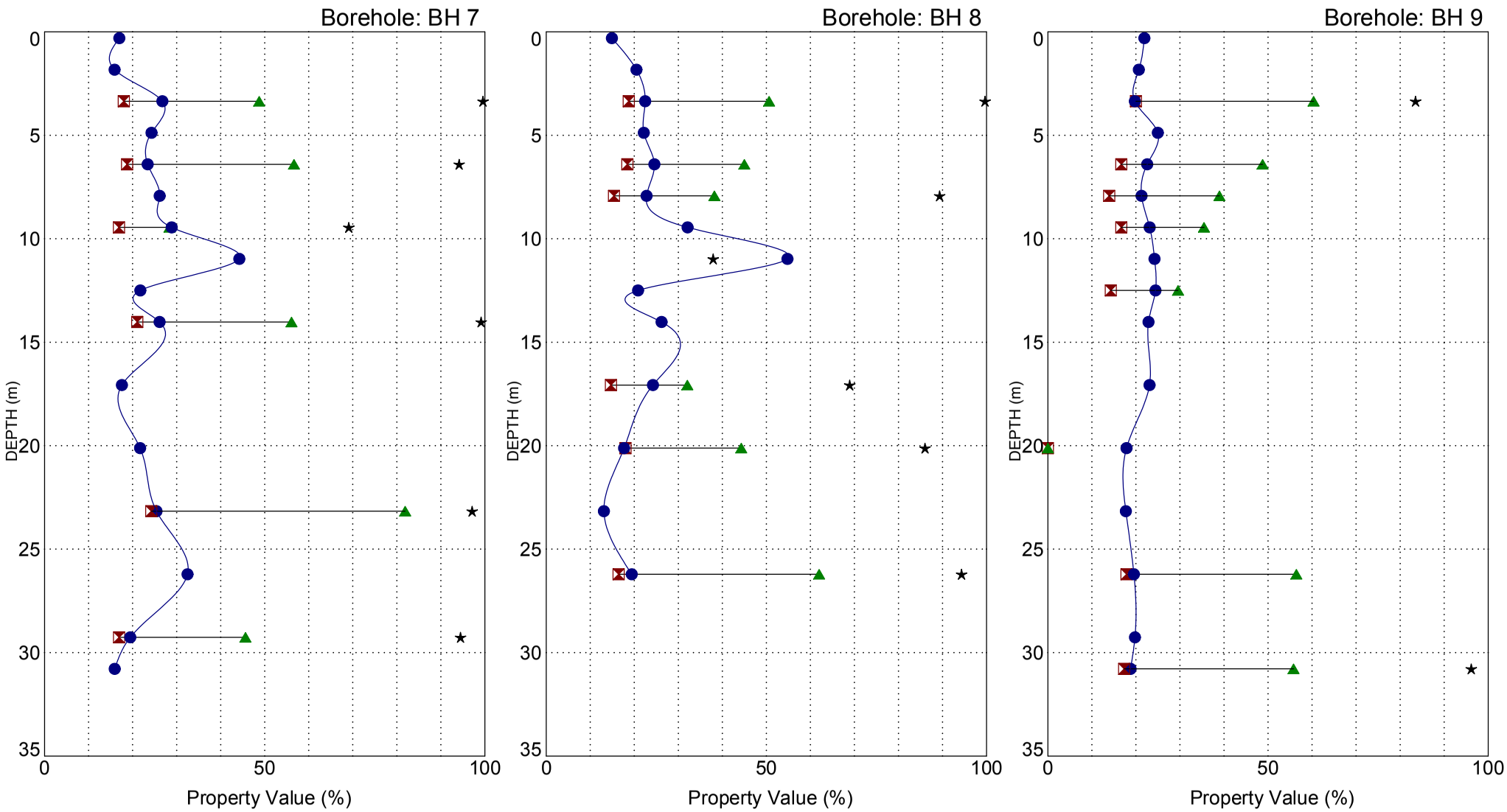
Plastic Limit — Water Content — Liquid Limit

★ Fines (Silt & Clay)

PROPERTY VALUE VERSUS DEPTH

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

PROPERTY VALUE VS. DEPTH 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



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(LEGEND)

Plastic Limit — Water Content — Liquid Limit

★ Fines (Silt & Clay)

PROPERTY VALUE VERSUS DEPTH

Project No.: EISL 0151/1-07
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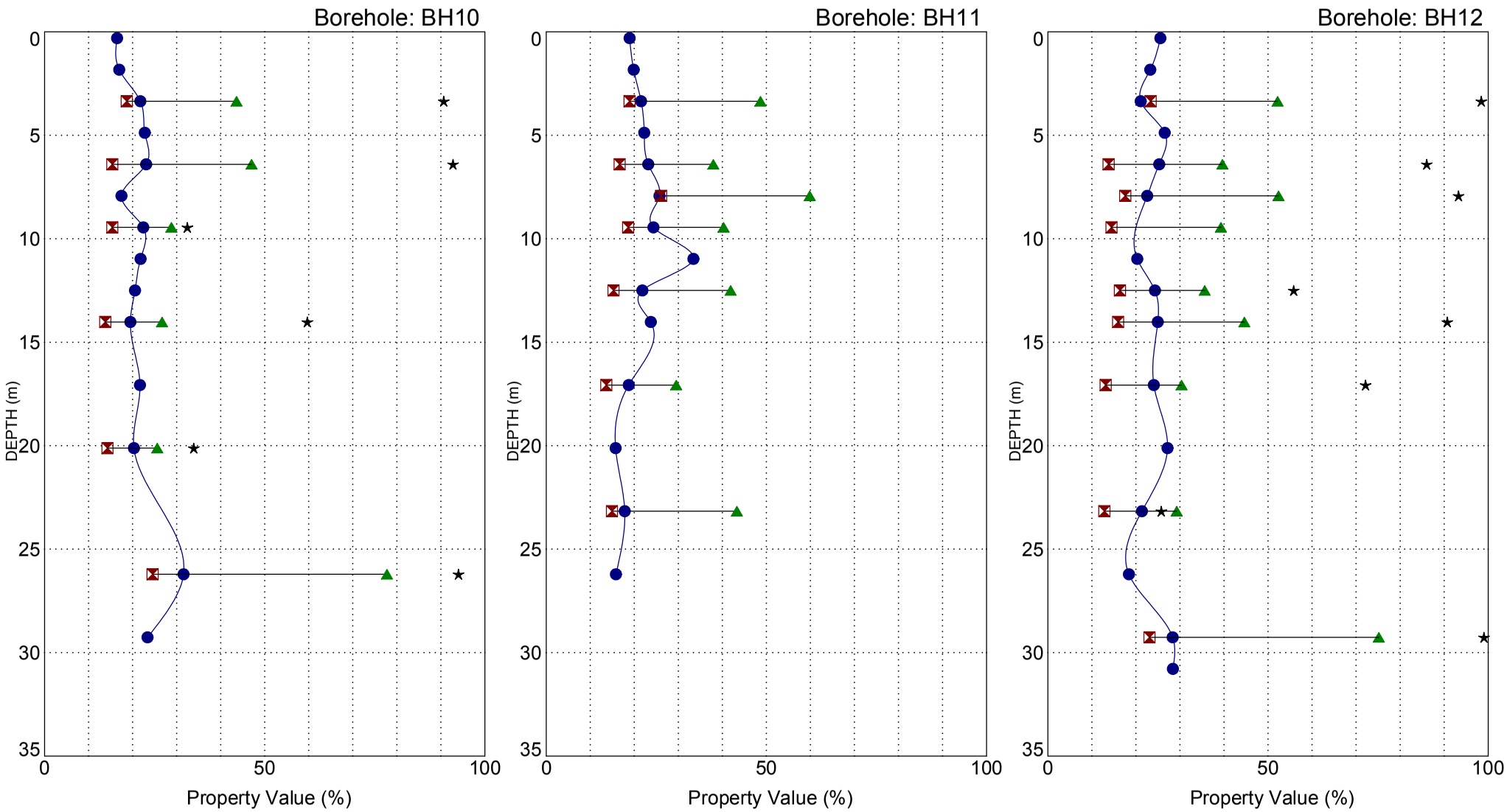
PROPERTY VALUE VS. DEPTH 0151_1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



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(LEGEND)

Plastic Limit — Water Content — Liquid Limit

★ Fines (Silt & Clay)

PROPERTY VALUE VERSUS DEPTH

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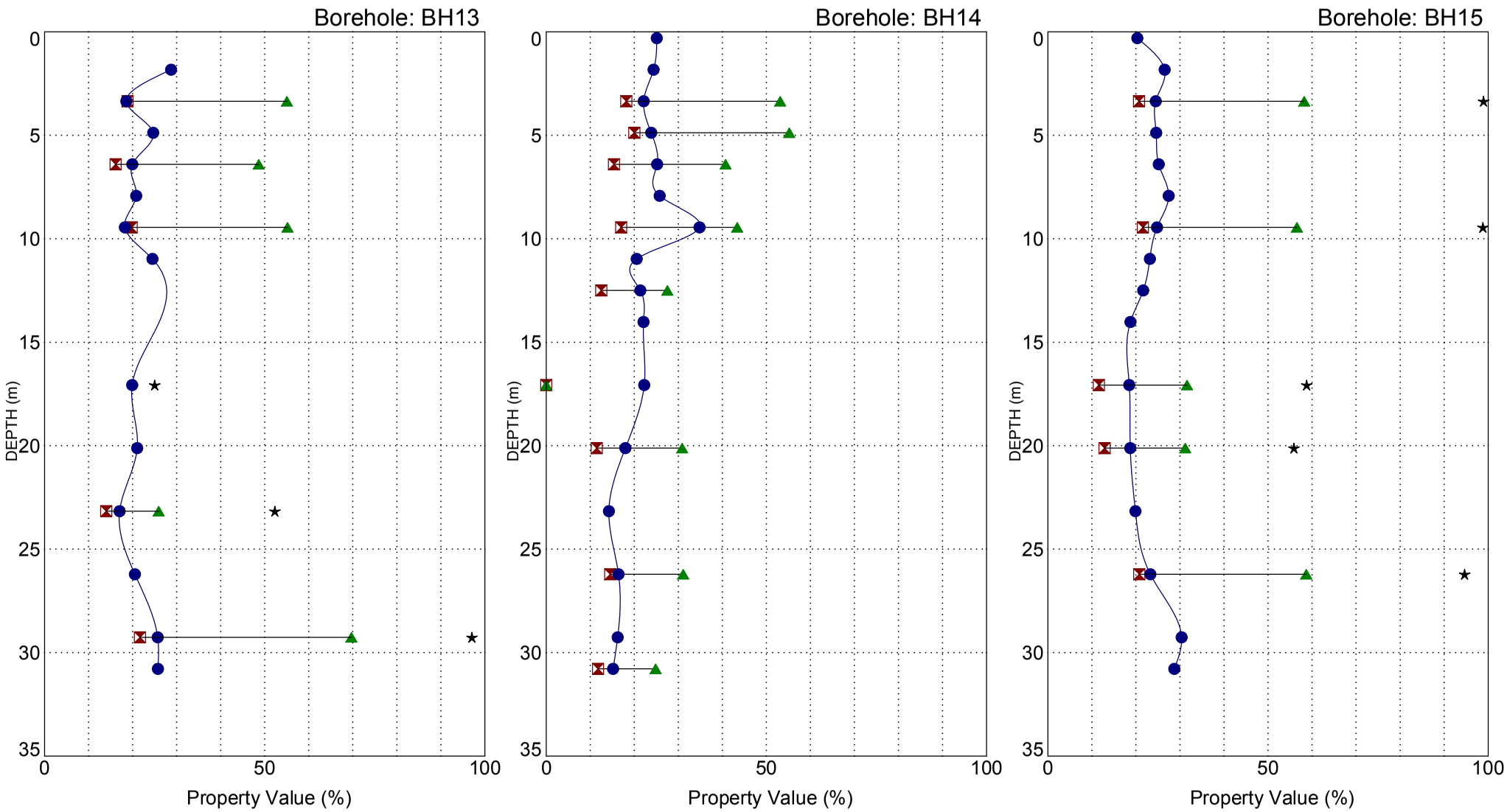

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(LEGEND)

Plastic Limit — Water Content — Liquid Limit

★ Fines (Silt & Clay)

PROPERTY VALUE VERSUS DEPTH

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Client:
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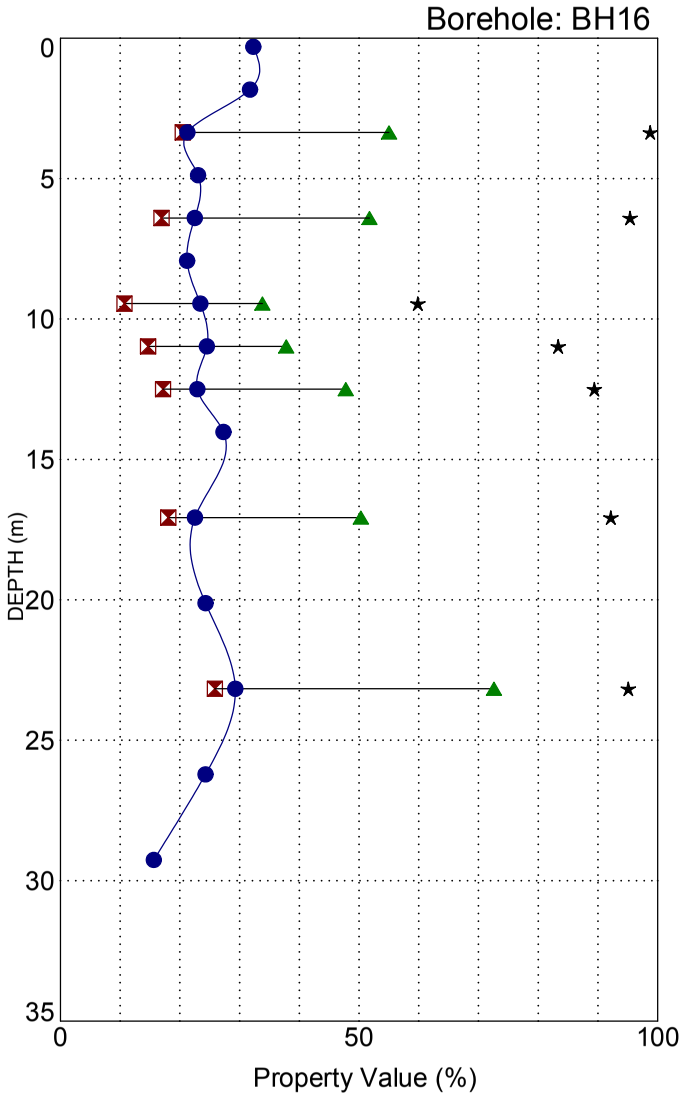

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(LEGEND)

Plastic Limit — Water Content — Liquid Limit

★ Fines (Silt & Clay)

PROPERTY VALUE VERSUS DEPTH

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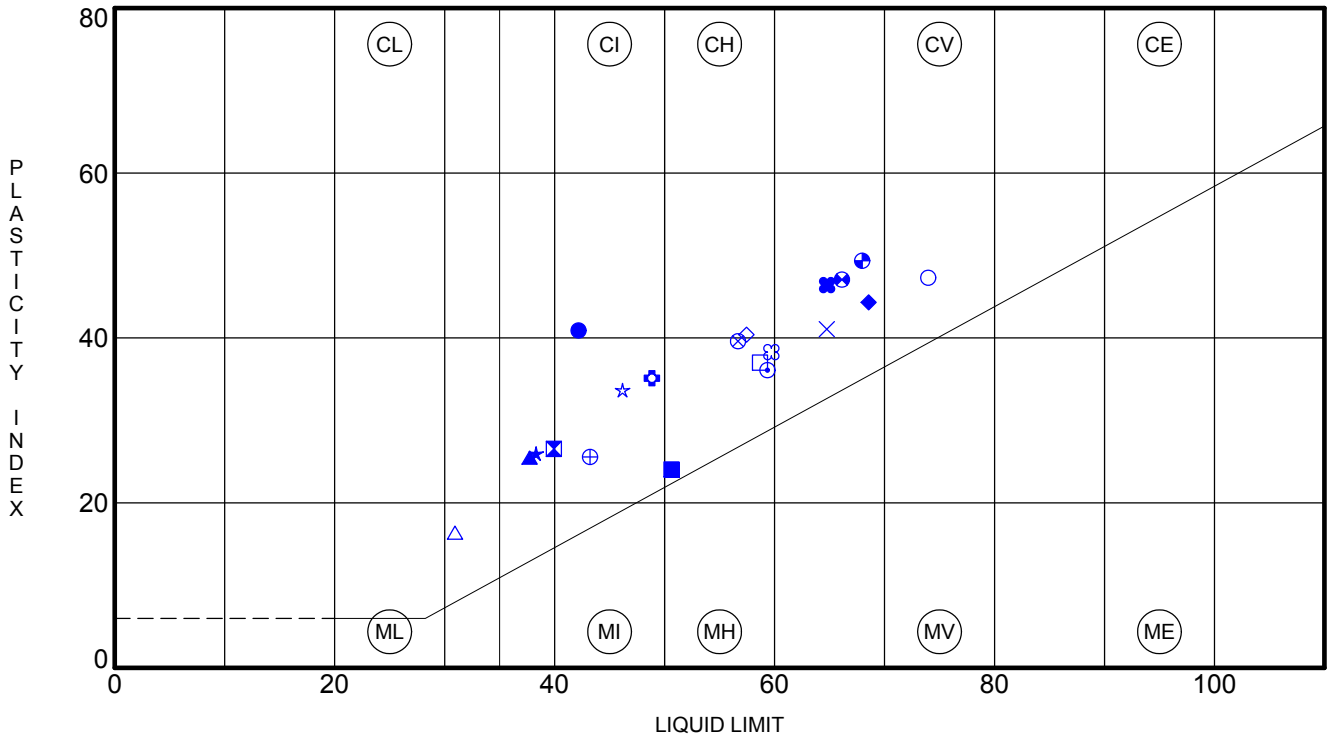

	Specimen Identification		LL	PL	PI	Fines	Classification
●	**BH 1/SA 3**	**3.35m**	**42**	**1**	**41**	**72.9**	**LEAN CLAY with SAND(CI)**
⊠	**BH 1/SA 4**	**4.88m**	**40**	**13**	**27**	**43.6**	**CLAYEY SAND(SC)**
▲	**BH 1/SA 6**	**7.92m**	**38**	**12**	**26**	**86.3**	**LEAN CLAY(CI)**
★	**BH 1/SA 10**	**14.02m**	**38**	**12**	**26**	**69.4**	**SANDY LEAN CLAY(CI)**
⊙	**BH 1/SA 13**	**23.16m**	**59**	**23**	**36**	**96.2**	**FAT CLAY(CH)**
✿	**BH 1/SA 15**	**29.26m**	**49**	**14**	**35**	**96.3**	**LEAN CLAY(CI)**
○	**BH 2/SA 3**	**3.35m**	**74**	**27**	**47**	**99.8**	**FAT CLAY(CH)**
△	**BH 2/SA 5**	**6.40m**	**31**	**15**	**16**	**75.0**	**LEAN CLAY with SAND(CI)**
⊗	**BH 2/SA 9**	**12.50m**	**57**	**17**	**40**	**99.2**	**FAT CLAY(CH)**
⊕	**BH 2/SA 12**	**20.12m**	**43**	**18**	**25**	**81.7**	**LEAN CLAY with SAND(CI)**
□	**BH 3/SA 5**	**6.40m**	**59**	**22**	**37**		
⊗	**BH 3/SA 7**	**9.45m**	**66**	**19**	**47**	**99.9**	**FAT CLAY(CH)**
◕	**BH 3/SA 8**	**10.97m**	**68**	**19**	**49**	**99.4**	**FAT CLAY(CH)**
☆	**BH 3/SA 10**	**14.02m**	**46**	**13**	**34**	**93.7**	**LEAN CLAY(CI)**
✿	**BH 3/SA 13**	**23.16m**	**60**	**21**	**39**	**97.2**	**FAT CLAY(CH)**
■	**BH 3/SA 15**	**29.26m**	**51**	**27**	**24**	**95.5**	**FAT CLAY(CH)**
◆	**BH 4/SA 3**	**3.35m**	**69**	**24**	**45**	**88.9**	**FAT CLAY(CH)**
◇	**BH 4/SA 4**	**4.88m**	**57**	**17**	**40**	**98.1**	**FAT CLAY(CH)**
×	**BH 4/SA 7**	**9.45m**	**65**	**24**	**41**		
✖	**BH 4/SA 9**	**12.50m**	**65**	**18**	**47**	**99.5**	**FAT CLAY(CH)**

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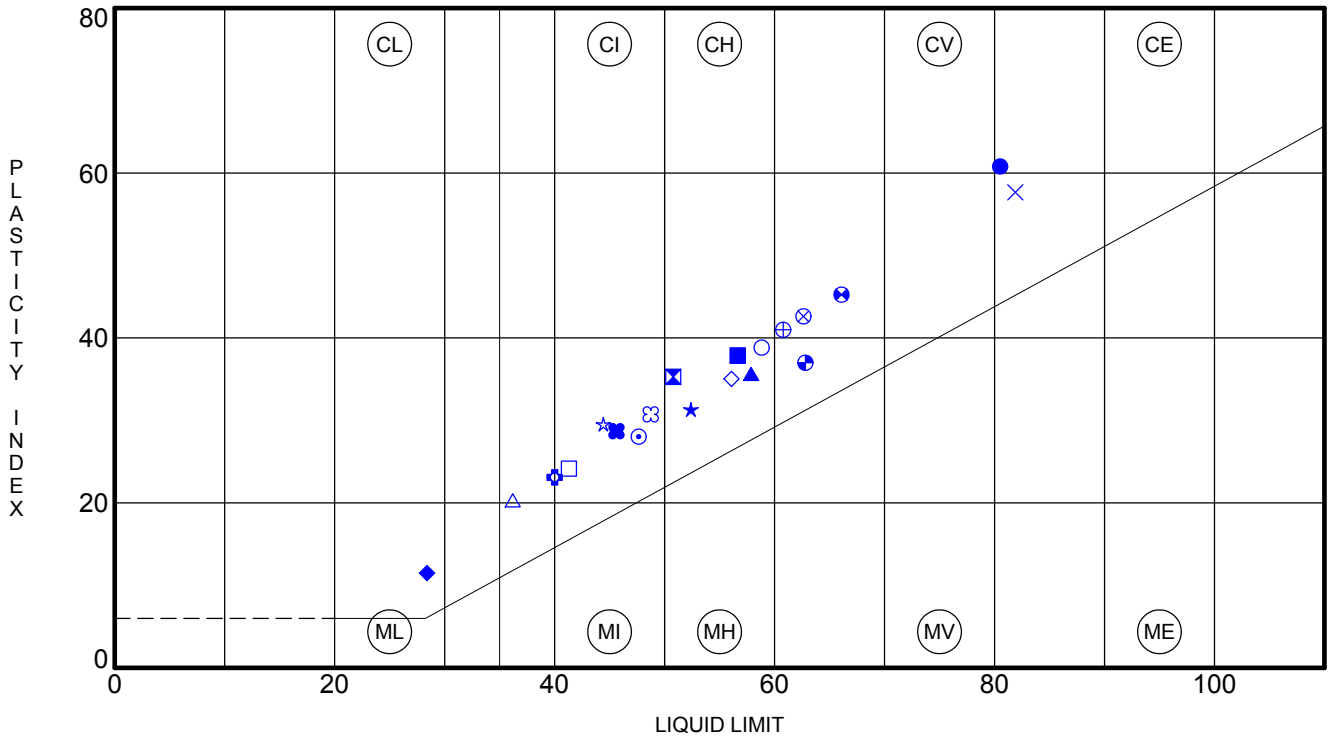
ATTERBERG LIMITS' RESULTS

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Location: Point Lisas
Client:
Type: SITE INVESTIGATION

EISL ATTERBERG LIMITS 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



Specimen Identification			LL	PL	PI	Fines	Classification
●	BH 4/SA 13	23.16m	81	20	61	99.3	FAT CLAY(CH)
⊠	BH 4/SA 15	29.26m	51	16	35	64.9	SANDY FAT CLAY(CH)
▲	BH 5/SA 3	3.35m	58	22	36	96.5	FAT CLAY(CH)
★	BH 5/SA 4	4.88m	52	21	31	98.9	FAT CLAY(CH)
⊙	BH 5/SA 5	6.40m	48	20	28	98.0	LEAN CLAY(CI)
✿	BH 5/SA 7	9.45m	40	17	23	28.6	CLAYEY SAND(SC)
○	BH 5/SA 9	12.50m	59	20	39	96.9	FAT CLAY(CH)
△	BH 5/SA 12	20.12m	36	16	20	97.6	LEAN CLAY(CI)
⊗	BH 6/SA 4	4.88m	63	20	43	99.8	FAT CLAY(CH)
⊕	BH 6/SA 7	9.45m	61	20	41	99.2	FAT CLAY(CH)
□	BH 6/SA 10	14.02m	41	17	24	90.1	LEAN CLAY(CI)
⊗	BH 6/SA 12	20.12m	66	21	45	99.3	FAT CLAY(CH)
◕	BH 6/SA 14	26.21m	63	26	37	97.6	FAT CLAY(CH)
☆	BH 6/SA 16	30.78m	44	15	29	87.2	LEAN CLAY(CI)
✿	BH 7/SA 3	3.35m	49	18	31	99.6	LEAN CLAY(CI)
■	BH 7/SA 5	6.40m	57	19	38	94.1	FAT CLAY(CH)
◆	BH 7/SA 7	9.45m	28	17	11	69.1	SANDY LEAN CLAY(CL)
◇	BH 7/SA 10	14.02m	56	21	35	99.1	FAT CLAY(CH)
×	BH 7/SA 13	23.16m	82	24	58	97.1	FAT CLAY(CH)
✖	BH 7/SA 15	29.26m	46	17	29	94.5	LEAN CLAY(CI)

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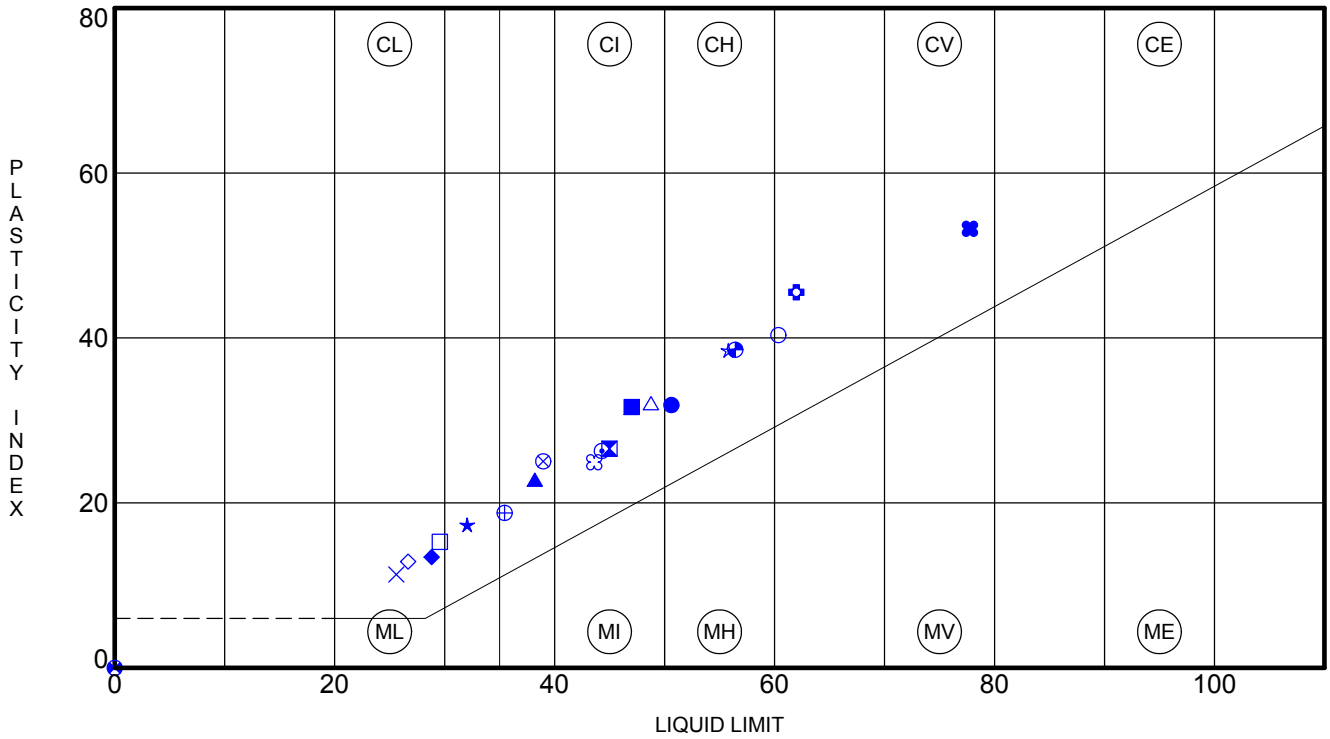
ATTERBERG LIMITS' RESULTS

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Location: Point Lisas
Client:
Type: SITE INVESTIGATION

EISL ATTERBERG LIMITS 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



Specimen Identification			LL	PL	PI	Fines	Classification
●	BH 8/SA 3	3.35m	51	19	32	99.6	FAT CLAY(CH)
⊠	BH 8/SA 5	6.40m	45	18	27		
▲	BH 8/SA 6	7.92m	38	15	23	89.3	LEAN CLAY(CI)
★	BH 8/SA 11	17.07m	32	15	17	68.9	SANDY LEAN CLAY(CI)
⊙	BH 8/SA 12	20.12m	44	18	26	86.0	LEAN CLAY(CI)
✿	BH 8/SA 14	26.21m	62	16	46	94.3	FAT CLAY(CH)
○	BH 9/SA 3	3.35m	60	20	40	83.5	FAT CLAY with SAND(CH)
△	BH 9/SA 5	6.40m	49	17	32		
⊗	BH 9/SA 6	7.92m	39	14	25		
⊕	BH 9/SA 7	9.45m	35	17	18		
□	BH 9/SA 9	12.50m	30	14	16		
⊠	BH 9/SA 12	20.12m	NP	NP	NP		
◕	BH 9/SA 14	26.21m	56	18	38		
☆	BH 9/SA 16	30.78m	56	17	39	96.1	FAT CLAY(CH)
⊗	BH10/SA 3	3.35m	44	19	25	90.6	LEAN CLAY(CI)
■	BH10/SA 5	6.40m	47	15	32	92.8	LEAN CLAY(CI)
◆	BH10/SA 7	9.45m	29	15	14	32.4	CLAYEY SAND(SC)
◇	BH10/SA 10	14.02m	27	14	13	59.7	SANDY LEAN CLAY(CL)
×	BH10/SA 12	20.12m	26	14	12	33.9	CLAYEY SAND(SC)
✖	BH10/SA 14	26.21m	78	25	53	94.0	FAT CLAY(CH)

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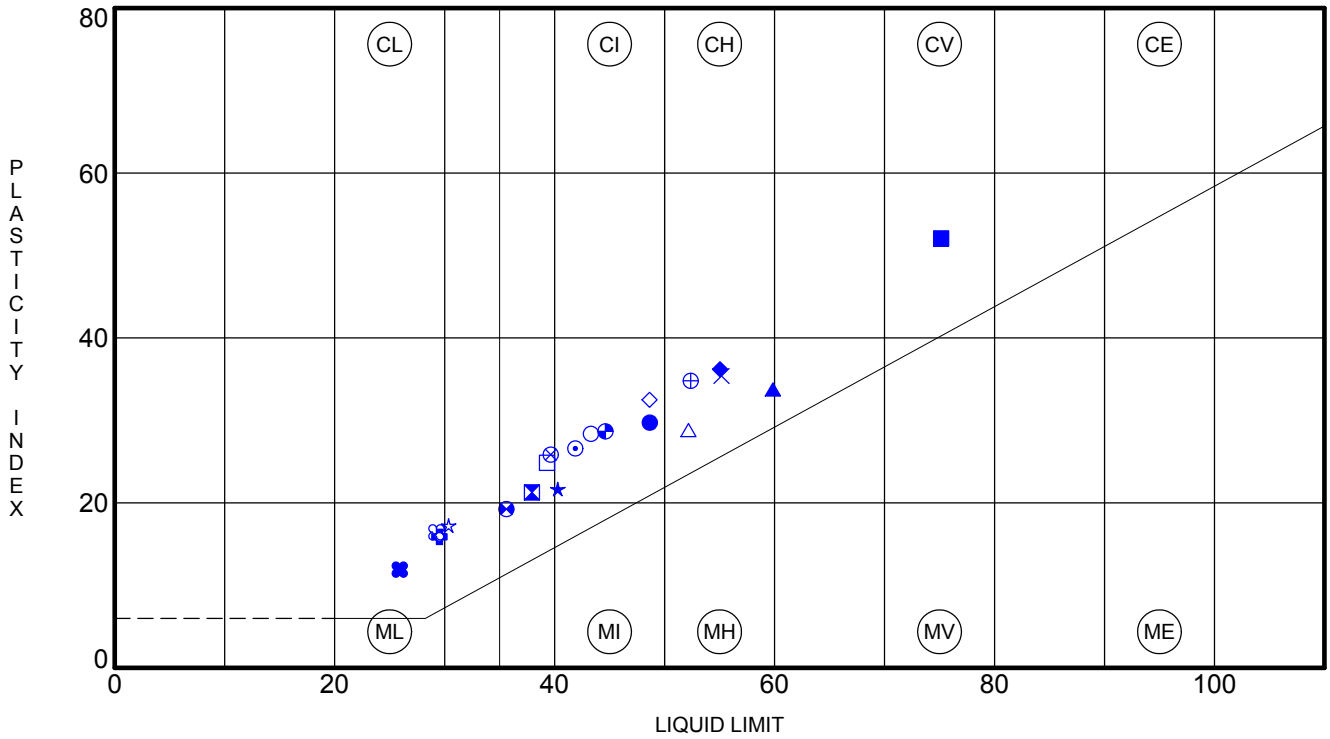
ATTERBERG LIMITS' RESULTS

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Location: Point Lisas
Client:
Type: SITE INVESTIGATION

EISL ATTERBERG LIMITS 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**BH11/SA 3**	**3.35m**	**49**	**19**	**30**		
⊠	**BH11/SA 5**	**6.40m**	**38**	**17**	**21**		
▲	**BH11/SA 6**	**7.92m**	**60**	**26**	**34**		
★	**BH11/SA 7**	**9.45m**	**40**	**19**	**21**		
⊙	**BH11/SA 9**	**12.50m**	**42**	**15**	**27**		
✿	**BH11/SA 11**	**17.07m**	**30**	**14**	**16**		
○	**BH11/SA 13**	**23.16m**	**43**	**15**	**28**		
△	**BH12/SA 3**	**3.35m**	**52**	**23**	**29**	**98.4**	**FAT CLAY(CH)**
⊗	**BH12/SA 6**	**6.40m**	**40**	**14**	**26**	**86.0**	**LEAN CLAY(CI)**
⊕	**BH12/SA 7**	**7.92m**	**52**	**18**	**34**	**93.3**	**FAT CLAY(CH)**
□	**BH12/SA 8**	**9.45m**	**39**	**14**	**25**		
⊗	**BH12/SA 10**	**12.50m**	**36**	**16**	**20**	**55.8**	**SANDY LEAN CLAY(CI)**
◕	**BH12/SA 11**	**14.02m**	**45**	**16**	**29**	**90.7**	**LEAN CLAY(CI)**
☆	**BH12/SA 12**	**17.07m**	**30**	**13**	**17**	**72.1**	**LEAN CLAY with SAND(CI)**
✿	**BH12/SA 14**	**23.16m**	**29**	**13**	**16**	**25.8**	**CLAYEY SAND(SC)**
■	**BH12/SA 16**	**29.26m**	**75**	**23**	**52**	**99.0**	**FAT CLAY(CH)**
◆	**BH13/SA 3**	**3.35m**	**55**	**19**	**36**		
◇	**BH13/SA 5**	**6.40m**	**49**	**16**	**33**		
×	**BH13/SA 7**	**9.45m**	**55**	**20**	**35**		
✖	**BH13/SA 13**	**23.16m**	**26**	**14**	**12**	**52.3**	**SANDY LEAN CLAY(CL)**

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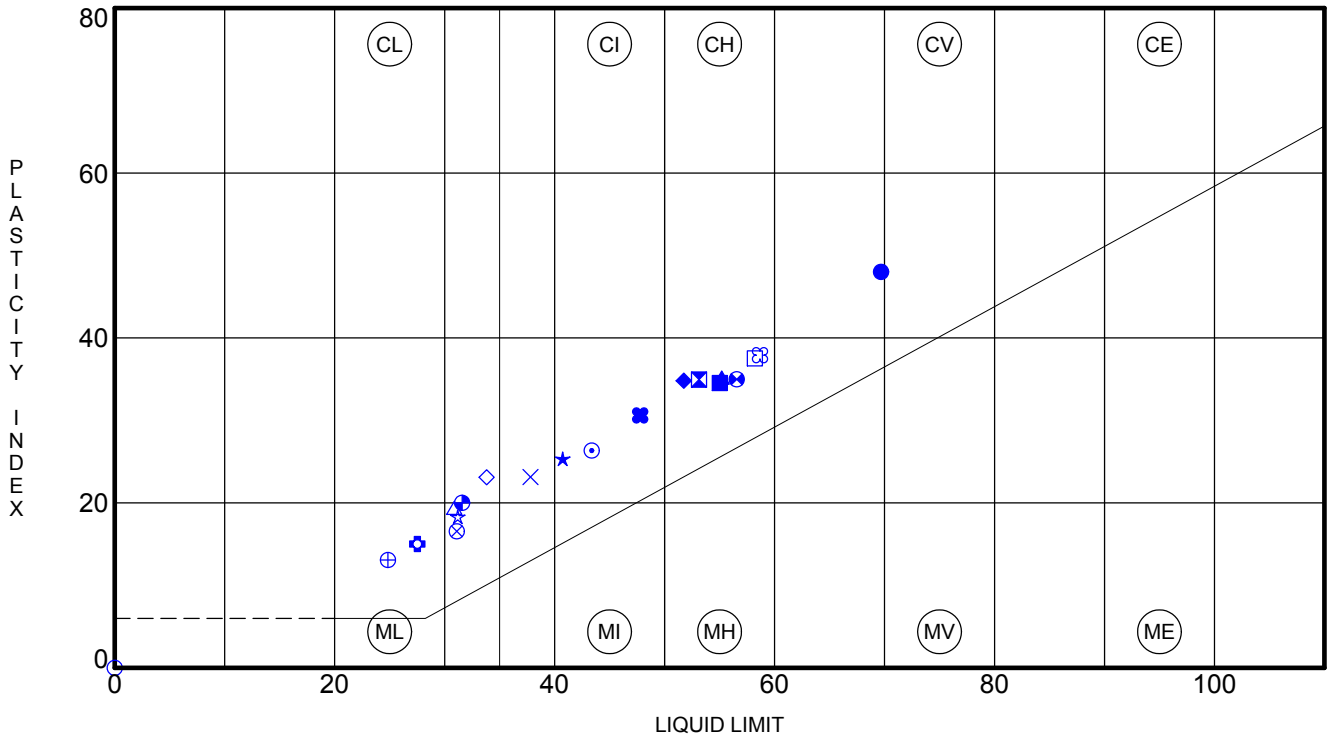
ATTERBERG LIMITS' RESULTS

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Location: Point Lisas
Client:
Type: SITE INVESTIGATION

EISL ATTERBERG LIMITS 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



Specimen Identification			LL	PL	PI	Fines	Classification
●	**BH13/SA 15**	**29.26m**	**70**	**22**	**48**	**97.0**	**FAT CLAY(CH)**
⧗	**BH14/SA 3**	**3.35m**	**53**	**18**	**35**		
▲	**BH14/SA 4**	**4.88m**	**55**	**20**	**35**		
★	**BH14/SA 5**	**6.40m**	**41**	**15**	**26**		
⊙	**BH14/SA 7**	**9.45m**	**43**	**17**	**26**		
✿	**BH14/SA 9**	**12.50m**	**28**	**13**	**16**		
○	**BH14/SA 11**	**17.07m**	**NP**	**NP**	**NP**		
△	**BH14/SA 12**	**20.12m**	**31**	**11**	**20**		
⊗	**BH14/SA 14**	**26.21m**	**31**	**15**	**16**		
⊕	**BH14/SA 16**	**30.78m**	**25**	**12**	**13**		
□	**BH15/SA 3**	**3.35m**	**58**	**21**	**37**	**98.9**	**FAT CLAY(CH)**
⊠	**BH15/SA 7**	**9.45m**	**57**	**22**	**35**	**98.8**	**FAT CLAY(CH)**
◕	**BH15/SA 11**	**17.07m**	**32**	**12**	**20**	**58.8**	**SANDY LEAN CLAY(CI)**
☆	**BH15/SA 12**	**20.12m**	**31**	**13**	**18**	**55.9**	**SANDY LEAN CLAY(CI)**
✿	**BH15/SA 14**	**26.21m**	**59**	**21**	**38**	**94.6**	**FAT CLAY(CH)**
■	**BH16/SA 3**	**3.35m**	**55**	**20**	**35**	**98.8**	**FAT CLAY(CH)**
◆	**BH16/SA 5**	**6.40m**	**52**	**17**	**35**	**95.4**	**FAT CLAY(CH)**
◇	**BH16/SA 7**	**9.45m**	**34**	**11**	**23**	**59.8**	**SANDY LEAN CLAY(CI)**
×	**BH16/SA 8**	**10.97m**	**38**	**15**	**23**	**83.3**	**LEAN CLAY with SAND(CI)**
✖	**BH16/SA 9**	**12.50m**	**48**	**17**	**31**	**89.4**	**LEAN CLAY(CI)**

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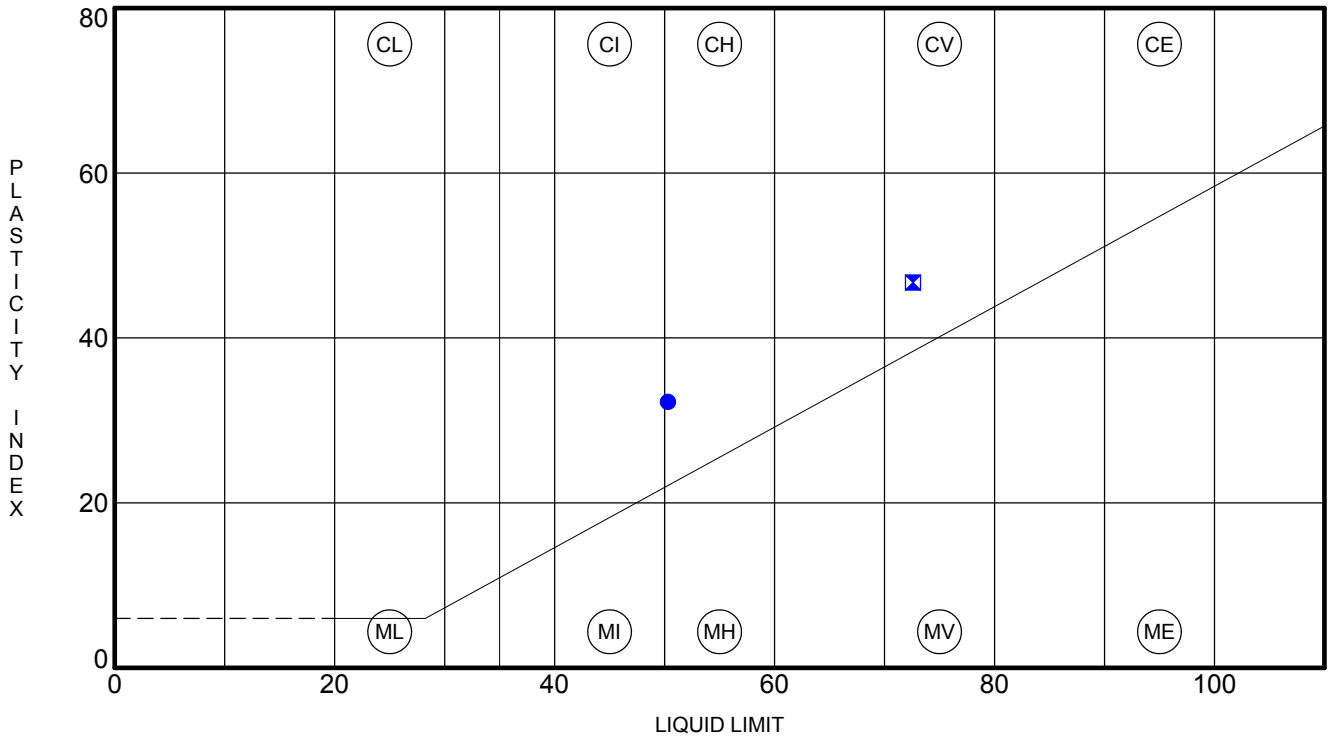
ATTERBERG LIMITS' RESULTS

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Location: Point Lisas
Client:
Type: SITE INVESTIGATION

EISL ATTERBERG LIMITS 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**BH16/SA 11**	**17.07m**	**50**	**18**	**32**	**92.1**	**FAT CLAY(CH)**
⊠	**BH16/SA 13**	**23.16m**	**73**	**26**	**47**	**95.1**	**FAT CLAY(CH)**

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ATTERBERG LIMITS' RESULTS

Project No.: EISL 0151/1-07
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Location: Point Lisas
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EISL ATTERBERG LIMITS 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

Sample ID	Classification	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	% Moisture Content
BH 1 SA 3 *3.35 m*	LEAN CLAY with SAND(CI)	4.4	22.7	30.3	42.7	42	1	41	26.7
BH 1 SA 4 *4.88 m*	CLAYEY SAND(SC)	9.2	47.2	13.0	30.7	40	13	27	16.5
BH 1 SA 6 *7.92 m*	LEAN CLAY(CI)	0.0	13.7	33.4	52.9	38	12	26	15.4
BH 1 SA 10 *14.02 m*	SANDY LEAN CLAY(CI)	0.0	30.6	20.3	49.1	38	12	26	22.4
BH 1 SA 13 *23.16 m*	FAT CLAY(CH)	0.0	3.8	29.9	66.3	59	23	36	30.5
BH 1 SA 15 *29.26 m*	LEAN CLAY(CI)	0.0	3.7	41.3	54.9	49	14	35	24.4
BH 2 SA 2 *1.83 m*					45.6				28.3
BH 2 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	0.2	18.3	81.6	74	27	47	26.8
BH 2 SA 5 *6.40 m*	LEAN CLAY with SAND(CI)	0.9	24.1	41.0	34.0	31	15	16	20.4
BH 2 SA 7 *9.45 m*		0.0	0.2	99.8					33.0
BH 2 SA 9 *12.50 m*	FAT CLAY(CH)	0.0	0.8	99.2		57	17	40	29.4
BH 2 SA 12 *20.12 m*	LEAN CLAY with SAND(CI)	0.0	18.3	81.7		43	18	25	17.3
BH 2 SA 14 *23.77 m*		0.4	29.0	70.6					15.4
BH 3 SA 5 *6.40 m*					48.5	59	22	37	29.4
BH 3 SA 7 *9.45 m*	FAT CLAY(CH)	0.0	0.1	26.8	73.1	66	19	47	22.6
BH 3 SA 8 *10.97 m*	FAT CLAY(CH)	0.0	0.6	99.4		68	19	49	23.5
BH 3 SA 10 *14.02 m*	LEAN CLAY(CI)	0.0	6.3	93.7		46	13	34	16.5
BH 3 SA 13 *23.16 m*	FAT CLAY(CH)	0.0	2.8	97.2		60	21	39	20.1
BH 3 SA 15 *29.26 m*	FAT CLAY(CH)	0.0	4.5	95.5		51	27	24	32.0
BH 4 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	11.1	21.3	67.6	69	24	45	30.0
BH 4 SA 4 *4.88 m*	FAT CLAY(CH)	0.0	1.9	98.1		57	17	40	28.6
BH 4 SA 7 *9.45 m*					49.6	65	24	41	31.0
BH 4 SA 9 *12.50 m*	FAT CLAY(CH)	0.0	0.5	49.2	50.3	65	18	47	29.4
BH 4 SA 13 *23.16 m*	FAT CLAY(CH)	0.0	0.7	43.6	55.7	81	20	61	26.9
BH 4 SA 15 *29.26 m*	SANDY FAT CLAY(CH)	1.3	33.8	64.9		51	16	35	19.0
BH 5 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	3.5	36.3	60.2	58	22	36	25.8
BH 5 SA 4 *4.88 m*	FAT CLAY(CH)	0.1	1.0	37.3	61.6	52	21	31	20.9
BH 5 SA 5 *6.40 m*	LEAN CLAY(CI)	0.0	2.0	48.1	49.8	48	20	28	30.8
BH 5 SA 7 *9.45 m*	CLAYEY SAND(SC)	1.9	69.4	12.7	15.9	40	17	23	30.9
BH 5 SA 9 *12.50 m*	FAT CLAY(CH)	0.5	2.5	26.4	70.5	59	20	39	21.3

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Classification Summary

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

CLASSIFICATION SUMMARY 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

Sample ID	Classification	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	% Moisture Content
BH 5 SA 12 *20.12 m*	LEAN CLAY(CI)	0.0	2.4	48.4	49.2	36	16	20	16.9
BH 6 SA 4 *4.88 m*	FAT CLAY(CH)	0.0	0.2	99.8		63	20	43	26.8
BH 6 SA 7 *9.45 m*	FAT CLAY(CH)	0.0	0.8	37.4	61.8	61	20	41	25.4
BH 6 SA 10 *14.02 m*	LEAN CLAY(CI)	0.0	9.9	90.1		41	17	24	20.4
BH 6 SA 12 *20.12 m*	FAT CLAY(CH)	0.0	0.7	99.3		66	21	45	21.3
BH 6 SA 14 *26.21 m*	FAT CLAY(CH)	0.7	1.7	97.6		63	26	37	32.6
BH 6 SA 16 *30.78 m*	LEAN CLAY(CI)	2.3	10.5	87.2		44	15	29	15.7
BH 7 SA 3 *3.35 m*	LEAN CLAY(CI)	0.0	0.4	47.5	52.1	49	18	31	26.8
BH 7 SA 5 *6.40 m*	FAT CLAY(CH)	0.0	5.9	43.5	50.6	57	19	38	23.4
BH 7 SA 7 *9.45 m*	SANDY LEAN CLAY(CL)	0.1	30.9	35.1	34.0	28	17	11	28.9
BH 7 SA 10 *14.02 m*	FAT CLAY(CH)	0.0	0.9	39.9	59.3	56	21	35	26.1
BH 7 SA 13 *23.16 m*	FAT CLAY(CH)	0.4	2.5	14.3	82.8	82	24	58	25.4
BH 7 SA 15 *29.26 m*	LEAN CLAY(CI)	0.1	5.5	36.2	58.3	46	17	29	19.5
BH 8 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	0.4	38.7	60.9	51	19	32	22.5
BH 8 SA 5 *6.40 m*					33.2	45	18	27	24.6
BH 8 SA 6 *7.92 m*	LEAN CLAY(CI)	0.0	10.7	36.2	53.2	38	15	23	22.8
BH 8 SA 8 *10.97 m*		9.7	52.4	17.6	20.3				54.8
BH 8 SA 11 *17.07 m*	SANDY LEAN CLAY(CI)	3.5	27.6	30.9	38.1	32	15	17	24.2
BH 8 SA 12 *20.12 m*	LEAN CLAY(CI)	5.5	8.5	29.5	56.5	44	18	26	17.7
BH 8 SA 14 *26.21 m*	FAT CLAY(CH)	0.0	5.7	21.8	72.5	62	16	46	19.4
BH 9 SA 3 *3.35 m*	FAT CLAY with SAND(CH)	3.4	13.1	33.8	49.7	60	20	40	19.8
BH 9 SA 5 *6.40 m*					36.4	49	17	32	22.6
BH 9 SA 6 *7.92 m*					39.0	39	14	25	21.3
BH 9 SA 7 *9.45 m*					34.8	35	17	18	23.1
BH 9 SA 9 *12.50 m*					35.8	30	14	16	24.4
BH 9 SA 12 *20.12 m*					31.2	NP	NP	NP	17.9
BH 9 SA 14 *26.21 m*						56	18	38	19.5
BH 9 SA 16 *30.78 m*	FAT CLAY(CH)	0.5	3.4	42.9	53.3	56	17	39	18.8
BH10 SA 3 *3.35 m*	LEAN CLAY(CI)	0.0	9.4	39.9	50.7	44	19	25	21.8
BH10 SA 5 *6.40 m*	LEAN CLAY(CI)	0.1	7.1	39.8	53.0	47	15	32	23.1

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Classification Summary

Project No.: EISL 0151/1-07
Project: CARISAL - Calcium Carbide Plant
Client:
Location: Point Lisas
Type: SITE INVESTIGATION

Sample ID	Classification	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	% Moisture Content
BH10 SA 7 *9.45 m*	CLAYEY SAND(SC)	0.0	67.6	32.4		29	15	14	22.4
BH10 SA 10 *14.02 m*	SANDY LEAN CLAY(CL)	0.2	40.1	24.7	35.0	27	14	13	19.5
BH10 SA 12 *20.12 m*	CLAYEY SAND(SC)	7.8	58.3	16.9	17.0	26	14	12	20.3
BH10 SA 14 *26.21 m*	FAT CLAY(CH)	2.6	3.4	15.9	78.1	78	25	53	31.6
BH11 SA 3 *3.35 m*					35.5	49	19	30	21.5
BH11 SA 5 *6.40 m*					32.5	38	17	21	23.2
BH11 SA 6 *7.92 m*					41.7	60	26	34	25.7
BH11 SA 7 *9.45 m*					31.5	40	19	21	24.3
BH11 SA 9 *12.50 m*						42	15	27	21.8
BH11 SA 11 *17.07 m*					34.8	30	14	16	18.7
BH11 SA 13 *23.16 m*						43	15	28	17.8
BH12 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	1.6	41.7	56.8	52	23	29	21.1
BH12 SA 6 *6.40 m*	LEAN CLAY(CI)	0.4	13.6	39.7	46.3	40	14	26	25.3
BH12 SA 7 *7.92 m*	FAT CLAY(CH)	0.0	6.7	40.4	52.9	52	18	34	22.6
BH12 SA 8 *9.45 m*						39	14	25	
BH12 SA 10 *12.50 m*	SANDY LEAN CLAY(CI)	0.9	43.3	25.7	30.1	36	16	20	24.3
BH12 SA 11 *14.02 m*	LEAN CLAY(CI)	3.7	5.6	43.7	47.0	45	16	29	25.0
BH12 SA 12 *17.07 m*	LEAN CLAY with SAND(CI)	0.1	27.8	32.2	39.9	30	13	17	24.1
BH12 SA 14 *23.16 m*	CLAYEY SAND(SC)	0.2	74.1	25.8		29	13	16	21.4
BH12 SA 16 *29.26 m*	FAT CLAY(CH)	0.0	1.0	20.3	78.7	75	23	52	28.3
BH13 SA 3 *3.35 m*					34.5	55	19	36	18.6
BH13 SA 5 *6.40 m*					35.8	49	16	33	19.9
BH13 SA 7 *9.45 m*					35.2	55	20	35	18.2
BH13 SA 11 *17.07 m*		8.7	66.3	12.8	12.2				19.9
BH13 SA 13 *23.16 m*	SANDY LEAN CLAY(CL)	0.0	47.7	18.2	34.1	26	14	12	17.0
BH13 SA 15 *29.26 m*	FAT CLAY(CH)	0.0	3.0	16.9	80.2	70	22	48	25.7
BH14 SA 3 *3.35 m*					36.7	53	18	35	22.1
BH14 SA 4 *4.88 m*					38.4	55	20	35	23.8
BH14 SA 5 *6.40 m*					35.2	41	15	26	25.2
BH14 SA 7 *9.45 m*					32.0	43	17	26	34.8

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Sample ID	Classification	% Gravel	% Sand	% Silt	% Clay	LL	PL	PI	% Moisture Content
BH14 SA 9 *12.50 m*					39.1	28	13	16	21.4
BH14 SA 11 *17.07 m*					35.9	NP	NP	NP	22.3
BH14 SA 12 *20.12 m*					35.8	31	11	20	18.0
BH14 SA 14 *26.21 m*					43.0	31	15	16	16.4
BH14 SA 16 *30.78 m*						25	12	13	15.2
BH15 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	1.1	35.2	63.8	58	21	37	24.5
BH15 SA 7 *9.45 m*	FAT CLAY(CH)	0.5	0.7	41.7	57.1	57	22	35	24.8
BH15 SA 11 *17.07 m*	SANDY LEAN CLAY(CI)	0.3	40.9	58.8		32	12	20	18.5
BH15 SA 12 *20.12 m*	SANDY LEAN CLAY(CI)	0.0	44.1	55.9		31	13	18	18.7
BH15 SA 14 *26.21 m*	FAT CLAY(CH)	0.3	5.0	94.6		59	21	38	23.3
BH16 SA 3 *3.35 m*	FAT CLAY(CH)	0.0	1.3	44.0	54.8	55	20	35	21.3
BH16 SA 5 *6.40 m*	FAT CLAY(CH)	0.0	4.6	39.9	55.5	52	17	35	22.5
BH16 SA 7 *9.45 m*	SANDY LEAN CLAY(CI)	1.9	38.2	25.5	34.3	34	11	23	23.4
BH16 SA 8 *10.97 m*	LEAN CLAY with SAND(CI)	0.5	16.1	32.3	51.1	38	15	23	24.5
BH16 SA 9 *12.50 m*	LEAN CLAY(CI)	4.8	5.8	41.0	48.4	48	17	31	22.9
BH16 SA 11 *17.07 m*	FAT CLAY(CH)	0.3	7.6	21.2	71.0	50	18	32	22.5
BH16 SA 13 *23.16 m*	FAT CLAY(CH)	0.5	4.4	23.8	71.2	73	26	47	29.3

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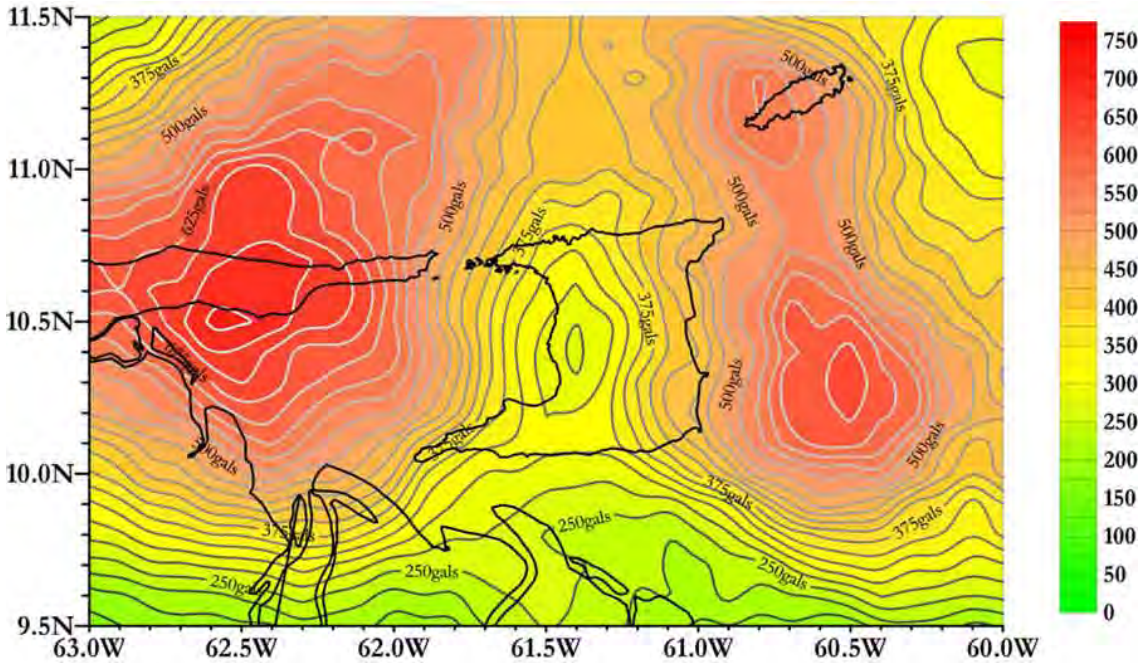
CLASSIFICATION SUMMARY 0151 1-07 CARISAL POINT LISAS.GPJ EISL.GDT 12/7/07

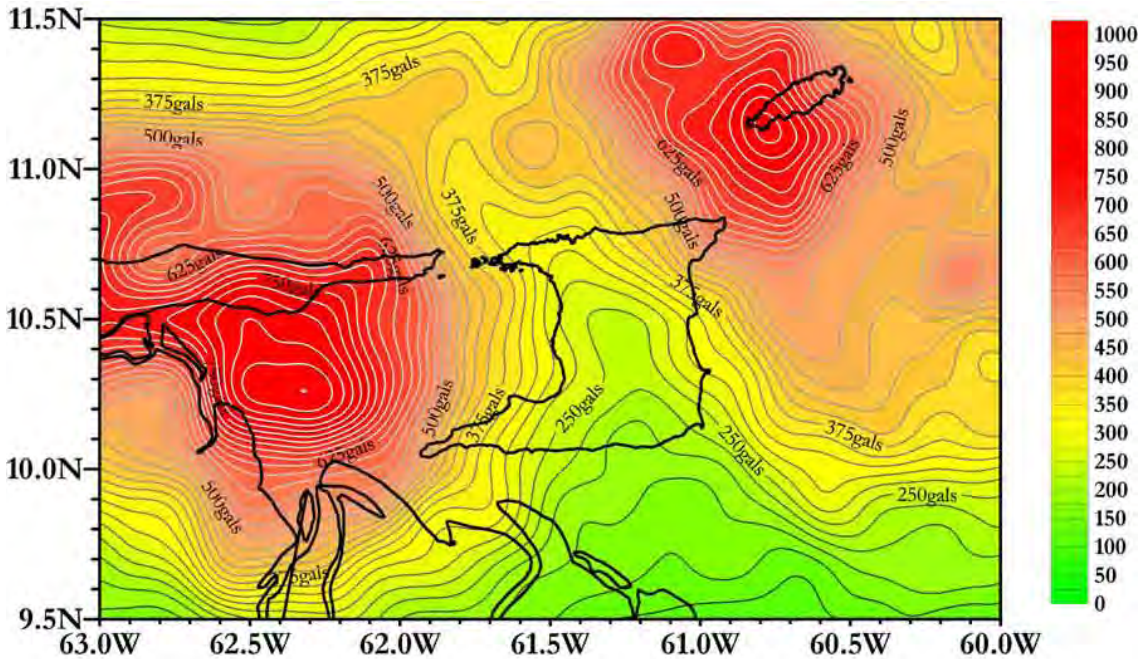
APPENDIX D

SPECTRAL GROUND ACCELERATIONS

http://www.uwiseismic.com



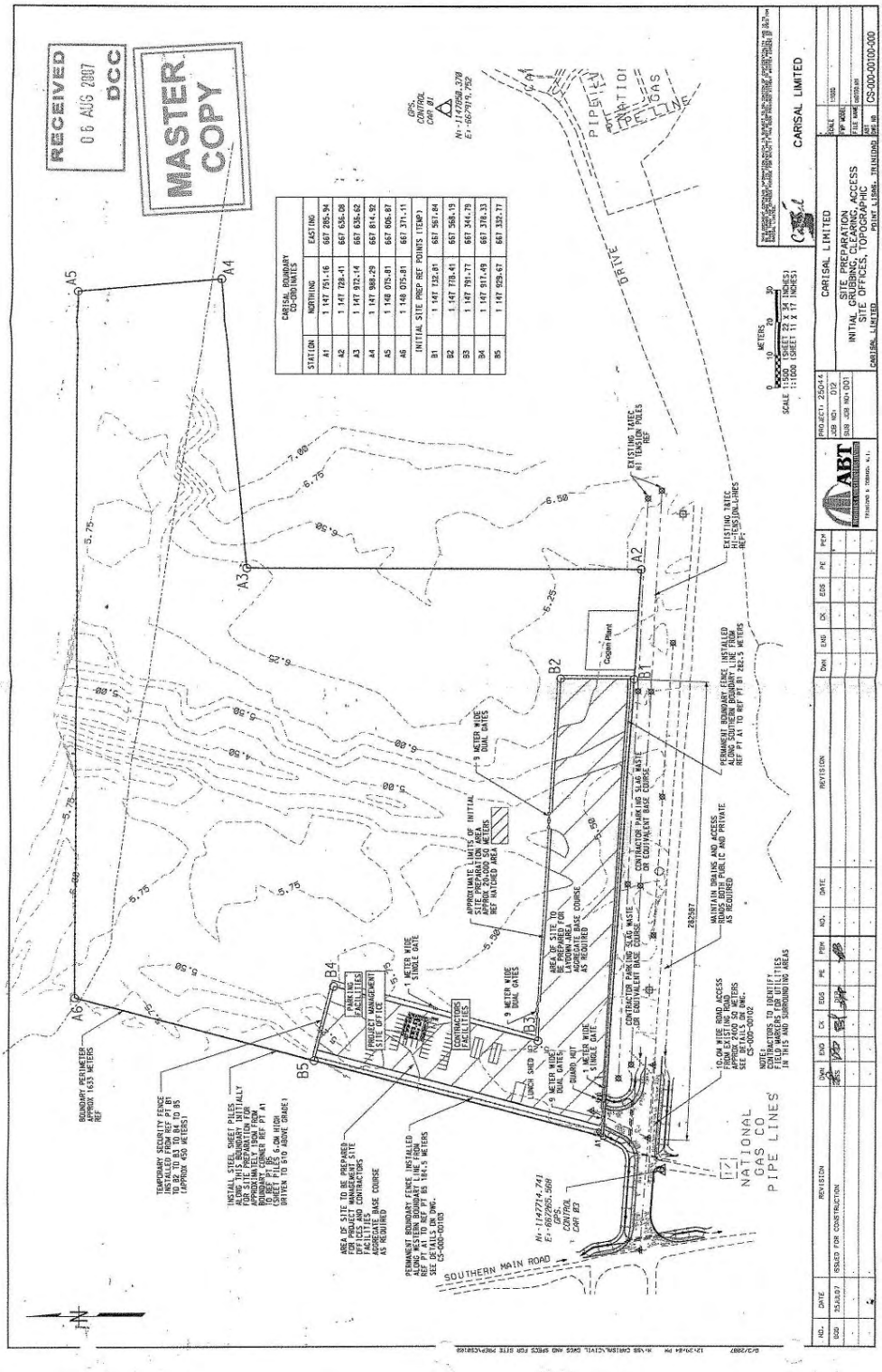
Trinidad and Tobago Seismicity: Maximum expected ground acceleration (gals) for 2% probability of exceedance in 50 years; period T= 0.2 sec



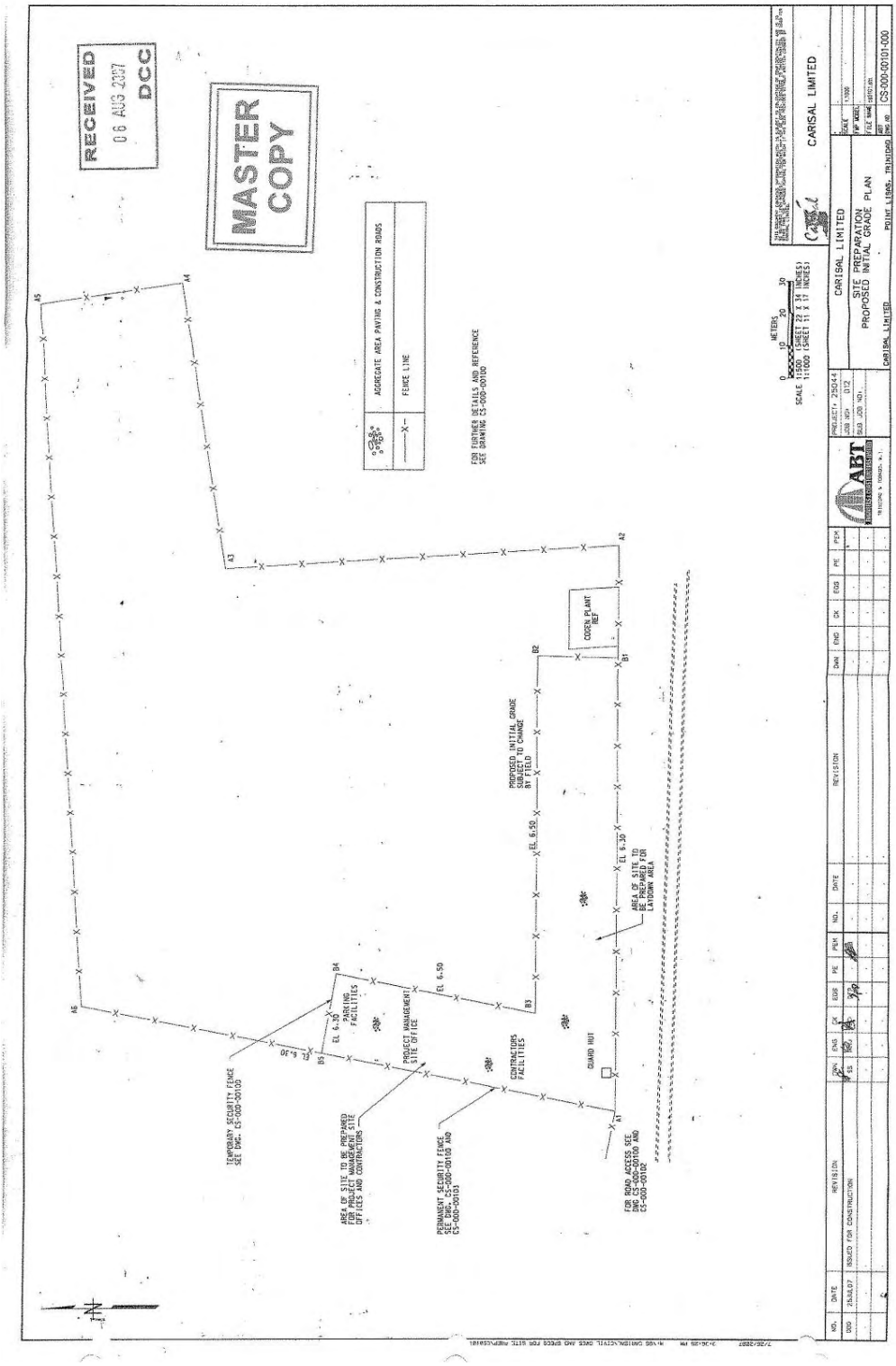
Trinidad and Tobago Seismicity: Maximum expected ground acceleration (gals) for 2% probability of exceedance in 50 years; period T= 1 sec

Topography Maps

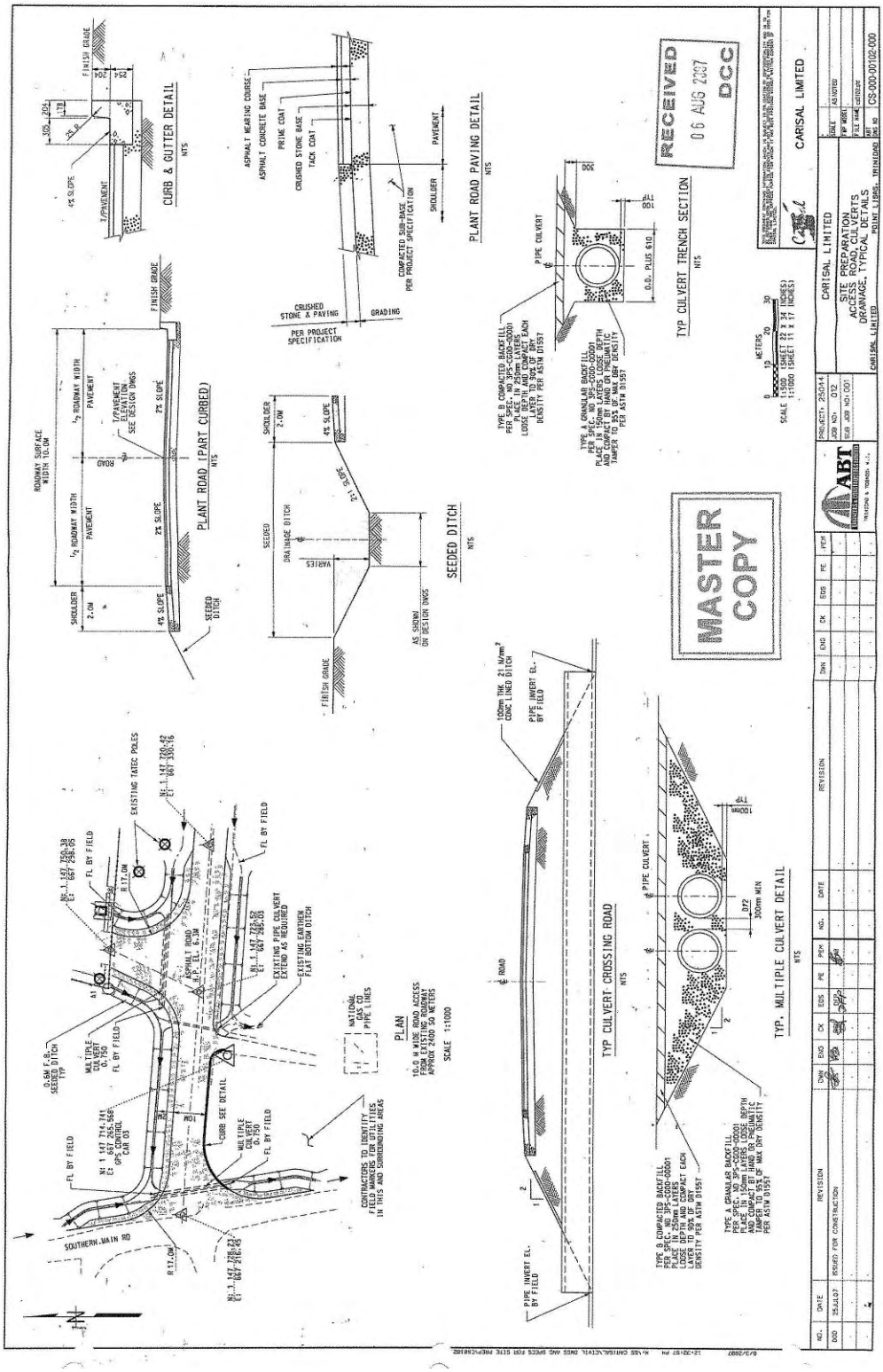
Document
CariSal Site Topographic Maps



CariSal site topographic map #1.



CariSal site topographic map #2.



CariSal site topographic map #3.

Noise Impacts

Document
Environmental Noise Monitoring at Carisal Limited
Supporting Data for Noise Impact Analysis
Table 1. Vehicular Activity In CariSal Operations
Table 2. Construction Noise Analysis for CariSal EIA Summary
Table 3. EMA Noise Standards
Table 4. Results by Receptor

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PROJECTServices
A DIVISION OF KAIZEN ENVIRONMENTAL SERVICES LIMITED

Corner Bahadoor Street,
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Tel .:(868) 636 - 7811
Fax.:(868) 636 - 9818 ext 37

REPORT

Environmental Noise Monitoring

At

Carisal Limited

Prepared For:

Carisal Limited
Point Lisas Industrial Estate,
Point Lisas,
Trinidad, W.I.

Prepared By:

Kaizen Environmental Services (Trinidad) Limited
Corner Bahadoor & Southern Main Road,
California
Trinidad, W.I.

Project Team Leader:

Nandlall Lall

Project Manager:

Rishi Pragg

Kaizen Project No.: 07-9102
August 3, 2007.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

1.0 INTRODUCTION 4

2.0 STUDY DESIGN 4

3.0 INSTRUMENTATION 5

4.0 TEST METHODOLOGY 5

5.0 RESULTS 7

6.0 CONCLUSION 7

ATTACHMENTS
- A. Data Sheets
- B. Test Certificates

EXECUTIVE SUMMARY

Carisal Limited commissioned Kaizen Environmental Services (Trinidad) Limited (*Kaizen*) to conduct Environmental Sound Pressure Level (SPL) or Noise Monitoring at their property. Monitoring was conducted at two (2) locations, each for a single 24-hour period. The objective of this assignment is to provide Carisal Limited with baseline data concerning the sound pressure levels.

A *Quest Model 2900* Integrating/ Data logging Sound Level Meter was used to conduct the measurements and complies with specifications as outlined in the EMA's[1] *Noise Pollution Control Rules 2001.*

The parameters monitored were as follows:

1. Equivalent Continuous Sound Pressure Level (L_{eq} or L_{av})
2. Instantaneous Unweighted Peak Sound Pressure Level (L_{pk})

Based on the investigation conducted the following conclusion can be made:

- The environmental noise measurements for L_{eq} and L_{pk} obtained at the two (2) locations monitored at the Carisal Limited's property, during the measurement period, were within their respective limits published by the EMA, regulating Industrial Areas, and General Areas.

[1] EMA – Environmental Management Authority of Trinidad & Tobago

1.0 Introduction

Carisal Limited commissioned Kaizen Environmental Services (Trinidad) Limited (*Kaizen*) to conduct Environmental Sound Pressure Level (SPL) or Noise Monitoring at their fence line. Carisal Limited is situated on Caribbean Drive in the Point Lisas Industrial Estate.

The objective of this assignment is to provide Carisal Limited with baseline data concerning the sound pressure levels at their property in Point Lisas.

The noise monitoring was conducted on July 27-28, 2007.

2.0 Study Design

As requested by Carisal Limited, Environmental Noise Monitoring was conducted at the following locations on the facility:

- North Field Location
- South Field Location

At each measurement location, readings for the parameters listed in Table 1 were taken:

Table 1: Measurement Parameters

Parameter	Units	Remarks
Equivalent Continuous Sound Pressure Level (L_{eq} or L_{av})	dBA	Monitoring instrument is set on 3 dB exchange rate, "Fast" response and "A-weighted" frequency characteristic
Instantaneous Unweighted Peak Sound Pressure Level (L_{pk})	dB (peak)	Monitoring instrument is set on 3 dB exchange rate, "Peak" response and "Linear" frequency characteristic

3.0 Instrumentation

3.1 General

For the determination of both parameters identified above, measurements were taken utilizing an instrument that complies with specifications as outlined in the EMA's[2] *Noise Pollution Control Rules 2001.*

Quest Model 2900 Integrating/ Data logging Sound Level Meters were used to conduct the measurements. This instrument model complies with applicable Type 2 portions of Type 2, ANSI S1.43-1997, IEC60651-1979, IEC60804-1985, PTB, CE Mark.

The Quest Model 2900 is one of the premier products within Quest's Advanced Series of Sound Level Meters. The 2900 provide General Purpose Type 2 accuracy. This meter incorporates an internal data logger allowing the user to store one or multiples of sound studies in the field for later printing or download to a computer.

The instruments were configured to log data at thirty (30)-minute intervals.

3.2 Calibration

The microphone needs to be calibrated to assure accurate readings. The microphone was calibrated before each recording session for complete records and data integrity. The microphone was calibrated using the Quest QC-10 Calibrator (114dB at 1000Hz output), which is the manufacturer-certified kit *(Test Certificate is appended – Attachment B).*

4.0 Test Methodology

4.1 Test Method

For determination of the L_{eq} and L_{pk} parameters, measurements were conducted in accordance with *The Noise Pollution Control Rules 2001, Second Schedule.*

[2] EMA – Environmental Management Authority of Trinidad & Tobago

4.2 Project Locations and Schedule

The project was conducted over a single 24-hour period as follows:

Table 2: Noise monitoring locations & duration.

Location #	Start Time	Stop Time	Location Description
1	July 27, 2007, 9:06 am	July 28, 2007, 9:15 am	North Field Location
2	July 27, 2007, 9:02 am	July 28, 2007, 9:08 am	South Field Location

4.3 Measurement of Sound Pressure Levels

Sampling using the Quest 2900 is performed on the detected sound level signal. The instantaneous amplitude of the detected signal was sampled for approximately **Twenty four (24) hours** for thirty-minute averages at each location.

For compliance with the prescribed standards, measurements were taken with the integrating-averaging sound level meter on the following settings:

(a) The Quest 2900 was set at the 3 dB exchange rate
(b) In determining the equivalent continuous sound pressure level, the meter was set on the "Fast" response and "A-weighted" frequency characteristics
(c) In determining the instantaneous unweighted peak sound pressure level, the meter was set on the "Peak" response and the "Linear" frequency characteristic.

In order to prevent measuring errors caused by wind blowing across the microphone, a windscreen was used.

5.0 Results

Table 3 summarizes the results of the environmental noise monitoring conducted at the Carisal Limited's property on July 27-28, 2007. The downloaded instrument data is appended as *Attachment A*.

The results in Table 2 have been compared against environmental standards published by the EMA in the "*Noise Pollution Control Rules, 2001*: First Schedule – Prescribed Standards, Zone I – Industrial Areas and Zone II-General Areas".

Table 3: Environmental Noise Level Results for July 27-28, 2007

Location #	Start Time	Stop Time	Location Description	L_{eq} (dBA)	L_{pk} (dB)
1	July 27, 2007, 9:06 am	July 28, 2007, 9:15 am	North Field Location	**53.8**	**109.2**
2	July 27, 2007, 9:02 am	July 28, 2007, 9:08 am	South Field Location	**51.1**	**106.3**
EMA[3] Standard for Industrial Areas				**75.0**	**130.0**
EMA Standard for General Areas (Day time)[4]				**80**	**120**
EMA Standard for General Areas (Night time)[5]				**65**	**115**

6.0 Conclusion

Based on the investigation conducted the following conclusion can be made:

- The environmental noise measurements for L_{eq} and L_{pk} obtained at the two (2) locations monitored at the Carisal Limited's property, during the measurement period, were within their respective limits published by the EMA regulating Industrial Areas, and General Areas for both day and night periods.

[3] EMA- Environmental Management Authority of Trinidad and Tobago
[4] Daytime-Mondays to Sundays every week, 8:00 am- 8:00 pm.
[5] Daytime-Mondays to Sundays every week, 8:00 pm - 8:00 am.

ATTACHMENTS

A. *Data sheets*

B. *Test Certificate-Quest SLM*

A. Data sheets

Carisal North Location.sdat

2900 Integrating/Logging Sound Level Meter

FW Version: 02.4 Serial Number: CDD090024

Name: Carisal Noise Monitoring

Company: Carisal

Work Area: Carisal North Location

Description: Serial No. : CDD090024

Comments:

Meter Calibration

114.2 dB 7/26/2007 10:08:47A

Calibrator Serial Number:

Calibration Date:

Group 1

Group Started:	7/27/2007 9:06:53AM
Group Ended:	7/28/2007 9:15:02AM
Run Time:	24:08:08

Date & Time	LEQ	LMAX	LPeak	LN10	LN90	OVL

Group 1 Test 1

Test Started: 7/27/2007 9:06:53AM
Test Ended: 7/28/2007 9:15:02AM
Run Time: 24:08:08

Measuring Parameters

Range: 50 - 110 dB
Weighting: A
Time Constant: Fast
Threshold: Off
Exchange Rate: 3 dB
Peak Weighting: C

Summary

Peak Level: 109.2 dB, 7/27/2007 2:02:10PM
Max Level: 92.5 dB, 7/27/2007 4:10:52PM
Min Level: 45.5 dB, 7/27/2007 5:15:53PM
Overload: 0.00%

LEQ:	53.8 dB	SEL(3):	103.0 dB	TWA:	58.6 dB	TAKM5:	57.7 dB
LDN:	60.1 dB	CNEL:	60.5 dB	Pa2Sec:	8.0		
L5:	57.8 dB	L10:	56.1 dB	L50:	52.2 dB	L90:	50.1 dB

Comments:

7/27/2007 9:36:53AM	54.1	72.1	96.8	55.8	50.5
7/27/2007 10:06:53A	52.9	64.6	102.0	54.9	49.9
7/27/2007 10:36:53A	53.2	72.9	98.3	54.6	50.1
7/27/2007 11:06:53A	52.8	71.4	97.3	55.0	49.6
7/27/2007 11:36:53A	54.8	77.0	95.4	55.3	50.5
7/27/2007 12:06:53PM	52.6	65.6	101.6	54.8	49.2
7/27/2007 12:36:53PM	52.4	73.4	103.4	54.3	49.1
7/27/2007 1:06:53PM	53.0	68.4	101.5	54.9	49.7
7/27/2007 1:36:53PM	53.7	70.5	100.7	55.7	49.9
7/27/2007 2:06:53PM	54.3	76.5	109.2	56.4	51.1
7/27/2007 2:36:53PM	54.1	66.6	99.8	57.1	49.9
7/27/2007 3:06:53PM	54.0	67.0	100.8	56.8	50.0
7/27/2007 3:36:53PM	52.8	65.6	98.5	55.0	49.9
7/27/2007 4:06:53PM	51.8	63.4	101.0	53.8	48.8
7/27/2007 4:36:53PM	56.5	92.5	100.4	54.5	49.3
7/27/2007 5:06:53PM	52.2	63.6	97.8	54.3	49.0
7/27/2007 5:36:53PM	51.9	66.8	97.3	53.5	48.9
7/27/2007 6:06:53PM	51.4	60.4	92.6	53.1	49.3
7/27/2007 6:36:53PM	51.4	62.4	89.7	53.1	49.3
7/27/2007 7:06:53PM	51.5	63.2	91.8	53.2	49.6

Date & Time	LEQ	LMAX	LPeak	LN10	LN90	OVL
7/27/2007 7:36:53PM	56.0	65.3	86.9	59.1	52.5	
7/27/2007 8:06:53PM	57.0	67.9	89.9	59.5	53.3	
7/27/2007 8:36:53PM	56.3	80.2	92.4	58.1	53.0	
7/27/2007 9:06:53PM	54.6	62.9	87.8	57.2	51.1	
7/27/2007 9:36:53PM	54.5	65.2	85.9	57.7	50.9	
7/27/2007 10:06:53PM	57.5	66.1	88.9	60.8	50.8	
7/27/2007 10:36:53PM	55.0	66.0	86.9	58.7	51.1	
7/27/2007 11:06:53PM	56.1	65.6	90.1	59.0	52.4	
7/27/2007 11:36:53PM	55.2	64.0	87.5	57.5	51.9	
7/28/2007 12:06:53AM	54.2	65.2	88.6	56.2	51.7	
7/28/2007 12:36:53AM	51.9	60.6	90.0	53.2	50.4	
7/28/2007 1:06:53AM	51.7	63.3	87.0	52.9	49.8	
7/28/2007 1:36:53AM	51.6	60.0	84.6	52.8	50.3	
7/28/2007 2:06:53AM	52.7	65.6	86.9	53.9	50.8	
7/28/2007 2:36:53AM	51.4	55.8	82.9	52.4	50.1	
7/28/2007 3:06:53AM	52.4	58.0	85.7	53.4	51.3	
7/28/2007 3:36:53AM	53.7	62.6	86.7	55.6	51.6	
7/28/2007 4:06:53AM	53.4	61.7	84.9	56.1	50.3	
7/28/2007 4:36:53AM	53.8	62.1	85.0	56.0	51.3	
7/28/2007 5:06:53AM	52.2	63.1	87.3	53.3	50.7	
7/28/2007 5:36:53AM	54.2	77.7	86.4	56.6	50.3	
7/28/2007 6:06:53AM	52.2	65.0	87.2	54.1	49.6	
7/28/2007 6:36:53AM	55.2	80.7	90.1	54.6	50.6	
7/28/2007 7:06:53AM	53.4	70.6	88.8	55.1	51.1	
7/28/2007 7:36:53AM	54.4	67.1	88.0	56.3	51.9	
7/28/2007 8:06:53AM	52.3	64.8	95.0	54.2	49.5	
7/28/2007 8:36:53AM	51.6	65.1	94.8	53.7	49.0	
7/28/2007 9:06:53AM	52.9	83.4	95.3	54.5	48.9	

Carisal 90023 South .sdat

2900 Integrating/Logging Sound Level Meter

FW Version: 02.4 Serial Number: CDD090023

Name: Carisal Noise Monitoring

Company: Carisal

Work Area:

Description: Carisal South Field Location

Comments:

Meter Calibration

114.1 dB 7/16/2007 12:04:29PI

Calibrator Serial Number:

Calibration Date:

Group 1

Group Started:	7/27/2007 9:02:47AI
Group Ended:	7/28/2007 9:08:02AI
Run Time:	24:05:14

Date & Time	LEQ	LMAX	LPeak	LN10	LN90	OVL

Group 1 Test 1

Test Started: 7/27/2007 9:02:47AM
Test Ended: 7/28/2007 9:08:02AM
Run Time: 24:05:14

Measuring Parameters

Range: 50 - 110 dB
Weighting: A
Time Constant: Fast
Threshold: Off
Exchange Rate: 3 dB
Peak Weighting: C

Summary

Peak Level: 106.3 dB, 7/27/2007 1:24:51PM
Max Level: 76.4 dB, 7/27/2007 9:03:20AM
Min Level: 42.9 dB, 7/27/2007 5:24:43PM
Overload: 0.00%

LEQ:	51.1 dB	SEL(3):	100.4 dB	TWA:	55.9 dB	TAKM5:	55.0 dB
LDN:	57.4 dB	CNEL:	57.7 dB	Pa2Sec:	4.3		
L5:	53.8 dB	L10:	52.4 dB	L50:	49.7 dB	L90:	47.4 dB

Comments:

7/27/2007 9:32:47AM	50.0	76.4	103.5	51.6	47.0
7/27/2007 10:02:47A	51.9	74.3	101.1	53.8	48.3
7/27/2007 10:32:47A	50.4	63.3	99.3	52.2	47.7
7/27/2007 11:02:47A	52.4	75.1	93.8	53.3	48.3
7/27/2007 11:32:47A	51.7	71.4	99.0	53.6	48.7
7/27/2007 12:02:47PM	51.7	69.1	97.6	53.8	48.5
7/27/2007 12:32:47PM	51.6	75.9	100.8	51.8	46.9
7/27/2007 1:02:47PM	50.6	67.9	96.9	52.3	46.9
7/27/2007 1:32:47PM	52.0	72.9	106.3	52.9	48.2
7/27/2007 2:02:47PM	53.7	71.8	99.0	53.7	47.7
7/27/2007 2:32:47PM	51.2	69.7	99.1	52.1	47.5
7/27/2007 3:02:47PM	49.6	65.2	96.0	51.6	46.7
7/27/2007 3:32:47PM	50.9	69.2	98.7	51.9	47.1
7/27/2007 4:02:47PM	50.5	69.4	96.6	52.2	46.6
7/27/2007 4:32:47PM	52.6	74.3	96.3	51.6	46.2
7/27/2007 5:02:47PM	48.9	65.2	95.0	50.7	45.6
7/27/2007 5:32:47PM	48.3	72.8	90.9	49.5	45.5
7/27/2007 6:02:47PM	48.4	65.7	95.2	50.5	45.7
7/27/2007 6:32:47PM	50.1	61.0	88.8	51.5	47.7
7/27/2007 7:02:47PM	48.7	61.0	90.3	50.2	46.7

Date & Time	LEQ	LMAX	LPeak	LN10	LN90	OVL
7/27/2007 7:32:47PM	51.1	61.4	84.9	53.6	47.7	
7/27/2007 8:02:47PM	50.0	57.7	87.9	52.1	47.4	
7/27/2007 8:32:47PM	51.1	66.3	87.7	53.0	49.1	
7/27/2007 9:02:47PM	49.7	56.3	84.1	50.9	48.5	
7/27/2007 9:32:47PM	52.3	63.1	83.9	55.1	48.6	
7/27/2007 10:02:47PM	56.8	66.1	87.7	61.4	49.6	
7/27/2007 10:32:47PM	52.0	66.1	84.8	53.1	49.2	
7/27/2007 11:02:47PM	51.5	58.0	85.6	52.8	49.7	
7/27/2007 11:32:47PM	51.2	61.7	86.5	52.5	49.7	
7/28/2007 12:02:47AM	50.2	57.5	82.5	51.4	48.8	
7/28/2007 12:32:47AM	50.7	59.3	85.0	51.7	49.6	
7/28/2007 1:02:47AM	50.0	57.6	87.9	51.1	48.8	
7/28/2007 1:32:47AM	49.8	55.9	82.5	51.1	48.5	
7/28/2007 2:02:47AM	49.8	55.7	83.5	50.8	48.8	
7/28/2007 2:32:47AM	49.3	54.9	83.2	50.3	48.3	
7/28/2007 3:02:47AM	49.8	53.1	85.2	50.8	48.8	
7/28/2007 3:32:47AM	50.3	72.2	95.8	51.2	49.1	
7/28/2007 4:02:47AM	50.7	58.9	85.6	51.8	49.2	
7/28/2007 4:32:47AM	50.5	57.2	84.5	51.5	49.3	
7/28/2007 5:02:47AM	49.6	55.7	81.9	50.6	48.5	
7/28/2007 5:32:47AM	49.8	57.6	84.4	51.5	47.7	
7/28/2007 6:02:47AM	52.3	62.2	86.4	54.7	49.4	
7/28/2007 6:32:47AM	53.2	65.2	83.3	55.3	50.2	
7/28/2007 7:02:47AM	54.4	74.8	97.4	54.6	48.2	
7/28/2007 7:32:47AM	50.4	63.8	87.2	52.6	47.2	
7/28/2007 8:02:47AM	50.7	67.4	88.7	51.7	48.2	
7/28/2007 8:32:47AM	48.6	67.7	90.7	50.1	46.0	
7/28/2007 9:02:47AM	49.1	64.9	91.4	50.5	46.0	

B. Test Certificate

PROJECTServices
A DIVISION OF KAIZEN ENVIRONMENTAL SERVICES LIMITED

Corner Bahadoor Street,
Southern Main Rd., California
Tel .:(868) 636 - 7811
Fax.:(868) 636 - 9818 ext 37

TEST CERTIFICATE

CLIENT NAME: Carisal

DATE: 27/08/07

DETAILS: QUEST SLM 2900

Date Calibrated	Equipment Description	Serial #	Response
27/08/07 27/08/07	QUEST 2900 SLM QUEST 2900 SLM	CDD090023 CDD090024	OK OK

THIS DOCUMENT IS TO CERTIFY THAT THE INSTRUMENT LISTED HAS BEEN INSPECTED, BY KAIZEN ENVIRONMENTAL SERVICES (TRINIDAD) LIMITED AND TESTED AT 114 DB AT 1000 HZ WITH QC 10 CALIBRATOR SERIAL # QIC120076

TEST DATE: 27/08/07

TESTED BY:

for Nandlal Lal

Sunil Bridgelal
Snr. Environmental Technician

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Supporting Data for Noise Impact Analyses

Table 1. Vehicular Activity in CariSal Operations

Trucks Inbound (from Savonetta Pier 4)								
Material	Vehicular Traffic	Notes		No. of Veh.	Round trips/ da/veh	Volume/ da (1-way trips)	Peak hr factor	Peak hr volume
Salt - 450 MT/da	5, 20-MT trucks /da @ 5 trips ea.	Assumed trips could be any da, any hr		5	5	50.0	0.042	2.1
Limestone – 325MT/da	6, 10-MTe trucks @ 5 trips ea.	Assumed trips could be any da, any hr		6	5	60.0	0.042	2.5
Lime - 30mt/day	1,10 MT truck /da @ 3 trips ea.	Assumed trips could be any da, any hr		1	3	6.0	0.042	0.3
Pallets, Empty 27-kg bags, Super (1-MT) sacks	3 container trucks every 2 weeks	Assumed trips could be any da, any hr		3	0.07	0.4	0.042	0.02
Trucks Outbound (to Savonetta Pier 1)								
Material	Vehicular Traffic	Capacity		No. of Veh.	Round trips/ da/veh	Volume/ da (1-way trips)	Peak hr factor*	Peak hr volume
Calcium Chloride 360mt/day	10, 20 MT trucks @ 2 trips/da, 7 da /wk			10	2	40.0	0.042	1.7
HCl (Hydrochloric acid)	2 Iso-container trucks/da@2 trips ea.	6,000 gal. ea.		2	2	8.0	0.042	0.3
Bleach	9 Iso-container trucks/da@2 trips ea.	6,000 gal. ea.		9	2	36.0	0.042	1.5
In-Plant								
Process	Vehicular Traffic	Run Hrs/ da	Avg. Distance travelled/da	No. of Veh.	Round trips/ da/veh	Volume/ da (1-way trips)	Peak hr factor*	Peak hr volume
Salt Saturation	1 Front-end loader 24/7	12	2 miles	1	--	--	--	--
HCL Reaction	1 Front-end loader 24/7	8	1.5 miles	1	--	--	--	--
Container Handling	1 Mobicon lifting machine	6	800 ft/da	1	--	--	--	--
Packaging	1 Fork lift	10	1,000 ft/da	1	--	--	--	--
Solid Waste Handling	1 Front-end loader & 1 dump truck (3 trips /da)	Assumed trips could be any da, any hr	24 miles	1	3	6.0	0.042	0.3
Total Truck Volumes						206.4		8.6
Employees	Vehicular Traffic			No. of Veh.	Round trips/ da/veh	Volume/ da (1-way trips)	Peak hr factor*	Peak hr volume
Autos/pickups/SUVs/min ivans/motor-cycles	80 employees, 2 shifts	All assumed to drive alone		80	1	160.0	0.5	80.0
Total Volumes All Vehicles						366.4		88.6

* PHF values:
0.1 = default for general roadway traffic
0.042 = 1/24 = volume assumed equally distributed throughout day
0.5 = employees maximum (40 workers leave and 40 arrive at shift change)

Table 2. Construction Noise Analysis for CariSal EIA Summary

							Estimated Noise Levels (dBA Except L_{max})			
Scen.	Construction Phase Description	Construction Activity Locations	Modelled Noise Source Locations	Construction Equipment Scenario	Dur-ation	Rec. #	L_{eq} Bkgnd.	L_{eq} Constr.	L_{eq} Total (red: >rel. std.)	L_{max} Constr.
1	Site preparation: Brush cutting & clearing, fill placement, grading	Entire site	Western site boundary opposite nearest residence, for maximum impact	One machine operating, assume loudest machine.	2 mo	R1, nearest residence west of site	53.8	70.7	70.8	74.7
2	Site preparation: Brush cutting & clearing, fill placement, grading, utilities	Entire site	Site centroid	9 machines max., per CariSal "Site Development.pdf"	2 mo	R1, nearest residence west of site	62.4	54.6	63.1	53.0
2A	Site preparation: Brush cutting & clearing, fill placement, grading, utilities	Entire site	Site centroid	Average activity – 5 machines (1 truck not 3, then 4 loudest units) instead of 9 max., per CariSal "Site Development.pdf"	2 mo	R1, nearest residence west of site	62.4	50.4	62.7	50.0
4	Plant area preparation: Brush cutting & clearing, fill placement, grading, utilities, excavation, foundation	Plant area	Plant area centroid	9 machines per CariSal "Site Development.pdf" + excavation/foundation machines (bold font)	2 mo	R1, nearest residence west of site	62.4	51.6	62.8	49.5
5	Plant erection	Plant area	Plant area centroid	Assumed equipment mix for erection	11 mo	R1, nearest residence west of site	53.8	45.4	54.4	45.5
6	Cooling tower site preparation: Brush cutting & clearing, fill placement, grading, excavation, utilities, foundations	Cooling tower area	Cooling tower pad centroid	2 machines operating (max. due to small area), assume loudest machines	2 mo	R1, nearest residence west of site	53.8	72.6	72.6	73.5
6	Cooling tower erection	Cooling tower area	Cooling tower pad centroid	2 machines operating (max. due to small area), assume loudest machines	2 mo	R1, nearest residence west of site	53.8	68.3	68.5	69.5
10	Site preparation: Brush cutting & clearing, fill placement, grading, utilities, excavation, foundation	Admin Bldg area	Admin Bldg pad	9 machines per CariSal "Site Development.pdf" + excavation/ foundation machines (bold font)	11 mo	R3, nearest residence east of site	62.4	65.2	67.1	63.1
11	Admin Bldg erection	Admin Bldg area	Admin Bldg pad	Assumed equipment mix for erection	11 mo	R3, nearest residence east of site	62.4	54.7	63.1	54.9

Table 3. EMA Noise Standards

EMA Zone	L_{eq} Absolute	L_{eq} Relative	L_{max} Absolute
Zone I (Anytime)	75	--	130
Zone III (Daytime)	80	Bkgnd. +5	120

Table 4. Results by Receptor

Scen						
2	**Results by Receptor for: Site Prep at Site Centroid – Total Machines = 9**					
	Rec	Dist.	Background*	Constr.	Total	Constr.
	1	208	53.8	63.9	64.3	62.3
	2	423	53.8	57.7	59.2	56.1
	3	577	62.4	55.0	63.1	53.4
	4	860	62.4	51.6	62.7	50.0
	4 @ N.fence, 9 units	608	62.4			
4	**Results by Receptor for: Site Prep at Plant Centroid – Total Machines = 11**					
	Rec	Dist.	Background*	Constr.	Total	Constr.
	1	245	53.8	63.0	63.5	60.9
	2	381	53.8	59.1	60.3	57.0
	3	585	62.4	55.4	63.2	53.3
	4	904	62.4	51.6	62.8	49.5
5	**Results by Receptor for: Plant Erection at Plant Area Centroid – Total Machines = 6**					
	Rec	Dist.	Background*	Constr.	Total	Constr.
	1	245	53.8	56.7	58.5	56.9
	2	381	53.8	52.9	56.4	53.0
	3	585	62.4			
	4	904	62.4			
9	**Results by Receptor for: Plant Efection at Cogen Pad Centroid ~ s. Fenceline – Total Machines = 6**					
	Rec	Dist.	Background*	Constr.	Total	Constr.
	1					
	2	257	53.8	56.3	58.3	56.5
	3					
	4					
2A	**Results by Receptor for: Site Prep at Site Centroid – Total Machines = 5**					
	Rec	Dist.	Background*	Constr.	Total	Constr.
	1	208	53.8	62.7	63.2	62.3
	2	423	62.7	63.2	62.3	56.1
	3	577	62.7	65.6	62.3	53.4
	4	860	62.4	62.7	65.6	62.3
		860				

Air Quality Impacts

Document
Air Dispersion Modeling Protocol from the Operation of the CariSal Trinidad Unlimited Chlor-alkali Facility (October 2007)
Ambient Air Quality Monitoring Program at the CariSal Site (December 2007)
Air Quality Modelling Results

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Air Dispersion Modeling Protocol from the Operation of the CariSal Trinidad Unlimited Chlor-alkali Facility located in the Point Lisas Industrial Estate Trinidad and Tobago, West Indies

Prepared for:

CariSal Trinidad Unlimited

Submitted to:

Environmental Management Authority

October 22, 2007

Prepared By:
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Project Background

CariSal Trinidad Unlimited (CariSal) proposes to construct a chlor-alkali plant for the production of calcium chloride, caustic soda, sodium hypochlorite and hydrochloric acid with water as a byproduct on a site adjacent to both the existing and proposed Point Lisas industrial estates. On December 22, 2006, CariSal submitted an application for a Certificate of Environmental Clearance to the Environmental Management Authority (EMA). EMA has reviewed that application and has determined that there would be significant environmental impacts that could arise from the proposed activities and that the application requires an Environmental Impact Assessment (EIA) in compliance with a Terms of Reference (TOR). The final TOR (issued by the EMA on August 16th, 2007) identifies the need for air quality modeling analysis as part of the EIA. This air dispersion modeling protocol is being submitted to EMA for review and approval prior to initiating the air quality modeling for the EIA.

This document summarizes the modeling protocol procedures that are planned for use in evaluating the facility's air quality impacts during construction and routine operation.. The protocol was developed on the basis of the methodologies recommended by the U.S. Environmental Protection Agency (EPA) *Guidelines on Air Quality Models* (GAQM), Appendix W to 40 US Code of Federal Regulations Part 51, recommendations provided in the CariSal project TOR and following methodologies used in EIA's for neighbouring projects, as deemed appropriate by the environmental review team.

Project Description

Location and Land Use

The proposed plant will occupy an approximately 11.8 hectare lot of land bounded on the north by parcel 4A of the proposed East and South Pt. Lisas Industrial Estate operated by the National Energy Corporation (NEC), on the east by a National Gas Company of Trinidad and Tobago Limited (NGC) pipeline corridor as well as a Trinidad and Tobago Electricity Commission (T&TEC) corridor, on the west by the Southern Main Road and the existing Point Lisas Industrial Estate operated by the Point Lisas Port Development Company (PLIPDECO), and on the south by the North Sea Road with the proposed Essar Steel plant further southwest, as well as the proposed Westlake ethylene complex further southeast.

The nearest meteorological station which measures the wind is EMA's aerometric monitoring unit located at PLIPDECO car park in the Point Lisas Industrial Estate and the next nearest is the Piarco International Airport located to the northeast of the project.

The proposed site is described as follows:

- The site is zoned for industrial development
- The area is flat to gently rolling flat terrain
- A map of the immediate area is shown in Figure 1 (*this map will ideally show the CariSal, Essar, and Westlake similar to Figure 7.15 (page 7-54) of the EIA for Essar including UTM coordinates and scale).*

- A land use assessment will be made for the purposes of air quality modeling using a 3-km radius circle centered on the facility with the circle divided into directional sectors (0 degrees being North, 90 degrees East, etc.) using the following five land use types of industrial, agricultural, residential, mangrove swamp and water. The land use information will be used to characterize the albedo, Bowen[1] ratio and surface roughness within each sector which is used by the air quality model. Four primary sectors have been identified as centered on the proposed facility. They run from 20 to 80 degrees, 80 to 175 degrees, 175 to 260 degrees and from 260 to 20 degrees. Some sectors have several land uses (e.g., 175 to 260 degrees has industrial, mangrove swamp, and water areas). When this is the case, the percentages of each land use type will be computed using a land area weighted-average. Based on the site-specific land-use and wet and dry season characteristics, a time and site-specific albedo, Bowen ratio and surface roughness values will be determined for each sector using Tables 4-1 through 4-3 of the AERMET User Guide (USEPA, 2004b). Land-use will be based on future land-use considerations (e.g., industrial settings for the Westlake and Essar sites).

Operational Emissions

Source Information

Emissions from the proposed chlor-alkali plant have been estimated based on a continuous operation of 24 hours a day, 7 days a week for 365 days per year[2]. Thus, the maximum short term emission rates is the same as the long-term emission rate and thus the same emission rate will be used in modeling for the short-term air quality permissible levels (< 24 hours) and the annual average permissible levels.

- The proposed plant would have the following emission source components:
  - Co-generation natural gas fired unit ranging from a total of 22.5 to 30 MW depending upon final engineering design decision
  - 94% Calcium Chloride Fluidized Bed Dryer
  - 77% Calcium Chloride Dryer and Cooler
  - Hydrogen Chloride Plant (w/scrubber)
  - Hydrogen Chloride Storage Tanks (w/scrubber)
  - Calcium Chloride Storage Tanks
  - Storage and packing of Calcium Chloride (w/scrubber)
  - Lime Dust Silo Vent (w/scrubber)
  - Diesel-fired firewater pump (max size of 150 hp)
  - Two emergency backup generators
  - Cooling tower
- The effect of building downwash at this facility will be reviewed and direction- specific building downwash parameters calculated using the USEPA Building Profile Input Program (BPIP), Version 95086, will be used if stack heights are below good engineering practice (GEP) and if the impact from building wake effects extends off the facility site.

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[1] Bowen Ratio – ratio of sensible heating to latent heating.

[2] It is anticipated that the plant will operate 350 days per year with shut downs only done for emergency repairs. Routine maintenance can be performed without interrupting operation of the plant. Therefore, the assumption of continuous operation is conservative.

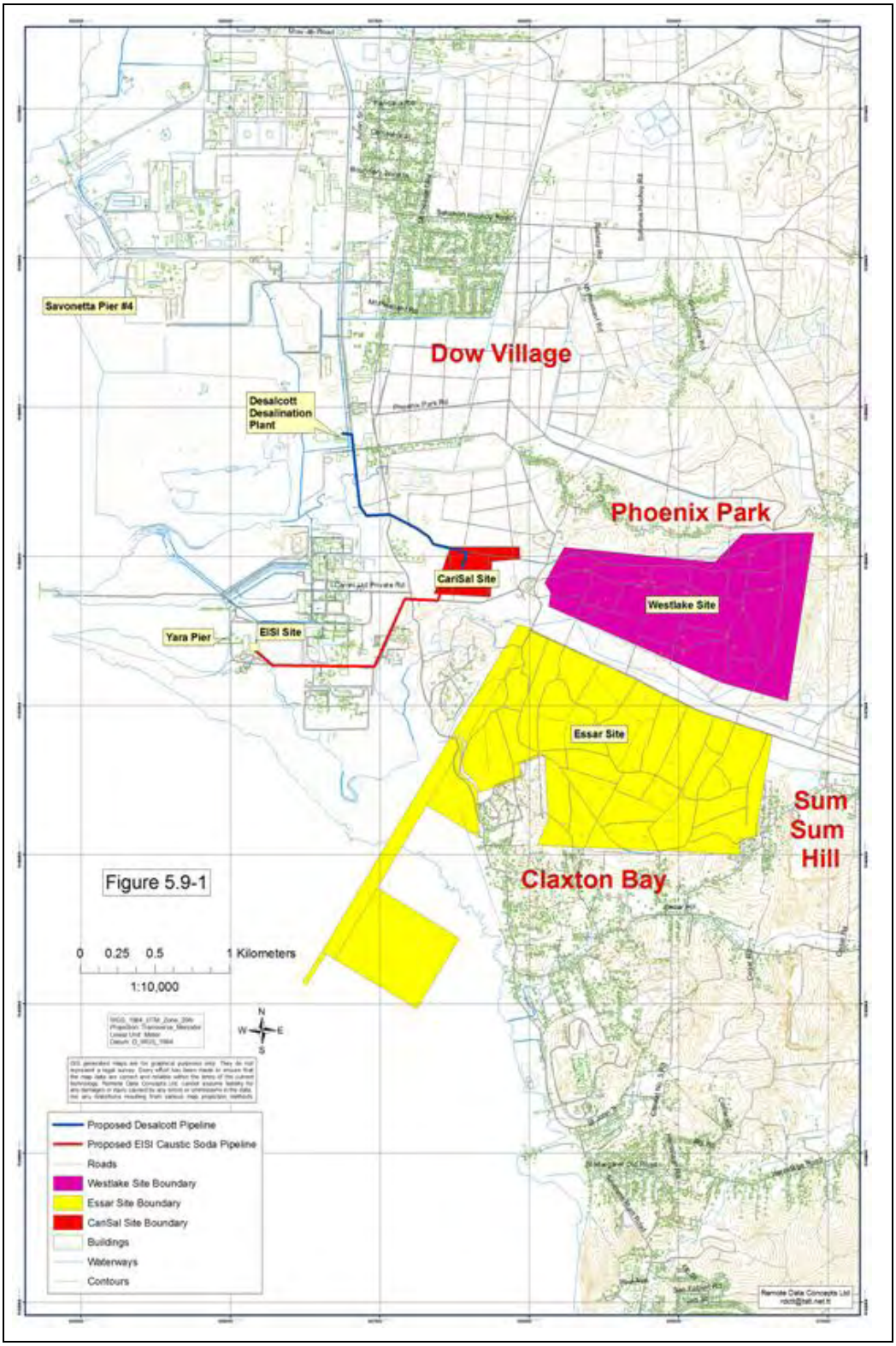

Figure 1. Area for CariSal facility.

- The major structures of the proposed plant are the following:
  - 42% calcium chloride liquid processing tanks (1 18,000 gallon receiver and 1-500,000 gallon storage)
  - Caustic soda storage tank (4 – 81, 000 gallon and 1- 15,000 gallon)
  - 12% Sodium Hypochlorite Storage Tanks (4 -45,000 gallon, 2 – 7,000 gallon)
  - Brine and solid feed tanks (26 tanks with a total capacity of 500,000 gallons)
  - HCl tanks (4 –receivers 20,000 gallons, 1 -400,000 gallon)
  - Feed (NaCl) tanks (1- 377,000 gallon, 1- 100,000 gallon, 2 -63,000 gallon)
  - Process water tanks (1 -600,000 gallon)
  - Raw water condensate system tanks (1 – 600,000 gallon)
  - Chlor alkali plant
  - Maintenance building
  - Administration building
  - 77% Calcium chloride flake plant
  - 94% calcium chloride pellet plant
  - Calcium chloride packing facility
  - Cooling tower (2 cells)
  - Gas-fired turbine generator (cogeneration plant)
  - Electrical substation building
  - Salt shed and lime bin
  - Limestone storage pile
  - Figure 2 provides the plot plan for the facility showing building and approximate stack locations.

Stack Information

- The facilities stack information (stack height, flow rate, exit temperature) are given in Table 1.

Estimated Emissions

- Table 1 also provides maximum emission rates through these vented sources including the HCl storage tanks through the HCl scrubber. The other storage tank emissions will also be included in the modeling but these emissions will be small as they will be limited to only evaporative emissions.

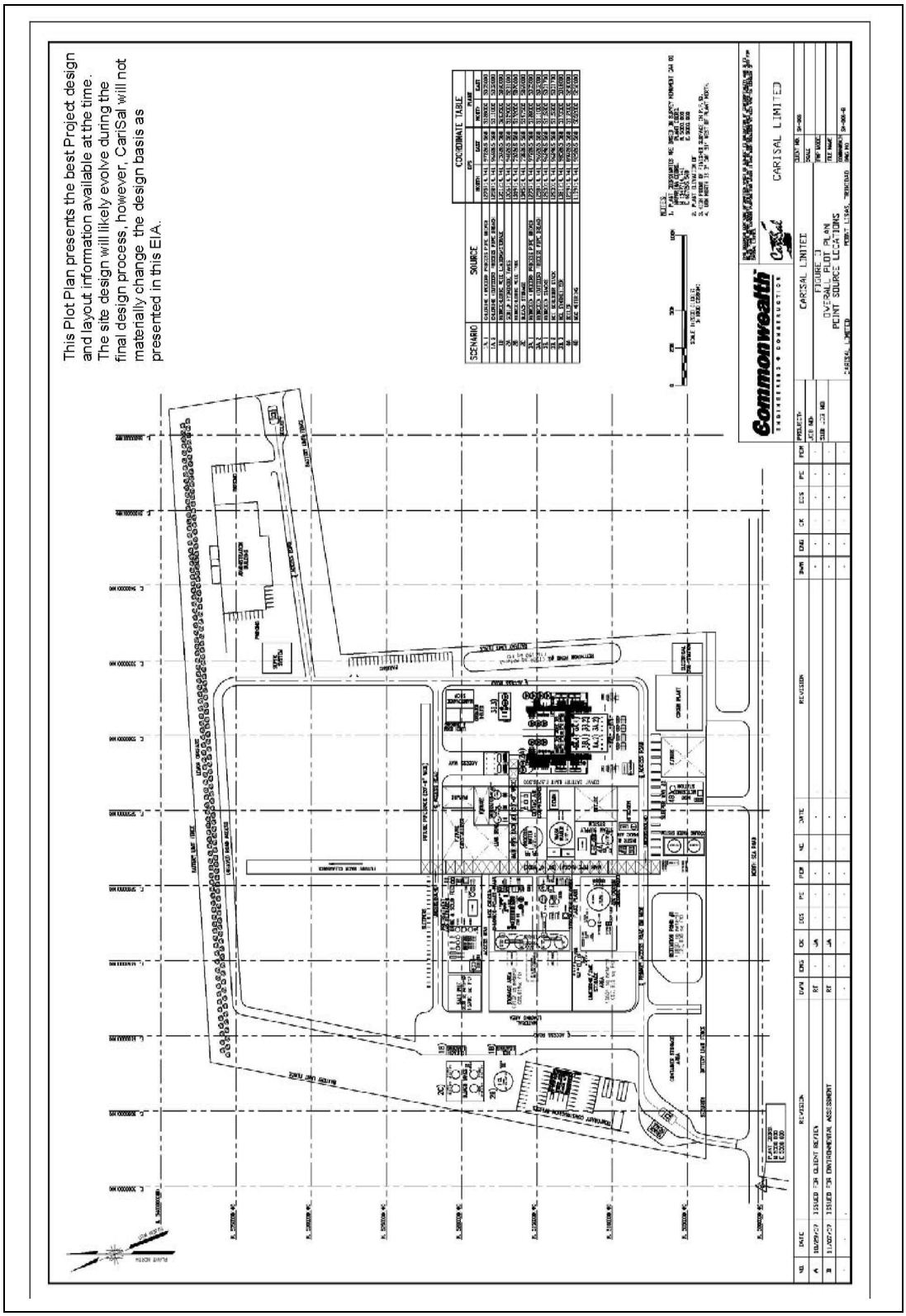

Figure 2. Plot plan for CariSal facility.

- The original design called for three (3) back up generation systems (one (1) back up generator for critical utilities and calcium chloride process equipment, and two, one each dedicated to the caustic soda production lines. One backup generator, for utilities and the calcium chloride process has been eliminated due to the facility design to operate with a cogeneration power unit. The two dedicated emergency back up diesel fired generators (500 kW each) for the caustic soda lines will be retained for safety shutdown service. The exhaust characteristic for the firewater pump is not known at this time, but will be typical for this type of equipment. Three types of storage piles will occur at the facility: 1) lime will be received as pebble lime by truck and be stored in covered bins; 2) limestone will be received as 5 cm (2 inch) by 10 cm (4 inch) size rock and be stored in an open pile up to 20,000 metric tons; and 3) up to 8,000 metric tons of salt (NaCl) will be stored in a covered shed. Because these sources will be housed (lime and salt) or received as amalgamated material (limestone) emissions to the ambient air will not occur from wind erosion and will not be included as an emission source in the air dispersion modeling analysis.

- For completeness, emissions from the routine operation of the facility from traffic related emissions will be included in the air quality modeling assessment. The traffic related emissions would be based on the average daily number of vehicles accessing the site (workers and deliveries) along with information on the diurnal pattern associated with these vehicles. Additional information on vehicle types (autos/light-duty motor vehicles, light-duty trucks, medium-duty trucks and heavy-duty trucks) along with fuel type (Trinidad and Tobago regulations currently allow up to 1500 ppm sulfur content for diesel) and average travel speeds while on the CariSal site and the average distance traveled on-site would be used in estimating emissions.

Emissions Controls

- Emissions controls for the plant will be documented in the EIA explaining the control technology and effectiveness of the control equipment for each type of scrubber unit employed.

Table 1. Maximum Annual Operational Emission Rate for the Chlor-Alkali Plant in Pt. Lisas													
Description	Stack height	Exit temp	Actual flow rate	Annual Average Emission rate (metric tons/year)									
				Gas-Phase Pollutants						Particulate Matter			
Process	meters	deg C	m^3/s	H_2	Cl_2	HCl	NOx	CO*	SO_2*	TSP Lime Dust	TSP $CaCl_2$	PM-10*	PM-2.5*
Hypochlorite (Cl_2 scrubbers)	22.9	39	0.17	N/A	0.014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HCl Storage Tanks (HCl scrubber)	29.0	40	0.24	117	N/A	0.024	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Electrolysis (Hydrogen excess)	10.0	87	0,.075	121	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Packing $CaCl_2$	12.2	40	0.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.3	N/A	N/A
94% Dryer	32	40	49.6	N/A	N/A	N/A	43	36.1	0.26	N/A	47.7	3.3	3.3
77% Dryer	27.4	40	4.7	N/A	N/A	N/A	1.2	1.0	0.007	N/A	15.9	0.09	0.09
77% Cooler	30.5	40	3.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15.9	N/A	N/A
Cogen (3 CH_4 fired @7.5 MW ea)**	15	517	52.5	N/A	N/A	N/A	97.7	25.0	1.04	N/A	N/A	2.02	2.02
Cooling Towers (both cells)	11.7	36	0.036	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.004	0.002
Lime Dust Silo Vent	12.2	40	0.48	N/A	N/A	N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A

Sources:

The Cl_2 and HCl scrubber and hydrogen excess emission rates were provided by the equipment supplier (CONVE &AVS). Packing $CaCl_2$, 77% dryer and cooler and limed dust silo vent emission are based on a very similar type of chlor-alkali facility, the General Chemical Canada Ltd Amherstburg Plant, that until recently was operating in Ontario, Canada. The 94% dryer was based on a similar type of dryer operating at the Sulzer Chemtech in Houston, Texas. The cooling tower specification was provided by SPX Corporation Technology based on the Marley brand of cooling towers.

* Based on same approach as NO_x natural gas fuel combustion, but used USEPA AP-42 emission factors from Tables 1.4 for external natural gas combustion for dryer and Tables 3.1-1 and 3.1-2 for turbines and AP-42 Chapter 13.4, Table 13.4-1 for Wet Cooling Tower with a drift flow rate of 25 gallons per minute and a total dissolve solid content of 11,500 ppm.

** Cogeneration unit is still under design and two other alternatives are under consideration; if design has not been finalized by time the air quality modeling is started then the option producing the highest emissions will be used in the air quality modeling. This would likely be the maximum generating size of 30MW total.

NOTES:

N/A – Not Applicable – no emissions of this pollutant associated with this process

Shaded emissions are only associated with combustion of natural gas

Construction Emissions

Initial construction of the Chlor-alkali facility will occur over an eleven month time period with initial site grubbing, filling and grading occurring during the first two months. Initial construction activities will consist of site preparation which will include the cutting the cane and grasses and grubbing the area to be occupied by the plant facilities which will cover an approximately area of 5 hectares. In addition, filling and grading work will also be required with the undeveloped portion of the site being leveled using the spoils from the plant site. It is expected that about 45% of the site vegetative cover will need to be cleared. It is estimated that the site will require 80,000 cubic meters of fill so that each month will see 40,000 cubic meters of fill. The equipment type, quantity and rate per day and per month used to complete this activity are shown in the table below.

Table 2. Equipment Associated with Site Preparation Activities for the CariSal Chlor-Alkali Plant in Pt. Lisas

		Earth Moved Per Day	Earth Moved Per Month
Equipment	Quantity	(m^3/day)	(m^3 /month)
Bulldozers	1	1,500	30,000
Excavators	1	2,000	40,000
Scraper Boxes	1	5,000	100,000
Trucks (fill)	3	2,000	--
Compactors	1	--	--
Motor graders	1	--	--
Water tender	1	--	--
Total per Month	9		170,000

Emissions estimates will be made based on the above construction equipment assuming the equipment is diesel fueled. For diesel we will assume Trinidad and Tobago's 1500 ppm diesel sulfur fuel content in estimating particulate matter emissions. Equipment will be operated on a 10 hour workday – 5 days a week. This operating information will be used in combination with the respective horsepower rating of the equipment to estimate emissions during the initial site preparation period. Emission factor from USEPA NONROAD model (Exhaust and Crankcase Emission Factors for NONROAD Engine Modeling-- Compression-Ignition, Report No. NR-009C, 2004) will be used from the applicable equipment assuming typical US age distribution for construction equipment. Fugitive emissions from earth movement activity will also be included in the analysis based primarily on USEPA AP-42, Chapter 13.2 – "Fugitive Dust Sources". For the on-road trucks, emissions will be estimated based on the gross vehicle weight rating (GVWR), average daily mileage traveled while at the facility and their average speed. Included in the air dispersion modeling will be a diurnal profile of construction vehicle activity. For construction activity taking place during the dry season CariSal will employ the standard best practices of watering trucks to minimize fugitive dust emissions.

Start-Up Emissions

Emission activities associated with the start-up of the Chlor-Alkali facility are still being developed at this time. However, if emissions from any process are greater than those during

routine operation, air quality modeling will be performed for the scenario that has the highest short-term emission rate and the results will be reported in the EIA. Preliminary engineering design suggests that emissions during start-up will be considerably less than during operation.

Regulatory Review Criteria

Standards and Criteria Levels

The proposed chlor-alkali facility will be a routine source of hydrochloride (HCl), chlorine (Cl_2), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate emissions and will include particles with all sizes of particulate mater also referred to as total suspended particulates (TSP), as well as the fraction as "inhalable" particles (those with effective diameters less than 10 micrometers (PM_{10})) and also fine particles - those with a mean mass diameter of less than 2.5 microns ($PM_{2.5}$). Table 3 shows the modeling averaging periods and levels of ambient air concentrations to which the modeling results will be compared for routine releases. For the purposes of the air quality impact assessment, all averaging periods will be based upon either short-term (hourly) or annual emission rates from each emission point and predicted concentrations for all averaging periods will be compared against the applicable ambient air quality standard.

Table 3 Summary of Applicable Trinidad Permissible Levels

Air Pollutant	Averaging Period	Permissible Level	Basis for Permissible Level
		(ug/m3)	
Total Suspended Particulate	24-hour	150	Trinidad Air Rules 2005
PM_{10}	24-hour	75	Trinidad Air Rules 2005
PM_{10}	Annual	50	Trinidad Air Rules 2005
$PM_{2.5}$	24-hour	65	Trinidad Air Rules 2005
$PM_{2.5}$	Annual	15	Trinidad Air Rules 2005
Hydrogen Chloride	30-minute	100	Trinidad Air Rules 2005
Chlorine	30-minute	300	Trinidad Air Rules 2005
Nitrogen dioxide (NO_2)	1-hour	200	Trinidad Air Rules 2005
Nitrogen dioxide (NO_2)	Annual	40	Trinidad Air Rules 2005
Carbon Monoxide	1-hour	30,000	Trinidad Air Rules 2005
Carbon Monoxide	8-hour	10,000	Trinidad Air Rules 2005
Sulfur Dioxide	24-hour	125	Trinidad Air Rules 2005
Sulfur Dioxide	Annual	50	Trinidad Air Rules 2005

Air Quality Analysis

Routine Operation and Start-Up

For the operational and start-up air quality analysis, the USEPA AERMOD (Version 07026) model is proposed for the air quality analysis. This latest version of USEPA's air quality models has undergone extensive model testing and evaluation in recent years and represents the current state-of-the-science and appropriate air quality model for assessing the potential emissions impacts on air quality from this facility. This relatively new steady-state Gaussian dispersion model developed by USEPA is aimed at short-range (< 50-km) dispersion from stationary industrial sources and was designed as a replacement to USEPA's ISC3 model. Relative to ISC3 AERMOD contains new or improved algorithms for: 1) dispersion in both the convective and stable boundary layers; 2) plume rise and buoyancy; 3) plume penetration into elevated inversions; 4) computation of vertical profiles of wind, turbulence, and temperature (via AERMET); 5) the urban nighttime boundary layer; 6) the treatment of receptors on all types of terrain; 7) the treatment of building wake effects using the improved PRIME wake effects modeling algorithm; 8) an improved approach for characterizing the fundamental boundary layer parameters; and 9) the treatment of plume meander and most recently the inclusion of the state of the science wet and dry deposition model. Because of the relatively low stacks (< 33 meters) and limited plume rise (except for cogeneration), maximum concentrations should be found within a few kilometers of the facility. Preliminary screening of the chlor-alkali facility supports the use of a near-field model - such as AERMOD - as maximum concentrations are all within a few kilometers of the facility. Use of the state-of-the-science building wake effects algorithm and deposition may be important in characterizing ambient air quality concentrations in the near field of the facility. Thus, AERMOD is proposed for this start-up and routine air quality impact analysis.

AERMOD will be run using two years of nearby representative on-site meteorological data from the EMA's Pt. Lisas monitoring site for 2005 and 2006. The monitoring site is located about 4.1 km north northwest of the CariSal site. The AERMET preprocessor model will be used to develop the meteorological dataset for use with the AERMOD. Meteorological data information on cloud cover will be used from Piarco International Airport (since this is not collected by the EMA) and to supplemental the on-site data when missing. AERMET also requires the use of morning upper-air data and we will use Piarco's upper-air sounding.

CariSal collected one month of data, which validated the use of the EMA Pt. Lisas meteorological data. The primary comparison here was for wind speed and wind direction.

AERMOD will be run using the following options:

- USEPA regulatory default options
- Direction-specific building downwash
- Missing meteorological data processing
- Direction specific dispersion processing (land-use based)
- Complex/intermediate terrain algorithms (if appropriate)
- In lieu of in-stack emissions test will assume:

75 percent NO_2 to NO_x ratio for annual NO_2 or ozone limiting method if 75 percent NO_2 is greater than ozone concentration (USEPA Guideline on Air Quality Models, Appendix W)

20 percent NO_2 to NO_x ratio for short-term (1-hour) conversion (10 percent in stack and 10 percent within hour of release based on the ozone-limiting approach)

Wet and dry deposition will be used in modeling the air quality impacts. AERMOD has two methods for estimating dry deposition. We propose to use Method 2 as the particle size distribution is not well known but a rough estimate can be made as shown in Table 4 below. Wet deposition will make use of hourly rainfall information collected by the EMA using the algorithm implemented in AERMOD.

Meteorological Data

The AERMOD meteorological preprocessor (AERMET) version 06341 will be used to process the Pt. Lisas (hourly wind speed, direction, temperature, and rain fall) and Piarco's cloud cover and upper-air data for use in AERMOD. AERMET uses the upper-air data to determine the convective mixing height (an estimate of the potential daytime mixing height). The convective mixing height is determined from the surface temperature and the vertical variation in the potential temperature as observed from the morning sounding. The daytime mixing height is then determined as the highest between the convective and mechanical mixing height.

Table 4. Size Distribution of Particulate Matter Emissions from the CariSal Chlor-Alkali Plant in Pt. Lisas Expressed as Fraction of Total Particulate Matter

Process	Dust > 44 µm (% of total)	TSP < 44 µm (% of total)	PM-10 <10 µm (% of total)	PM-2.5 < 2.5 µm (% of total)
Packing $CaCl_2$	51	49	4.4	2.5
94% Dryer*	35	65	5.9	3.3
77% Dryer*	35	65	5.9	3.3
77% Cooler*	37	63	5.7	3.2
Cogeneration Unit	0	100	71	57
Cooling Tower	0	100	70	42
Lime Dust Silo	0	0	1	99

Source(s): Size distribution information (except cooling tower) obtained for a similar facility that was operated by General Chemical Canada Ltd Amherstburg Plant, Ontario, Canada.
Cooling tower based on California South Coast Handbook of the California Emission Inventory Development and Reporting System (CEIDARS) Appendix A – Table A "Updated CEIDARS PM2.5 with PM2.5 Fraction".

* This only applies to calcium chloride emissions other PM emissions will be characteristic of the cogeneration unit

Ambient Conditions

Background air quality concentrations from the nearby EMA Pt. Lisas Air Quality Monitoring Unit (Shelter) will be used to develop background concentrations for TSP, particulate matter, SO_2, CO and NO_2. In addition, CariSal is conducting on-site ambient monitoring for these same pollutants plus HCl and Cl_2 for a one month period later this year. The higher combination of these two datasets will serve to establish the current maximum ambient air quality concentrations levels at the proposed CariSal site location.

The specific types of monitoring equipment to be used in the CariSal study include:

- PM_{10} will be measured using equipment which has been certified as equivalent to USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix J Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere.
- TSP will be measured using equipment which has been certified as equivalent to USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix B Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method).
- $PM_{2.5}$ will be measured using equipment which has been certified as equivalent to USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix J — Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere.
- Integrated 24-hour concentration of SO_2 will be determined in accordance with US EPA 40 CFR Part 50 Appendix A: "Reference Method for the Determination of Sulphur Dioxide in the Atmosphere (Pararosaniline Method).
- Hydrogen Chloride will be measured over 24-hours using NIOSH Method 7903 for the determination of Inorganic Acids in air.
- Carbon Monoxide will be measured using the USEPA-certified equipment of a Thermo Electron Corporation continuous 48i CO analyzer.
- Nitrogen Oxides (NO,NO_2 and total NOx) will be measured using the USEPA-certified equipment of a Thermo Electron Corporation continuous 42i analyzer.
- Chlorine gas will be measured using a single point monitor by Zellweger Analytics/ Honeywell. The key component of this unit uses a "chem-key" which will be sensitive to only the chlorine gas. The principal advantage of this instrument is its ability to detect relatively low gas concentrations (1 ppb).
- Meteorological data will be recorded hourly using a Davis Vantage Pro2 Plus Meteorological station. Measurements will include wind speed, wind direction, temperature, barometric pressure, rainfall, relative humidity and solar radiation.

RECEPTORS

Maximum Receptors

Based on preliminary screening modeling using EPA's SCREEN3 model, maximum impacts should fall within a few kilometers of the proposed facility. Thus, the selection of receptors in AERMOD to find the maximum impact will be as follows:

- The first run will be a 250-meter coarse grid with a nested Cartesian grid of 50 meter-spaced receptors as follows:
  - The 100-meter grid will extend approximately 1 km around the facility boundary
  - The 250-meter grid will extend approximately 5 km.
  - Receptors will be placed at 50 meter intervals around the property boundary.

- A second run will be made with fine grid receptors of 100 meter spacing centered on the coarse grid maximum receptor, should this occur in the 250-meter grid.

Sensitive Receptors

Potential receptor locations will be identified in relation to the distance from the facility boundary. Potential sensitive receptor locations will include inhabited buildings and structures including residential properties, schools and commercial properties, and also other off-site areas accessible to the public such as parks, playgrounds, tennis courts, and the like.

Impact Assessment

Routine Impact and Cumulative Impact Assessment

Air quality modeling would be performed using the AERMOD air quality model for the proposed CariSal facility using the emissions based on routine operations. In addition to the emissions from the CariSal facility we propose to include in the air quality modeling analysis the nearby proposed facilities using their operational short- and long-term emission rates as identified in their respective EIA's for the nearby Essar Steel Complex, the Westlake Ethylene Complex, and the National Gas Pipeline Loop Project, if applicable. Other emission would be assumed to be included as part of the background ambient monitoring.

Construction

In addition to the routine operation we proposed to model the emissions during the one-year construction period during the most activity period in which the site preparation occurs. Since this period is limited to only a few months only the short-term air quality impacts will be evaluated.

Output - Presentation of Results

The results of the routine air dispersion modeling analyses will be presented as follows:

- A summary of the results will be presented in tabular format and, where appropriate, selected spatial plots for locations outside the facility boundaries. These will show impacts for the pollutants that demonstrate highest impacts relative to the permissible air quality levels. Source contributions from the CariSal chlor-alkali facility will be identified.

- Modeling files as used for the AERMOD analysis will be provided in electronic format for the EMA's review.

REPORT

Ambient Air Quality Monitoring Program

At the

CariSal Site

Prepared For:

CariSal Unlimited

Point Lisas Industrial Estate,

Point Lisas, Couva

Trinidad, W.I.

Prepared By

Kaizen Environmental Services (Trinidad) Limited

 # 18 Casuarina Avenue

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Appendix I- Raw Data- Cl_2, NO_2, NO, NO_x, & CO

Appendix II-Raw Data- PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL

Appendix III-Raw Data- Meteorological data

Appendix IV- Wind Rose Plot

ATTACHMENTS

A. Test Certificates

B. Quality Control/Assurance

EXECUTIVE SUMMARY

CariSal Unlimited commissioned Kaizen Environmental Services (Trinidad) Limited to conduct Ambient Air Quality Monitoring at their site in the Point Lisas area. The contract duration was for 1-month, the frequency of the ambient air quality monitoring, as requested by CariSal Unlimited, was daily. The parameters measured, as requested by CariSal Unlimited were:

1. Particulate Matter (PM_{10})
2. Total Suspended Particulates (TSP)
3. Particulate Matter ($PM_{2.5}$)
4. Sulphur Dioxide (SO_2),
5. Oxides of Nitrogen (NO, NO_2, - NO_x)
6. Carbon Monoxide (CO)
7. Hydrogen Chloride (HCL)
8. Chlorine (CL_2)
9. Meteorological data

Based on the investigation conducted at the CariSal site from 25/10/2007 to 03/12/2007 the following conclusions can be made:

1. The 24-hour average concentrations obtained for PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL were within their respective EMA Draft Air Pollution Rules Third Schedule 2005. Note that both HCL and SO_2 were not detected at for the entire monitoring period.

2. The 1-hour Average concentrations and the Maximum concentrations obtained for Cl_2, NO_2, NO, NO_x, & CO for the respective thirty-day monitoring period were within their EMA Draft Air Pollution Rules, Third Schedule 2005.

1.0 Introduction

CariSal Limited, in October 2007, awarded a contract to Kaizen Environmental Services (Trinidad) Limited (*Kaizen*) to conduct ambient air quality monitoring at a proposed plant site in the Point Lisas area.
The contract duration was for 1-month; the frequency of the ambient air quality monitoring, as requested by CariSal Limited, was daily.
CariSal Limited initiated the air quality monitoring for specific parameters, to collect baseline data and ascertain trends during the contract period prior to the construction phase of a petrochemical plant.

2.0 Monitoring Locations

The monitoring location was situated at CariSal's site at the Point Lisas area. CariSal Limited selected the location for the ambient air quality monitoring, the coordinates are as follows:

Easting 0667786
Northing 1147965

3.0 Monitoring Parameters & Frequency

The parameters measured by CariSal Limited were:

Particulate Matter (PM_{10})
Total Suspended Particulates (TSP)
Particulate Matter ($PM_{2.5}$)
Sulphur Dioxide (SO_2)
Oxides of Nitrogen (NO, NO_2, -NO_x)
Carbon Monoxide (CO)
Hydrogen Chloride (HCl)
Chlorine (Cl_2)
Meteorological data

All of the above-listed parameters were monitored simultaneously for a 24-hour duration for thirty (30) continuous days at the sampling location.

4.0 Test Methodology

4.1 Particulates (PM_{10})

PM_{10} was measured using equipment specified in the USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix J Reference Method for the Determination of Particulate Matter as PM_{10} in the atmosphere.

The air sampler drawed ambient air at a constant flow rate into a specially shaped inlet where the suspended particulate matter is inertially separated into one or more size fractions within the PM_{10} size range. Each size fraction in the PM_{10} size range is then collected on a separate filter over the specified sampling period.

Each filter was weighed (after moisture equilibration) before and after use to determine the net weight (mass) gain due to collected PM10. The total volume of air sampled, corrected to EPA reference conditions (25 deg. C, 101.3 kPa), was determined from the measured flow rate and the sampling time. The mass concentration of PM_{10} in the ambient air was computed as the total mass of collected particles in the PM_{10} size range divided by the volume of air sampled, and was expressed in micrograms per standard cubic meter (μg/scm).

The precision of the PM_{10} sampler is 5 μg/scm for PM_{10} concentrations below 80 μg/scm and 7 % for PM_{10} concentrations above 80 μg/scm.

Because the size of the particles making up ambient particulate matter varies over a wide range and the concentration of particles varies with particle size, it is difficult to define the absolute accuracy of PM_{10} samplers.

4.2 Total Suspended Particulates (TSP)

TSP was measured in accordance with equipment specified in the USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix B Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method).

A high volume air sampler properly located at the measurement site, drawed a measured quantity of ambient air (~ 1,600 – 2,400 m^3) into a covered housing and through a glass fibre or quartz filter during a 24-hr (nominal) sampling period. The sampler flow rate and the geometry of the shelter favor the collection of particles up to 25 - 50 μm (aerodynamic diameter), depending on wind speed and direction. The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 μm particles.

The filter was weighed (after moisture equilibration) before and after sampling to determine the net weight (mass) gain. The total volume of air sampled, corrected to USEPA standard conditions (25 ^{o}C, 760 mmHg), was determined from the measured flow rate and the sampling time. The concentration of total suspended particulate matter in the ambient air was computed as the mass of collected particles divided by the volume of air sampled, corrected to standard conditions, and is expressed in micrograms per standard cubic meter (μg/scm).

The approximate concentration range of the method is 2 to 750 µg/scm. The absolute accuracy of the method is undefined because of the complex nature of atmospheric particulate matter.

4.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ was measured using equipment specified in the USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix J —Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere. A Retrofit kit made to be used with the same High Volume sampler as in Appendix J would be used on this sampler for separation of particles under $PM_{2.5}$ range.

An air sampler drawed ambient air at a constant flow rate into a specially shaped inlet where the suspended particulate matter is inertially separated into one or more size fractions within the $PM_{2.5}$ size range. Each size fraction in this size range is then collected on a separate filter over the specified sampling period.

Each filter is weighed (after moisture and temperature conditioning) before and after sample collection to determine the net gain due to collected PM2.5. The total volume of air sampled was determined by the sampler from the measured flow rate at actual ambient temperature and pressure and the sampling time. The mass concentration of $PM_{2.5}$ in the ambient air is computed as the total mass of collected particles in the $PM_{2.5}$ size range divided by the actual volume of air sampled, and was expressed in micrograms per cubic meter of air (µg/m3).

The lower detection limit of the mass concentration measurement range is estimated to be approximately 2 µg/am3 The upper limit of the mass concentration range is determined by the filter mass loading beyond which the sampler can no longer maintain the operating flow rate within specified limits due to increased pressure drop across the loaded filter. This upper limit cannot be specified precisely because it is a complex function of the ambient particle size distribution and type, humidity, the individual filter used, the capacity of the sampler flow rate control system, and perhaps other factors. Nevertheless, all samplers are estimated to be capable of measuring 24-hour PM2.5 mass concentrations of at least 200µg/m3 while maintaining the operating flow rate within the specified limits.

Note: All the filters collected for TSP, PM_{10} and $PM_{2.5}$ would be kept in proper storage for the perusal of CariSal Ltd.

4.4 Sulphur Dioxide (SO_2)

The concentration of SO_2 was determined in accordance with US EPA 40 CFR Part 50 Appendix A: "*Reference Method for the Determination of Sulphur Dioxide in the Atmosphere (Pararosaniline Method)*.

With this Method, a measured volume of air was bubbled through a solution of 0.04 M potassium tetrachloromercurate (TCM), which is contained in an impinger train assembly. The

SO_2 present in the air stream reacts with the TCM solution to form a stable monochlorosulfanomercurate complex.

Once formed, this complex resists air oxidation and is stable in the presence of strong oxidants such as ozone and oxides of nitrogen.

During subsequent analysis, the complex was reacted with acid bleached pararosaniline methyl sulfonic acid. The optical density of this species is determined spectrophotometrically at 548 nm and is directly related to the amount of SO_2 collected.

Based on results from a collaborative study conducted by the US EPA, the **lower limit of detection** of SO_2 in 10 ml of TCM is 0.75 µg. This represents a concentration of **13 µg SO_2/ m^3** (0.005 ppm). This lower detection limit can be met for this study.

4.5 Hydrogen Chloride (HCL)

Hydrogen Chloride was measured using Niosh Method 7903 for the determination of Inorganic Acids in air. This method utilizes a solid glass sorbent tube packed with a washed silica bead medium (400mg/200mg) and a glass fiber filter plug. Air was drawed through the sorbent tube at a fixed sampling rate between 0.2 to 0.5 L/min. A final maximum volume of 100 litres and a minimum sample volume of 3 litres is another method criterion.For this study the maximum sample volume would be collected for a 24 hour sample.

The range studied is 0.14 – 14 mg/m^3 or 0.5 – 200µg/sample. The limit of detection is 0.6 µg/sample.

Chlorine affects the applicability and accuracy of this method by interfering with the collection of the HCl gas on the silica gel beads, to show if this has occurred the Ion chromatograph can resolve for the hypchlorite peak showing up the chlorine gas (provided the peak is not too large), a weaker eluant could also be used and applied to the method.

4.4 Carbon Monoxide

Carbon Monoxide was tested using the Thermo 48i CO analyzer. This instrument uses gas filter correlation technology to measure the amount of carbon monoxide in the air. This instrument has a lower detection limit of 0.04 ppm and a preset range of 0 to 1000 or up to 10,000 ppm The Model 48i is based on the principle that carbon monoxide (CO) absorbs infrared radiation at a wavelength of 4.6 microns. Because infrared absorption is a nonlinear measurement technique, it is necessary for the instrument electronics to transform the basic analyzer signal into a linear output. The Model 48i uses an exact calibration curve to accurately linearize the instrument output over any range up to a concentration of 10,000ppm. Monitoring was done in the 0-50 ppm range and hourly averages calculated.

4.5 Oxides of Nitrogen (NOx)

Nitrogen Oxides (NO, NO_2 and total NO_x) was measured using the Thermo 42i analyzer. This instrument measures the amount of nitrogen oxides in the air from sub-ppm levels up to 1000ppm. This instrument has a lower detection limit of 0.4 ppb and user selectable preset ranges. This instrument was set in the 0-0.5 ppm range. The 42i has independent outputs for NO,

NO2, and NO_x, also each was calibrated separately. For each parameter the hourly averages was calculated and reported. Dual range and Auto range are standard features as well. If required, the instrument can be operated continuously in either the NO or NO_x modes allowing for response times of less than 5 seconds.

4.8 Chlorine Gas (CL_2)

Chlroine gas was measured using a Single point monitor by Zellweger Analytics/ Honeywell. This instrument consists of three (3) parts: The control unit, the chemcassettes, and the ChemKey. This SPM measures gas levels based on the rate of color change of the chemical cassette tape that reacts with the chlorine gas. The color intensity change of the tape is sensed by a photocell whose output is then converted to an analog output and digital display of the gas level. The percent of color change corresponds to how many ppm is present. A "chem-key" on the SPM determines the type of gas monitored and sets the range span for the gas, and also adjusts measurement time and internal calibration according to a factory-set algorithm. This is the calibrated tool of the entire system. The main advantage of this instrument is its ability to detect relatively low gas concentrations (4 ppb).

As a quality control procedure the whole unit can be sent to the factory along with the "Chem Key" for factory calibration. (This would take 10 days prior to shipping)

5.0 Results

Table 1 presents the Ambient Air Quality Testing Results for: TSP, PM_{10}, $PM_{2.5}$, SO_2, and HCL results, reported as 24-hour average concentrations.

Table 2 presents the Ambient Air Quality Testing Results for: Cl_2, NO_2, NO, NO_x, & CO. The results presented in this table represent a 30-day Average concentration for the hourly data obtained.

Section 5.1 presents the meteorological data for the monitoring period.

Table 1: Ambient Air Quality Testing Results - PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL

Sample Period/ 2007				Parameter Concentration (24-hr Average) [1]				
From		To		TSP	PM_{10}	$PM_{2.5}$	SO_2	HCL
Date	Time	Date	Time	(µg/Nm³)	(µg/Nm³)	(µg/Nm³)	(µg/Nm³)	(µg/Nm³)
25/10/07	3:00 pm	26/10/07	9:30 am	28.61	20.46	10.09	BDL	BDL
26/10/07	9:30 am	27/10/07	9:30 am	24.03	22.28	10.08	**BDL**	**BDL**
27/10/07	9:30 am	28/10/07	9:30 am	29.16	19.48	7.31	BDL	BDL
28/10/07	9:30 am	29/10/07	9:30 am	25.84	21.75	6.25	BDL	BDL
29/10/07	9:30 am	30/11/07	9:30 am	32.84	22.35	7.27	BDL	BDL
30/11/07	9:30 am	31/11/07	9:30 am	48.40	34.19	10.82	BDL	BDL
31/11/07	9:30 am	1/11/07	9:00 am	30.02	14.13	1.96	**BDL**	BDL
1/11/07	9:00 am	2/11/07	9:00 am	26.15	16.19	5.58	BDL	BDL
2/11/07	9:00 am	3/11/07	9:00 am	24.52	15.80	6.81	BDL	BDL
3/11/07	9:00 am	4/11/07	9:00 am	12.25	30.28	6.92	BDL	BDL
4/11/07	9:00 am	5/11/07	9:00 am	41.64	19.89	7.42	BDL	BDL

Table 1: Ambient Air Quality Testing Results - PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL								
Sample Period/ 2007				Parameter Concentration (24-hr Average) [1]				
From		To		TSP	PM_{10}	$PM_{2.5}$	SO_2	HCL
Date	Time	Date	Time	(µg/Nm³)	(µg/Nm³)	(µg/Nm³)	(µg/Nm³)	(µg/Nm³)
5/11/07	9:00 am	6/11/07	9:00 am	14.15	18.71	7.07	BDL	BDL
6/11/07	9:00 am	7/11/07	9:00 am	55.88	20.93	5.18	BDL	BDL
7/11/07	9:00 am	8/11/07	9:00 am	32.01	18.24	7.52	BDL	BDL
8/11/07	9:00 am	9/11/07	9:00 am	21.42	9.64	5.54	BDL	BDL
9/11/07	9:00 am	10/11/07	9:00 am	17.68	17.61	4.73	BDL	BDL
10/11/07	9:00 am	11/11/07	9:00 am	89.03	60.05	20.84	BDL	BDL
11/11/07	9:00 am	12/11/07	9:00 am	52.94	38.89	14.36	BDL	BDL
12/11/07	9:00 am	13/11/07	9:00 am	57.10	42.07	14.99	BDL	BDL
13/11/07	9:00 am	14/11/07	9:00 am	38.14	29.22	8.48	BDL	BDL
14/11/07	9:00 am	15/11/07	9:00 am	31.07	19.35	3.93	BDL	BDL
15/11/07	9:00 am	16/11/07	9:00 am	56.70	22.52	7.74	BDL	BDL
16/11/07	9:00 am	17/11/07	9:00 am	33.93	11.13	5.58	BDL	BDL
17/11/07	9:00 am	18/11/07	9:00 am	46.59	34.04	10.64	BDL	BDL
18/11/07	9:00 am	19/11/07	9:00 am	54.23	14.86	12.08	BDL	BDL
19/11/07	9:00 am	20/11/07	9:00 am	54.90	35.98	7.41	BDL	BDL
20/11/07	9:00 am	21/11/07	9:00 am	35.14	24.38	5.47	BDL	BDL
21/11/07	9:00 am	22/11/07	9:00 am	28.07	21.52	6.18	**BDL**	BDL
22/11/07	9:00 am	23/11/07	9:00 am	59.46	31.19	8.07	BDL	BDL
23/11/07	9:00 am	24/11/07	9:00 am	28.29	16.59	3.00	BDL	BDL
24/11/07	9:00 am	25/11/07	9:00 am	47.39	31.45	6.65	BDL	BDL
EMA Draft Air Pollution Rules 2005				**150**	**75**	**65**	**125**	**100**

Notes on Table 1:

a) BDL – Below Detection Limit
(i) SO_2 Method Detection Limit = 13 µg/Nm^3
(ii) HCL Method Detection Limit = 3.6 µg/Nm^3
b) Monitoring dates of 3-4 November 2007 and 5-6, November 2007, PM_{10} values were more than TSP values. This was a discrepancy that was obtained during the monitoring. TSP values should be more than PM_{10} values, however the samplers were not placed at the exact same location, and it is possible for such errors to occur in monitoring situations.

Table 2: Ambient Air Quality Testing Results (Average, Maximum and Minimum values for – Cl_2, NO_2, NO, NO_x, & CO																
Sampling Period		Parameter Concentration (µg/m³)														
		CL_2			NO_2			NO			NO_x			CO		
Start	End	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
25/10/2007	25/11/2007	<11.0	15.0	<11.0	15.8	71.7	<0.8	12.9	98.9	<0.5	26.0	129.2	<1.2			
2/11/2007	3/12/2007													112.9	415.5	<46.0
EMA Guidelines (µg/m³)		**300**			**200**			**-**			**-**			**30,000**		

2.0

Note Table 2:

1. The results presented above represent the 30-day concentrations for the hourly data obtained.
2. The above concentrations were calculated from the entire thirty (30) day monitoring period.
3. For Average and Maximum values, only those values that were detected were used in the calculation.
4. Start up of CO monitoring was delayed due to equipment repairs.

5.1 Meteorological Monitoring
5.2

Average Meteorological Conditions during Monitoring Period (25th October 2007 to 3rd December 2007)						
Date	Average Wind Speed (m/s)	Average Wind Direction (Degrees)	Average Temperature (°C)	Average Relative Humidity (%)	Average Barometric Pressure (mmHg)	Average Rainfall (mm)
25/10/2007 to 3/12/2007	1.34	87.74	20.06	84.12	766.18	0.15

Winds were mainly from the *East Northeast and Northeast* with maximum wind speeds of 5.8 m/s and experienced periods of calm for 53.4 % of the time.

The Wind Rose plot is attached *(Appendix IV)*.

3.0 6.0 Conclusion

Based on the investigation conducted at the CariSal site from 25/10/2007 to 03/12/2007 the following conclusions can be made:

1. The 24-hour average concentrations obtained for PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL were within their respective EMA Draft Air Pollution Rules Third Schedule 2005. Note that both HCL and SO_2 were not detected at for the entire monitoring period.

2. The 1-hour Average concentrations and the Maximum concentrations obtained for Cl_2, NO_2, NO, NO_x, & CO for the respective thirty-day monitoring period were within their EMA Draft Air Pollution Rules Third Schedule 2005.

Appendix I

Raw Data

Cl_2, NO_2, NO, NO_x, & CO

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO

Sampling	Sampling Period		1-Hr Conc. (µg/m³)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
10/25/2007	16:30	17:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	17:30	18:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	18:30	19:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	19:30	20:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	20:30	21:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	21:30	22:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	22:30	23:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
25-26, October	23:30	0:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
10/26/2007	0:30	1:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	1:30	2:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	2:30	3:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	3:30	4:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	4:30	5:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	5:30	6:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	6:30	7:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	7:30	8:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	8:30	9:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	9:30	10:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	10:30	11:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	11:30	12:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	12:30	13:30	(<11)	2.5	(<0.5)	2.5	
	13:30	14:30	(<11)	2.8	(<0.5)	2.8	
	14:30	15:30	(<11)	1.9	3.7	5.6	
	15:30	16:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	16:30	17:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	17:30	18:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	18:30	19:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	19:30	20:30	15	(<0.8)	(<0.5)	(<1.2)	
	20:30	21:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	21:30	22:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	22:30	23:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
26-27, October	23:30	0:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
10/27/2007	0:30	1:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	1:30	2:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	2:30	3:30	(<11)	(<0.8)	(<0.5)	(<1.2)	

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m³)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
10/27/2007	3:30	4:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	4:30	5:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	5:30	6:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	6:30	7:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	7:30	8:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	8:30	9:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	9:30	10:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	10:30	11:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	11:30	12:30	(<11)	0.9	3.4	4.3	
	12:30	13:30	(<11)	(<0.8)	3.7	3.7	
	13:30	14:30	(<11)	(<0.8)	3.7	3.7	
	14:30	15:30	(<11)	(<0.8)	4.0	4.0	
	15:30	16:30	(<11)	(<0.8)	4.0	4.0	
	16:30	17:30	(<11)	0.9	4.9	5.8	
	17:30	18:30	(<11)	1.9	4.3	6.2	
	18:30	19:30	(<11)	3.8	7.7	11.4	
	19:30	20:30	(<11)	5.6	10.1	15.8	
	20:30	21:30	(<11)	2.8	4.3	7.1	
	21:30	22:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	22:30	23:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
27-28 October, 2007	23:30	0:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
10/28/2007	0:30	1:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	1:30	2:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	2:30	3:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	3:30	4:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	4:30	5:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	5:30	6:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	6:30	7:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	7:30	8:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	8:30	9:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	9:30	10:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	10:30	11:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	11:30	12:30	(<11)	2.8	5.2	8.0	
	12:30	13:30	(<11)	2.8	6.7	9.6	
	14:30	15:30	(<11)	3.8	5.2	9.0	

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m³)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
10/28/2007	15:30	16:30	(<11)	2.4	4.6	7.0	
	16:30	17:30	(<11)	3.3	9.2	12.5	
	17:30	18:30	(<11)	2.4	6.1	8.5	
	18:30	19:30	(<11)	1.9	5.8	7.7	
	19:30	20:30	(<11)	1.3	4.5	5.8	
	20:30	21:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	21:30	22:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	22:30	23:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
28-29, October, 2007	23:30	0:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
10/29/2007	0:30	1:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	1:30	2:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	2:30	3:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	3:30	4:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	4:30	5:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	5:30	6:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	6:30	7:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	7:30	8:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	8:30	9:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	9:30	10:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	10:30	11:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	11:30	12:30	(<11)	(<0.8)	(<0.5)	(<1.2)	
	12:30	13:30	(<11)	3.8	4.9	8.7	
	13:30	14:30	(<11)	1.9	6.1	8.0	
	14:30	15:30	(<11)	3.3	7.7	11.0	
	15:30	16:30	(<11)	2.4	6.4	8.8	
	16:30	17:30	(<11)	1.9	5.5	7.4	
	17:30	18:30	(<11)	(<0.8)	3.4	3.8	
	18:30	19:30	(<11)	1.4	2.5	3.9	
	19:30	20:30	(<11)	1.9	2.5	4.3	
	20:30	21:30	(<11)	1.9	2.5	4.3	
	21:30	22:30	(<11)	1.9	2.8	4.6	
	22:30	23:30	(<11)	1.9	3.4	5.3	
29-30, October, 2007	23:30	0:30	(<11)	3.8	2.8	6.5	
10/30/2007	0:30	1:30	(<11)	3.3	2.8	6.1	
	1:30	2:30	(<11)	2.8	2.8	5.6	

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m³)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
10/30/2007	2:30	3:30	(<11)	1.9	2.5	4.3	
	3:30	4:30	(<11)	1.9	3.4	5.3	
	4:30	5:30	(<11)	1.9	3.1	4.9	
	5:30	6:30	(<11)	1.9	3.4	5.3	
	6:30	7:30	(<11)	2.8	3.7	6.5	
	7:30	8:30	(<11)	5.2	3.7	8.9	
	8:30	9:30	(<11)	7.5	7.7	15.2	
	9:30	10:30	(<11)	(<0.8)	12.6	24.8	
	10:30	11:30	(<11)	16.9	9.2	26.1	
	11:30	12:30	(<11)	19.4	5.7	25.2	
	12:30	13:30	(<11)	1.9	6.1	8.0	
	13:30	14:30	(<11)	3.3	7.7	11.0	
	14:30	15:30	(<11)	2.4	6.4	8.8	
	15:30	16:30	(<11)	1.9	5.5	7.4	
	16:30	17:30	(<11)	(<0.8)	3.8	3.8	
	17:30	18:30	(<11)	1.4	2.5	3.9	
	18:30	19:30	(<11)	1.9	2.5	4.3	
	19:30	20:30	(<11)	1.9	2.5	4.3	
	20:30	21:30	(<11)	1.9	2.8	4.6	
	21:30	22:30	(<11)	1.9	3.4	5.3	
	22:30	23:30	(<11)	3.8	2.8	6.5	
30-31, October, 2007	23:30	0:30	(<11)	3.3	2.8	6.1	
10/31/2007	0:30	1:30	(<11)	2.8	2.8	5.6	
	1:30	2:30	(<11)	1.9	2.5	4.3	
	2:30	3:30	(<11)	1.9	3.4	5.3	
	3:30	4:30	(<11)	1.9	3.1	4.9	
	4:30	5:30	(<11)	5.2	3.7	8.9	
	5:30	6:30	(<11)	1.9	3.4	5.3	
	6:30	7:30	(<11)	2.8	3.7	6.5	
	7:30	8:30	(<11)	3.8	6.4	10.2	
	8:30	9:30	(<11)	5.2	3.7	8.9	
	9:30	10:30	(<11)	7.5	7.7	15.2	
	10:30	11:30	(<11)	12.2	12.6	24.8	
	11:30	12:30	(<11)	16.9	9.2	26.1	
	12:30	13:30	(<11)	19.4	5.7	25.2	

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
10/31/2007	13:30	14:00	(<11)	10.3	4.2	13.7	
	14:00	15:00	(<11)	6.4	1.3	7.8	
	15:00	16:00	(<11)	4.2	(<0.5)	4.9	
	16:00	17:00	(<11)	13.4	1.1	14.5	
	17:00	18:00	(<11)	(<0.8)	1.4	1.4	
	18:00	19:00	(<11)	(<0.8)	(<0.5)	(<1.2)	
	20:00	21:00	(<11)	(<0.8)	0.9	(<1.2)	
	21:00	22:00	(<11)	(<0.8)	1.0	1.4	
	22:00	23:00	(<11)	3.4	1.3	4.7	
	23:00	0:00	(<11)	(<0.8)	1.5	1.7	
11/01/2007	0:00	1:00	(<11)	(<0.8)	2.0	2.0	
	1:00	2:00	(<11)	(<0.8)	2.3	2.4	
	2:00	3:00	(<11)	(<0.8)	3.2	3.5	
	3:00	4:00	(<11)	(<0.8)	3.5	3.6	
	4:00	5:00	(<11)	(<0.8)	4.4	4.4	
	5:00	6:00	(<11)	(<0.8)	5.6	5.7	
	6:00	7:00	(<11)	(<0.8)	7.0	7.1	
	7:00	8:00	(<11)	6.5	9.7	16.2	
	8:00	9:00	(<11)	4	7.9	11.9	
	9:00	10:00	(<11)	5.3	6.9	12.3	
	10:00	11:00	(<11)	8.3	7.2	15.5	
	11:00	12:00	(<11)	10	7.8	17.8	
	12:00	13:00	(<11)	5.7	6.6	12.4	
	13:00	14:00	(<11)	2.5	7.8	10.3	
	14:00	15:00	(<11)	0.9	6.7	7.6	
	15:00	16:00	(<11)	(<0.8)	6.3	6.9	
	16:00	17:00	(<11)	0.8	6.3	7.1	
	17:00	18:00	(<11)	0.9	7.9	8.8	
	18:00	19:00	(<11)	(<0.8)	51.9	52.1	
	19:00	20:00	(<11)	(<0.8)	46.4	46.6	
	20:00	21:00	(<11)	(<0.8)	50.2	50.5	
	21:00	22:00	(<11)	(<0.8)	46.5	46.8	
	22:00	23:00	(<11)	(<0.8)	51.3	51.6	
	23:00	0:00	(<11)	(<0.8)	50.8	51.0	
11/02/2007	0:00	1:00	(<11)	0.9	59.0	59.9	

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/02/2007	1:00	2:00	(<11)	(<0.8)	58.7	59.2	
	2:00	3:00	(<11)	(<0.8)	50.5	50.8	
	3:00	4:00	(<11)	(<0.8)	49.0	49.3	
	4:00	5:00	(<11)	(<0.8)	47.8	48.1	
	5:00	6:00	(<11)	(<0.8)	47.0	47.3	
	6:00	7:00	(<11)	(<0.8)	48.1	48.4	
	7:00	8:00	(<11)	1.4	62.1	63.5	
	8:00	9:00	(<11)	(<0.8)	59.0	59.6	
	9:00	10:00	(<11)	(<0.8)	41.2	41.5	
	10:00	11:00	(<11)	(<0.8)	40.0	40.4	(<46)
	11:00	12:00	(<11)	4.8	49.0	53.8	(<46)
	12:00	13:00	(<11)	4.6	48.1	52.8	(<46)
	13:00	14:00	(<11)	4.2	45.5	49.7	(<46)
	14:00	15:00	(<11)	3.0	45.1	48.2	(<46)
	15:00	16:00	(<11)	2.9	37.8	40.7	(<46)
	16:00	17:00	(<11)	6.8	35.7	42.4	(<46)
	17:00	18:00	(<11)	2.4	44.3	46.8	(<46)
	18:00	19:00	(<11)	2.1	47.1	49.2	(<46)
	19:00	20:00	(<11)	2.1	47.1	49.2	(<46)
	20:00	21:00	(<11)	1.8	46.0	47.8	(<46)
	21:00	22:00	(<11)	2.0	51.2	53.2	51.2
	22:00	23:00	(<11)	2.0	44.8	46.8	(<46)
	23:00	0:00	(<11)	2.0	47.6	49.6	(<46)
11/03/2007	0:00	1:00	(<11)	2.1	45.4	47.5	(<46)
	1:00	2:00	(<11)	1.8	43.1	44.9	(<46)
	2:00	3:00	(<11)	1.8	45.1	47.0	(<46)
	3:00	4:00	(<11)	1.7	43.8	45.5	(<46)
	4:00	5:00	(<11)	1.9	45.7	47.7	(<46)
	5:00	6:00	(<11)	1.8	45.7	47.5	(<46)
	6:00	7:00	(<11)	2.2	43.5	45.7	(<46)
	7:00	8:00	(<11)	1.3	43.8	45.1	(<46)
	8:00	9:00	(<11)	1.6	51.8	53.4	(<46)
	9:00	10:00	(<11)	2.4	40.3	42.7	(<46)
	10:00	11:00	(<11)	4.1	38.0	42.1	(<46)
	11:00	12:00	(<11)	5.4	35.0	40.4	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/03/2007	12:00	13:00	(<11)	4.8	36.6	41.4	(<46)
	13:00	14:00	(<11)	6.5	44.4	50.9	(<46)
	14:00	15:00	(<11)	2.2	43.4	45.6	(<46)
	15:00	16:00	(<11)	2.0	35.3	37.4	(<46)
	16:00	17:00	(<11)	7.7	53.5	61.1	(<46)
	17:00	18:00	(<11)	2.3	45.3	47.6	(<46)
	18:00	19:00	(<11)	2.1	42.7	44.7	(<46)
	19:00	20:00	(<11)	2.0	46.5	48.5	(<46)
	20:00	21:00	(<11)	2.1	47.4	49.5	(<46)
	21:00	22:00	(<11)	2.1	49.8	52.0	(<46)
	22:00	23:00	(<11)	1.9	46.6	48.5	(<46)
	23:00	0:00	(<11)	2.1	42.5	44.6	(<46)
11/04/2007	0:00	1:00	(<11)	2.0	46.9	48.9	(<46)
	1:00	2:00	(<11)	2.0	46.5	48.5	(<46)
	2:00	3:00	(<11)	2.1	50.0	52.2	(<46)
	3:00	4:00	(<11)	2.1	50.0	52.1	(<46)
	4:00	5:00	(<11)	2.1	46.5	48.6	(<46)
	5:00	6:00	(<11)	2.9	46.2	49.1	(<46)
	6:00	7:00	(<11)	1.9	44.6	46.5	(<46)
	7:00	8:00	(<11)	2.4	45.7	48.0	(<46)
	8:00	9:00	(<11)	4.0	52.8	56.8	(<46)
	9:00	10:00	(<11)	3.4	53.6	57	(<46)
	10:00	11:00	(<11)	-	-	-	(<46)
	11:00	12:00	(<11)	5.6	35.1	40.7	(<46)
	12:00	13:00	(<11)	4.4	37.5	41.8	(<46)
	13:00	14:00	(<11)	6.1	45.5	51.6	(<46)
	14:00	15:00	(<11)	2.4	43.3	45.8	70.6
	15:00	16:00	(<11)	2.0	42.2	44.2	(<46)
	16:00	17:00	(<11)	7.7	64.5	72.3	(<46)
	17:00	18:00	(<11)	2.2	46.6	48.9	(<46)
	18:00	19:00	(<11)	2.0	44.0	46.0	(<46)
	19:00	20:00	(<11)	2.1	47.1	49.2	(<46)
	20:00	21:00	(<11)	2.1	48.8	50.9	(<46)
	21:00	22:00	(<11)	2.2	50.3	52.5	(<46)
	22:00	23:00	(<11)	2.0	47.1	49.1	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/04/2007	23:00	0:00	(<11)	2.1	47.9	50.0	(<46)
11/05/2007	0:00	2:00	(<11)	2.0	41.8	43.8	(<46)
	1:00	3:00	(<11)	2.0	41.8	43.8	(<46)
	2:00	4:00	(<11)	2.0	43.8	45.8	(<46)
	3:00	5:00	(<11)	2.0	43.8	45.8	(<46)
	4:00	6:00	(<11)	2.1	44.4	46.5	(<46)
	5:00	6:00	(<11)	2.9	49.8	52.7	(<46)
	6:00	7:00	(<11)	2.2	43.4	45.6	(<46)
	7:00	8:00	(<11)	2.3	44.3	46.6	(<46)
	8:00	9:00	(<11)	4.5	60.2	64.7	(<46)
	9:00	10:00	(<11)	2.7	44.8	47.5	(<46)
	10:00	11:00	(<11)	2.5	26.9	29.4	(<46)
	11:00	12:00	(<11)	2.1	41.5	43.6	(<46)
	12:00	13:00	(<11)	2.5	45.8	48.3	(<46)
	13:00	14:00	(<11)	9.5	64.5	74.0	(<46)
	14:00	15:00	(<11)	30.4	98.9	129.2	72.9
	15:00	16:00	(<11)	13.3	67.5	80.8	(<46)
	16:00	17:00	(<11)	7.5	53.6	61.1	(<46)
	17:00	18:00	(<11)	2.2	50.5	52.7	(<46)
	18:00	19:00	(<11)	2.1	47.3	49.5	(<46)
	19:00	20:00	(<11)	1.9	38.9	40.8	(<46)
	20:00	21:00	(<11)	1.8	41.8	43.7	(<46)
	21:00	22:00	(<11)	1.8	42.6	44.4	(<46)
	22:00	23:00	(<11)	1.8	44.4	46.2	(<46)
	23:00	0:00	(<11)	1.8	46.1	47.9	51.8
11/06/2007	0:00	1:00	(<11)	2.4	28.7	31.1	(<46)
	1:00	2:00	(<11)	2.4	29.1	31.5	(<46)
	2:00	3:00	(<11)	2.4	28.9	31.3	(<46)
	3:00	4:00	(<11)	3.0	29.7	32.7	(<46)
	4:00	5:00	(<11)	3.2	32.7	35.9	(<46)
	5:00	6:00	(<11)	2.4	30.1	32.5	(<46)
	6:00	7:00	(<11)	2.9	31.0	33.9	(<46)
	7:00	8:00	(<11)	6.1	40.7	46.8	(<46)
	8:00	9:00	(<11)	2.7	28.5	31.3	(<46)
	9:00	10:00	(<11)	2.4	22.7	25.0	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/06/2007	10:00	11:00	(<11)	6.7	20.5	27.2	(<46)
	11:00	12:00	(<11)	2.7	21.0	23.7	(<46)
	12:00	13:00	(<11)	2.8	31.0	33.8	(<46)
	13:00	14:00	(<11)	2.6	31.9	34.5	(<46)
	14:00	15:00	(<11)	2.3	29.5	31.8	(<46)
	15:00	16:00	(<11)	2.5	31.4	34.0	(<46)
	16:00	17:00	(<11)	2.4	33.2	35.6	(<46)
	17:00	18:00	(<11)	2.2	28.8	31.0	(<46)
	18:00	19:00	(<11)	2.1	29.6	31.7	(<46)
	19:00	20:00	(<11)	2.0	27.8	29.8	(<46)
	20:00	21:00	(<11)	2.3	31.4	33.6	(<46)
	21:00	22:00	(<11)	2.0	29.5	31.4	(<46)
	22:00	23:00	(<11)	1.9	27.6	29.5	(<46)
	23:00	0:00	(<11)	1.9	29.7	31.6	(<46)
11/07/2007	0:00	1:00	(<11)	1.9	29.4	31.3	(<46)
	1:00	2:00	(<11)	1.9	28.7	30.6	(<46)
	2:00	3:00	(<11)	2.0	30.0	32.1	(<46)
	3:00	4:00	(<11)	1.8	28.3	30.1	(<46)
	4:00	5:00	(<11)	1.9	29.0	30.9	(<46)
	5:00	6:00	(<11)	1.8	29.1	30.9	(<46)
	6:00	7:00	(<11)	2.5	32.4	34.9	68.5
	7:00	8:00	(<11)	2.7	36.4	39.1	57.9
	8:00	9:00	(<11)	2.2	23.8	26.0	(<46)
	9:00	10:00	(<11)	2.4	21.7	24.1	(<46)
	10:00	11:00	(<11)	-	-	-	(<46)
	11:00	12:00	(<11)	20.2	0.9	21.1	(<46)
	12:00	13:00	(<11)	20.7	1.0	21.8	(<46)
	13:00	14:00	(<11)	21.0	1.0	22.0	(<46)
	14:00	15:00	(<11)	20.9	0.9	21.8	(<46)
	15:00	16:00	(<11)	21.1	1.2	22.3	(<46)
	16:00	17:00	(<11)	22.1	1.6	23.8	(<46)
	17:00	18:00	(<11)	21.1	2.0	23.1	(<46)
	18:00	19:00	(<11)	21.6	2.6	24.2	(<46)
	19:00	20:00	(<11)	21.5	3.2	24.7	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/07/2007	20:00	21:00	(<11)	21.1	3.6	24.6	(<46)
	21:00	22:00	(<11)	20.9	3.9	24.8	(<46)
	22:00	23:00	(<11)	21.3	4.3	25.5	(<46)
11/08/2007	23:00	0:00	(<11)	20.6	4.5	25.1	(<46)
	0:00	1:00	(<11)	21.8	5.2	27.0	(<46)
	1:00	2:00	(<11)	20.4	5.7	26.1	(<46)
	2:00	3:00	(<11)	20.4	6.5	26.9	(<46)
	3:00	4:00	(<11)	20.3	7.5	27.8	(<46)
	4:00	5:00	(<11)	20.2	9.4	29.6	(<46)
	5:00	6:00	(<11)	20.2	12.5	32.7	(<46)
	6:00	7:00	(<11)	20.7	17.3	38.1	(<46)
	7:00	8:00	(<11)	21.4	24.3	45.8	(<46)
	8:00	9:00	(<11)	20.9	33.0	53.9	(<46)
	9:00	10:00	(<11)	20.9	45.0	65.8	(<46)
	10:00	11:00	(<11)	21.4	49.5	70.9	(<46)
	11:00	12:00	(<11)	25.1	(<0.5)	25.4	(<46)
	12:00	13:00	(<11)	30.4	(<0.5)	30.6	(<46)
	13:00	14:00	(<11)	19.6	(<0.5)	19.9	(<46)
	14:00	15:00	(<11)	18.8	(<0.5)	19.1	(<46)
	15:00	16:00	(<11)	18.8	(<0.5)	19.1	(<46)
	16:00	17:00	(<11)	18.9	(<0.5)	19.2	(<46)
	17:00	18:00	(<11)	18.8	(<0.5)	19.1	(<46)
	18:00	19:00	(<11)	19.8	(<0.5)	20.1	(<46)
	19:00	20:00	(<11)	19.5	(<0.5)	20.0	73.2
	20:00	21:00	(<11)	26.4	0.7	27.1	165.0
	21:00	22:00	(<11)	27.0	1.0	28.0	149.5
	22:00	23:00	(<11)	25.6	1.3	27.0	135.4
	23:00	0:00	(<11)	31.8	1.7	33.5	153.8
11/09/2007	0:00	1:00	(<11)	34.5	1.9	36.4	140.9
	1:00	2:00	(<11)	31.4	2.3	33.7	107.6
	2:00	3:00	(<11)	21.2	2.5	23.7	72.1
	3:00	4:00	(<11)	23.5	2.6	26.1	63.0
	4:00	5:00	(<11)	21.5	3.0	24.5	(<46)
	5:00	6:00	(<11)	20.1	3.4	23.4	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/09/2007	6:00	7:00	(<11)	19.7	3.6	23.3	(<46)
	7:00	8:00	(<11)	20.0	3.8	23.9	(<46)
	8:00	9:00	(<11)	19.6	4.8	24.4	(<46)
	9:00	10:00	(<11)	19.7	6.1	25.8	(<46)
	10:00	11:00	(<11)	18.6	1.5	20.1	(<46)
	11:00	12:00	(<11)	18.6	1.5	20.1	(<46)
	12:00	13:00	(<11)	18.6	1.6	20.2	(<46)
	13:00	14:00	(<11)	18.9	1.8	20.7	(<46)
	14:00	15:00	(<11)	18.7	1.6	20.3	(<46)
	15:00	16:00	(<11)	18.6	1.7	20.3	(<46)
	16:00	17:00	(<11)	18.7	2.0	20.7	(<46)
	17:00	18:00	(<11)	18.6	1.9	20.5	47.6
	18:00	19:00	(<11)	18.6	2.0	20.7	65.5
	19:00	20:00	(<11)	18.8	2.3	21.1	74.4
	20:00	21:00	(<11)	19.1	2.8	21.9	100.4
	21:00	22:00	(<11)	18.9	2.2	21.1	58.6
	22:00	23:00	(<11)	19.0	1.9	20.8	(<46)
	23:00	0:00	(<11)	19.3	2.4	21.7	65.1
11/10/2007	0:00	1:00	(<11)	19.2	1.9	21.1	(<46)
	1:00	2:00	(<11)	19.1	1.9	21.0	(<46)
	2:00	3:00	(<11)	19.2	1.9	21.1	(<46)
	3:00	4:00	(<11)	19.2	1.9	21.1	(<46)
	4:00	5:00	(<11)	19.4	2.0	21.4	(<46)
	5:00	6:00	(<11)	19.5	2.2	21.7	(<46)
	6:00	7:00	(<11)	20.7	2.6	23.4	(<46)
	7:00	8:00	(<11)	20.1	2.6	22.7	54.7
	8:00	9:00	(<11)	21.7	3.8	25.5	83.1
	9:00	10:00	(<11)	22.2	4.2	26.4	80.1
	10:00	11:00	(<11)	21.9	1.6	23.6	64.8
	11:00	12:00	(<11)	23.3	1.6	25.0	59.3
	12:00	13:00	(<11)	21.7	1.2	22.9	52.4
	13:00	14:00	(<11)	21.3	1.3	22.6	62.5
	14:00	15:00	(<11)	21.2	1.0	22.2	57.7
	15:00	16:00	(<11)	21.4	1.1	22.5	51.0

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/10/2007	16:00	17:00	(<11)	21.3	1.2	22.5	59.6
	17:00	18:00	(<11)	21.1	1.4	22.5	83.6
	18:00	19:00	(<11)	21.3	1.5	22.8	84.4
	19:00	20:00	(<11)	21.2	1.6	22.7	87.5
	20:00	21:00	(<11)	21.0	1.6	22.5	95.8
	21:00	22:00	(<11)	20.9	1.6	22.4	104.5
	22:00	23:00	(<11)	30.9	2.7	33.5	128.3
	23:00	0:00	(<11)	24.0	2.1	26.1	164.7
11/11/2007	0:00	1:00	(<11)	24.7	2.1	26.8	162.0
	1:00	2:00	(<11)	21.3	1.9	23.3	127.2
	2:00	3:00	(<11)	27.5	3.3	30.8	113.2
	3:00	4:00	(<11)	20.5	1.9	22.3	100.1
	4:00	5:00	(<11)	19.8	1.9	21.7	101.7
	5:00	6:00	(<11)	19.6	2.0	21.6	126.1
	6:00	7:00	(<11)	20.2	2.5	22.7	146.7
	7:00	8:00	(<11)	20.8	3.3	24.1	120.7
	8:00	9:00	(<11)	20.5	4.7	25.2	87.3
	9:00	10:00	(<11)	19.9	5.9	25.8	54.8
	10:00	11:00	(<11)	19.4	(<0.5)	19.8	(<46)
	11:00	12:00	(<11)	20.1	(<0.5)	20.4	(<46)
	12:00	13:00	(<11)	20.3	(<0.5)	20.7	(<46)
	13:00	14:00	(<11)	20.5	(<0.5)	20.9	(<46)
	14:00	15:00	(<11)	21.0	(<0.5)	21.4	(<46)
	15:00	16:00	(<11)	20.7	(<0.5)	21.0	(<46)
	16:00	17:00	(<11)	20.8	(<0.5)	21.1	50.8
	17:00	18:00	(<11)	20.9	0.5	21.4	62.2
	18:00	19:00	(<11)	20.9	0.7	21.6	64.2
	19:00	20:00	(<11)	20.9	0.9	21.8	57.7
	20:00	21:00	(<11)	20.9	1.0	21.9	56.9
	21:00	22:00	(<11)	20.7	1.1	21.8	53.7
	22:00	23:00	(<11)	20.4	1.2	21.7	52.9
	23:00	0:00	(<11)	20.1	1.3	21.4	57.7
11/12/2007	0:00	1:00	(<11)	21.3	1.3	22.6	61.7
	1:00	2:00	(<11)	21.0	1.1	22.1	80.1

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/12/2007	2:00	3:00	(<11)	20.2	1.1	21.3	87.3
	3:00	4:00	(<11)	22.1	0.9	23.0	96.5
	4:00	5:00	(<11)	19.3	1.5	20.8	96.3
	5:00	6:00	(<11)	20.0	1.7	21.8	111.3
	6:00	7:00	(<11)	30.8	2.1	32.9	149.2
	7:00	8:00	(<11)	24.8	2.9	27.8	138.7
	8:00	9:00	(<11)	22.8	3.2	25.9	83.7
	9:00	10:00	(<11)	21.4	3.6	25.0	(<46)
	10:00	11:00	(<11)	22.0	4.9	26.9	(<46)
	11:00	12:00	(<11)	22.3	6.8	29.1	(<46)
	12:00	13:00	(<11)	20.4	9.3	29.7	(<46)
	13:00	14:00	(<11)	21.4	11.8	33.3	(<46)
	14:00	15:00	(<11)	21.4	14.8	36.2	(<46)
	15:00	16:00	(<11)	21.1	15.7	36.8	(<46)
	16:00	17:00	(<11)	18.9	(<0.5)	19.1	(<46)
	17:00	18:00	(<11)	18.6	(<0.5)	18.8	(<46)
	18:00	19:00	(<11)	18.5	(<0.5)	18.7	50.2
	19:00	20:00	(<11)	18.5	(<0.5)	18.7	(<46)
	20:00	21:00	(<11)	18.4	(<0.5)	18.5	52.1
	21:00	22:00	(<11)	18.4	(<0.5)	18.6	(<46)
	22:00	23:00	(<11)	18.5	(<0.5)	18.7	53.0
	23:00	0:00	(<11)	18.7	(<0.5)	18.9	65.9
11/13/2007	0:00	1:00	(<11)	18.4	(<0.5)	18.6	74.3
	1:00	2:00	(<11)	18.3	(<0.5)	18.5	66.0
	2:00	3:00	(<11)	18.4	(<0.5)	18.6	65.9
	3:00	4:00	(<11)	18.3	(<0.5)	18.5	75.7
	4:00	5:00	(<11)	18.7	(<0.5)	19.1	71.7
	5:00	6:00	(<11)	18.2	(<0.5)	18.6	75.2
	6:00	7:00	(<11)	18.5	0.7	19.1	82.5
	7:00	8:00	(<11)	20.7	1.1	21.8	90.3
	8:00	9:00	(<11)	20.1	1.3	21.4	52.6
	9:00	10:00	(<11)	21.4	1.7	23.1	47.0
	10:00	11:00	(<11)	-	-	-	(<46)
	11:00	12:00	(<11)	19.4	(<0.5)	19.8	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO2	NO	NO_x	CO
11/13/2007	12:00	13:00	(<11)	19.3	(<0.5)	19.7	(<46)
	13:00	14:00	(<11)	47.1	0.6	47.7	(<46)
	14:00	15:00	(<11)	39.8	2.3	42.1	(<46)
	15:00	16:00	(<11)	51.1	2.8	54.0	(<46)
	16:00	17:00	(<11)	33.3	3.7	36.9	54.3
	17:00	18:00	(<11)	19.7	2.3	21.9	(<46)
	18:00	19:00	(<11)	19.4	2.7	22.1	(<46)
	19:00	20:00	(<11)	19.3	2.7	22.0	54.8
	20:00	21:00	(<11)	19.4	2.6	22.1	61.2
	21:00	22:00	(<11)	19.8	2.6	22.5	59.6
	22:00	23:00	(<11)	20.1	2.5	22.6	50.3
	23:00	0:00	(<11)	20.2	2.5	22.7	50.8
11/14/2007	0:00	1:00	(<11)	20.3	2.5	22.8	52.0
	1:00	2:00	(<11)	20.3	2.4	22.7	56.1
	2:00	3:00	(<11)	20.7	2.7	23.4	61.3
	3:00	4:00	(<11)	20.5	2.6	23.1	70.6
	4:00	5:00	(<11)	20.6	2.5	23.1	79.1
	5:00	6:00	(<11)	20.9	2.7	23.6	87.6
	6:00	7:00	(<11)	23.5	3.2	26.8	104.4
	7:00	8:00	(<11)	24.7	4.0	28.7	93.3
	8:00	9:00	(<11)	22.6	3.3	25.9	(<46)
	9:00	10:00	(<11)	28.7	4.7	33.4	(<46)
	10:00	11:00	(<11)	21.6	2.0	23.6	(<46)
	11:00	12:00	(<11)	20.6	1.1	21.7	(<46)
	12:00	13:00	(<11)	19.4	0.4	19.8	(<46)
	13:00	14:00	(<11)	19.3	0.4	19.7	(<46)
	14:00	15:00	(<11)	47.1	0.6	47.7	(<46)
	15:00	16:00	(<11)	39.8	2.3	42.1	(<46)
	16:00	17:00	(<11)	51.1	2.8	54.0	(<46)
	17:00	18:00	(<11)	33.3	3.7	36.9	(<46)
	18:00	19:00	(<11)	19.7	2.3	21.9	(<46)
	19:00	20:00	(<11)	19.4	2.7	22.1	(<46)
	20:00	21:00	(<11)	19.3	2.7	22.0	(<46)
	21:00	22:00	(<11)	19.4	2.6	22.1	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/14/2007	22:00	23:00	(<11)	19.8	2.6	22.5	(<46)
	23:00	0:00	(<11)	20.1	2.5	22.6	(<46)
11/15/2007	0:00	1:00	(<11)	20.2	2.5	22.7	(<46)
	1:00	2:00	(<11)	20.3	2.5	22.8	(<46)
	2:00	3:00	(<11)	20.3	2.4	22.7	(<46)
	3:00	4:00	(<11)	20.7	2.7	23.4	(<46)
	4:00	5:00	(<11)	20.5	2.6	23.1	(<46)
	5:00	6:00	(<11)	20.6	2.5	23.1	(<46)
	6:00	7:00	(<11)	20.9	2.7	23.6	(<46)
	7:00	8:00	(<11)	23.5	3.2	26.8	(<46)
	8:00	9:00	(<11)	24.7	4.0	28.7	(<46)
	9:00	10:00	(<11)	22.6	3.3	25.9	(<46)
	10:00	11:00	(<11)	28.7	4.7	33.4	(<46)
	11:00	12:00	(<11)	21.6	2.0	23.6	(<46)
	12:00	13:00	(<11)	19.7	(<0.5)	19.6	(<46)
	13:00	14:00	(<11)	21.9	(<0.5)	21.9	(<46)
	14:00	15:00	(<11)	26.7	0.6	27.3	(<46)
	15:00	16:00	(<11)	21.5	(<0.5)	21.7	(<46)
	16:00	17:00	(<11)	18.9	(<0.5)	19.0	54.8
	17:00	18:00	(<11)	18.6	(<0.5)	18.7	49.9
	18:00	19:00	(<11)	19.7	(<0.5)	19.9	(<46)
	19:00	20:00	(<11)	19.8	(<0.5)	20.1	(<46)
	20:00	21:00	(<11)	19.0	(<0.5)	19.3	(<46)
	21:00	22:00	(<11)	23.5	(<0.5)	23.9	(<46)
	22:00	23:00	(<11)	21.4	(<0.5)	21.7	(<46)
	23:00	0:00	(<11)	19.8	(<0.5)	20.1	57.6
11/16/2007	0:00	1:00	(<11)	21.4	0.5	22.0	57.9
	1:00	2:00	(<11)	18.3	0.5	18.8	48.6
	2:00	3:00	(<11)	18.4	0.5	18.9	(<46)
	3:00	4:00	(<11)	22.5	0.9	23.4	(<46)
	4:00	5:00	(<11)	18.5	0.6	19.1	(<46)
	5:00	6:00	(<11)	18.7	0.7	19.4	47.98
	6:00	7:00	(<11)	18.3	0.7	19.1	60.09
	7:00	8:00	(<11)	18.6	1.0	19.6	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/16/2007	8:00	9:00	(<11)	19.4	1.1	20.5	(<46)
	9:00	10:00	(<11)	19.6	1.1	20.7	(<46)
	10:00	11:00	(<11)	19.5	(<0.5)	19.9	(<46)
	11:00	12:00	(<11)	19.8	(<0.5)	20.0	(<46)
	12:00	13:00	(<11)	19.2	(<0.5)	19.4	(<46)
	13:00	14:00	(<11)	19.9	(<0.5)	20.1	(<46)
	14:00	15:00	(<11)	19.1	(<0.5)	19.3	(<46)
	15:00	16:00	(<11)	20.2	(<0.5)	20.4	(<46)
	16:00	17:00	(<11)	20.2	(<0.5)	20.4	(<46)
	17:00	18:00	(<11)	20.0	(<0.5)	20.2	47.2
	18:00	19:00	(<11)	18.8	(<0.5)	19.1	53.7
	19:00	20:00	(<11)	18.8	(<0.5)	19.1	73.8
	20:00	21:00	(<11)	18.8	0.5	19.3	126.4
	21:00	22:00	(<11)	19.0	0.7	19.6	165.4
	22:00	23:00	(<11)	18.6	0.8	19.5	159.7
	23:00	0:00	(<11)	26.4	0.7	27.1	93.8
11/17/2007	0:00	1:00	(<11)	19.3	0.9	20.3	87.5
	1:00	2:00	(<11)	18.6	1.3	19.9	81.8
	2:00	3:00	(<11)	18.6	1.5	20.1	79.8
	3:00	4:00	(<11)	18.6	1.7	20.4	83.1
	4:00	5:00	(<11)	18.6	1.8	20.4	80.8
	5:00	6:00	(<11)	18.7	2.0	20.7	71.9
	6:00	7:00	(<11)	19.0	2.3	21.3	81.3
	7:00	8:00	(<11)	20.1	2.9	23.0	140.7
	8:00	9:00	(<11)	19.6	3.5	23.1	119.8
	9:00	10:00	(<11)	19.3	4.0	23.3	138.6
	10:00	11:00	(<11)	24.8	0.5	25.3	102.7
	11:00	12:00	(<11)	26.4	(<0.5)	25.2	77.6
	12:00	13:00	(<11)	20.0	(<0.5)	20.2	64.0
	13:00	14:00	(<11)	20.6	(<0.5)	20.8	89.9
	14:00	15:00	(<11)	20.6	(<0.5)	20.9	113.8
	15:00	16:00	(<11)	21.1	(<0.5)	21.4	90.2
	16:00	17:00	(<11)	19.4	(<0.5)	19.7	75.2
	17:00	18:00	(<11)	18.8	(<0.5)	19.0	72.7

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/17/2007	18:00	19:00	(<11)	19.1	(<0.5)	19.5	117.4
	19:00	20:00	(<11)	21.0	(<0.5)	21.4	162.3
	20:00	21:00	(<11)	18.4	(<0.5)	18.7	96.2
	21:00	22:00	(<11)	18.5	(<0.5)	18.8	75.0
	22:00	23:00	(<11)	18.9	(<0.5)	19.2	65.2
	23:00	0:00	(<11)	18.3	0.5	18.8	62.1
11/18/2007	0:00	1:00	(<11)	18.5	0.5	19.0	80.2
	1:00	2:00	(<11)	18.3	0.7	19.0	99.8
	2:00	3:00	(<11)	18.2	0.8	19.1	98.2
	3:00	4:00	(<11)	18.2	1.0	19.2	101.1
	4:00	5:00	(<11)	18.3	1.1	19.4	110.7
	5:00	6:00	(<11)	18.3	1.1	19.4	109.6
	6:00	7:00	(<11)	18.3	1.2	19.6	89.5
	7:00	8:00	(<11)	18.8	1.4	20.2	59.4
	8:00	9:00	(<11)	18.7	1.3	20.0	(<46)
	9:00	10:00	(<11)	18.5	0.1	18.6	204.7
	10:00	11:00	(<11)	19.4	(<0.5)	19.5	195.4
	11:00	12:00	(<11)	18.7	(<0.5)	18.8	189.1
	12:00	13:00	(<11)	18.9	(<0.5)	19.1	200.1
	13:00	14:00	(<11)	18.7	(<0.5)	18.8	191.7
	14:00	15:00	(<11)	18.8	(<0.5)	18.9	173.1
	15:00	16:00	(<11)	18.8	(<0.5)	18.9	178.1
	16:00	17:00	(<11)	18.7	(<0.5)	18.8	190.5
	17:00	18:00	(<11)	18.8	(<0.5)	19.0	202.2
	18:00	19:00	(<11)	19.0	(<0.5)	19.2	203.5
	19:00	20:00	(<11)	18.7	(<0.5)	19.0	212.3
	20:00	21:00	(<11)	20.9	(<0.5)	21.3	274.7
	21:00	22:00	(<11)	19.2	(<0.5)	19.6	321.3
	22:00	23:00	(<11)	19.1	0.5	19.6	326.4
	23:00	0:00	(<11)	19.2	0.6	19.8	335.0
11/19/2007	0:00	1:00	(<11)	18.6	0.6	19.2	295.4
	1:00	2:00	(<11)	18.4	0.6	19.0	268.1
	2:00	3:00	(<11)	18.7	0.6	19.4	270.2
	3:00	4:00	(<11)	18.4	0.7	19.1	268.9

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/19/2007	4:00	5:00	(<11)	18.7	0.6	19.3	277.6
	5:00	6:00	(<11)	18.2	0.7	19.0	279.8
	6:00	7:00	(<11)	19.7	1.0	20.8	298.5
	7:00	8:00	(<11)	22.6	1.3	23.9	298.6
	8:00	9:00	(<11)	19.7	0.7	20.5	232.6
	9:00	10:00	(<11)	20.6	(<0.5)	20.7	212.0
	10:00	11:00	(<11)	25.6	(<0.5)	25.8	207.3
	11:00	12:00	(<11)	32.1	(<0.5)	32.0	191.0
	12:00	13:00	(<11)	19.2	(<0.5)	19.3	170.0
	13:00	14:00	(<11)	18.8	(<0.5)	18.9	156.1
	14:00	15:00	(<11)	22.3	(<0.5)	22.5	162.9
	15:00	16:00	(<11)	19.7	(<0.5)	19.8	180.4
	16:00	17:00	(<11)	20.3	(<0.5)	20.4	217.9
	17:00	18:00	(<11)	19.0	(<0.5)	19.2	249.6
	18:00	19:00	(<11)	18.6	(<0.5)	18.9	262.0
	19:00	20:00	(<11)	18.4	(<0.5)	18.6	268.1
	20:00	21:00	(<11)	18.3	(<0.5)	18.6	278.1
	21:00	22:00	(<11)	18.2	(<0.5)	18.6	282.9
	22:00	23:00	(<11)	18.3	0.6	18.9	310.0
	23:00	0:00	(<11)	46.4	(<0.5)	46.1	328.7
11/20/2007	0:00	1:00	(<11)	27.6	2.1	29.7	333.9
	1:00	2:00	(<11)	18.8	0.7	19.6	317.1
	2:00	3:00	(<11)	18.6	0.9	19.6	317.5
	3:00	4:00	(<11)	19.0	1.0	20.0	317.5
	4:00	5:00	(<11)	18.1	1.0	19.1	317.7
	5:00	6:00	(<11)	18.1	1.2	19.3	319.0
	6:00	7:00	(<11)	20.3	1.8	22.1	340.7
	7:00	8:00	(<11)	23.6	2.2	25.7	312.0
	8:00	9:00	(<11)	23.9	2.3	26.2	277.4
	9:00	10:00	(<11)	19.2	3.4	22.6	247.0
	10:00	11:00	(<11)	19.7	1.6	21.4	(<46)
	11:00	12:00	(<11)	21.0	1.8	22.8	(<46)
	12:00	13:00	(<11)	19.6	1.7	21.3	(<46)
	13:00	14:00	(<11)	19.3	1.6	20.8	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/20/2007	14:00	15:00	(<11)	19.8	1.7	21.5	(<46)
	15:00	16:00	(<11)	71.7	0.5	72.2	103.7
	16:00	17:00	(<11)	19.2	2.9	22.1	111.1
	17:00	18:00	(<11)	18.2	3.4	21.5	155.5
	18:00	19:00	(<11)	18.7	3.5	22.2	179.6
	19:00	20:00	(<11)	18.3	1.9	20.3	147.5
	20:00	21:00	(<11)	18.2	1.7	19.9	114.7
	21:00	22:00	(<11)	18.4	1.9	20.3	113.5
	22:00	23:00	(<11)	22.6	4.0	26.6	153.1
	23:00	0:00	(<11)	19.1	2.9	22.0	137.6
11/21/2007	0:00	1:00	(<11)	18.7	2.6	21.3	125.5
	1:00	2:00	(<11)	18.8	1.6	20.4	101.5
	2:00	3:00	(<11)	19.7	2.1	21.7	97.2
	3:00	4:00	(<11)	19.8	2.4	22.3	98.1
	4:00	5:00	(<11)	20.7	3.7	24.5	107.5
	5:00	6:00	(<11)	24.1	5.6	29.6	128.9
	6:00	7:00	(<11)	28.8	5.8	34.6	153.1
	7:00	8:00	(<11)	22.5	3.2	25.7	101.7
	8:00	9:00	(<11)	22.8	2.6	25.4	72.9
	9:00	10:00	(<11)	22.6	2.3	24.9	53.9
	10:00	11:00	(<11)	22.3	2.1	24.4	(<46)
	11:00	12:00	(<11)	22.3	2.1	24.4	(<46)
	12:00	13:00	(<11)	23.0	2.3	25.4	126.4
	13:00	14:00	(<11)	23.5	1.8	25.3	(<46)
	14:00	15:00	(<11)	29.8	1.6	31.4	(<46)
	15:00	16:00	(<11)	26.4	1.7	28.0	78.2
	16:00	17:00	(<11)	28.2	2.2	30.4	81.3
	17:00	18:00	(<11)	26.5	2.1	28.6	82.3
	18:00	19:00	(<11)	25.8	2.4	28.2	91.7
	19:00	20:00	(<11)	25.3	2.3	27.5	81.1
	20:00	21:00	(<11)	26.1	2.1	28.2	76.2
	21:00	22:00	(<11)	25.3	2.5	27.8	78.9
	22:00	23:00	(<11)	25.8	2.2	28.0	76.1
	23:00	0:00	(<11)	23.7	2.4	26.1	63.4

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/22/2007	0:00	1:00	(<11)	26.8	3.4	30.3	98.4
	1:00	2:00	(<11)	25.6	3.3	28.9	99.1
	2:00	3:00	(<11)	23.1	2.2	25.3	60.3
	3:00	4:00	(<11)	22.4	1.8	24.2	51.2
	4:00	5:00	(<11)	22.1	2.1	24.1	51.3
	5:00	6:00	(<11)	22.1	2.4	24.5	51.0
	6:00	7:00	(<11)	23.0	2.7	25.7	64.6
	7:00	8:00	(<11)	33.8	4.0	37.8	106.2
	8:00	9:00	(<11)	26.0	2.9	28.9	63.3
	9:00	10:00	(<11)	20.0	0.7	20.7	61.4
	10:00	11:00	(<11)	21.4	(<0.5)	21.8	48.1
	11:00	12:00	(<11)	19.1	(<0.5)	19.5	(<46)
	12:00	13:00	(<11)	19.0	(<0.5)	19.3	(<46)
	13:00	14:00	(<11)	19.8	(<0.5)	20.2	(<46)
	14:00	15:00	(<11)	19.0	(<0.5)	19.4	(<46)
	15:00	16:00	(<11)	19.5	(<0.5)	19.9	(<46)
	16:00	17:00	(<11)	19.0	(<0.5)	19.4	(<46)
	17:00	18:00	(<11)	19.4	0.6	19.9	60.9
	18:00	19:00	(<11)	19.4	0.6	20.0	92.5
	19:00	20:00	(<11)	19.3	0.8	20.0	89.8
	20:00	21:00	(<11)	20.3	0.9	21.2	94.1
	21:00	22:00	(<11)	19.2	1.0	20.2	100.1
	22:00	23:00	(<11)	18.8	1.1	19.9	77.4
	23:00	0:00	(<11)	18.8	1.1	19.9	66.1
11/23/2007	0:00	1:00	(<11)	18.7	1.2	19.9	66.3
	1:00	2:00	(<11)	23.7	2.8	26.5	70.3
	2:00	3:00	(<11)	18.8	1.4	20.2	70.0
	3:00	4:00	(<11)	18.7	1.5	20.2	57.6
	4:00	5:00	(<11)	18.6	1.6	20.3	61.7
	5:00	6:00	(<11)	18.7	1.8	20.5	67.0
	6:00	7:00	(<11)	25.8	2.6	28.4	103.6
	7:00	8:00	(<11)	31.9	3.2	35.1	158.2
	8:00	9:00	(<11)	25.4	3.2	28.6	124.0
	9:00	10:00	(<11)	-	-	-	(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/23/2007	10:00	11:00	(<11)	19.8	4.0	23.8	(<46)
	11:00	12:00	(<11)	19.7	4.9	24.5	(<46)
	12:00	13:00	(<11)	19.6	6.2	25.8	(<46)
	13:00	14:00	(<11)	20.5	8.0	28.6	(<46)
	14:00	15:00	(<11)	20.2	9.0	29.2	(<46)
	15:00	16:00	(<11)	20.4	10.4	30.7	(<46)
	16:00	17:00	(<11)	20.3	10.5	30.8	(<46)
	17:00	18:00	(<11)	19.5	10.5	30.0	(<46)
	18:00	19:00	(<11)	19.6	11.2	30.9	(<46)
	19:00	20:00	(<11)	19.5	12.3	31.9	(<46)
	20:00	21:00	(<11)	22.6	13.4	36.0	(<46)
	21:00	22:00	(<11)	24.7	14.0	38.6	(<46)
	22:00	23:00	(<11)	24.4	14.8	39.1	(<46)
	23:00	0:00	(<11)	20.8	14.9	35.7	(<46)
11/24/2007	0:00	1:00	(<11)	20.6	14.0	34.6	(<46)
	1:00	2:00	(<11)	20.9	11.9	32.7	(<46)
	2:00	3:00	(<11)	21.1	9.4	30.5	(<46)
	3:00	4:00	(<11)	21.3	7.4	28.7	(<46)
	4:00	5:00	(<11)	21.4	6.4	27.8	(<46)
	5:00	6:00	(<11)	21.6	5.6	27.2	(<46)
	6:00	7:00	(<11)	22.7	5.1	27.8	(<46)
	7:00	8:00	(<11)	23.1	4.6	27.7	(<46)
	8:00	9:00	(<11)	22.7	4.6	27.3	(<46)
	9:00	10:00	(<11)	22.2	4.8	27.0	(<46)
	10:00	11:00	(<11)	22.5	4.6	27.0	(<46)
	11:00	12:00	(<11)	21.7	2.3	24.0	(<46)
	12:00	13:00	(<11)	21.1	1.1	22.2	(<46)
	13:00	14:00	(<11)	21.5	1.3	22.8	(<46)
	14:00	15:00	(<11)	21.6	1.3	22.9	(<46)
	15:00	16:00	(<11)	21.6	1.2	22.9	(<46)
	16:00	17:00	(<11)	21.6	1.0	22.6	(<46)
	17:00	18:00	(<11)	21.7	1.2	22.9	(<46)
	18:00	19:00	(<11)	21.9	1.5	23.4	53.4
	19:00	20:00	(<11)	21.9	1.4	23.3	52.9

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	End	CL_2	NO_2	*NO*	NO_x	CO
11/24/2007	20:00	21:00	(<11)	21.8	1.3	23.1	(<46)
	21:00	22:00	(<11)	21.7	1.1	22.8	(<46)
	22:00	23:00	(<11)	21.6	1.1	22.7	(<46)
	23:00	0:00	(<11)	21.4	1.0	22.4	(<46)
11/25/2007	0:00	1:00	(<11)	21.3	1.0	22.3	(<46)
	1:00	2:00	(<11)	21.2	1.0	22.1	(<46)
	2:00	3:00	(<11)	21.1	0.8	21.9	(<46)
	3:00	4:00	(<11)	20.9	0.8	21.7	(<46)
	4:00	5:00	(<11)	20.8	0.7	21.6	(<46)
	5:00	6:00	(<11)	20.7	0.8	21.4	(<46)
	6:00	7:00	(<11)	20.6	0.8	21.4	(<46)
	7:00	8:00	(<11)	20.5	1.2	21.7	(<46)
	8:00	9:00	(<11)	20.5	1.2	21.7	(<46)
	9:00	10:00	(<11)	20.4	1.0	21.4	(<46)
	10:00	11:00	(<11)	20.7	1.3	22.0	(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					(<46)
	16:00	17:00					(<46)
	17:00	18:00					(<46)
	18:00	19:00					(<46)
	19:00	20:00					(<46)
	20:00	21:00					(<46)
	21:00	22:00					(<46)
	22:00	23:00					(<46)
	23:00	0:00					(<46)
11/26/2007	0:00	1:00					(<46)
	1:00	2:00					(<46)
	2:00	3:00					(<46)
	3:00	4:00					(<46)
	4:00	5:00					(<46)
	5:00	6:00					(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	*End*	CL_2	NO_2	*NO*	NO_x	CO
11/26/2007	6:00	7:00					(<46)
	7:00	8:00					47.2
	8:00	9:00					125.5
	9:00	10:00					(<46)
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					(<46)
	16:00	17:00					(<46)
	17:00	18:00					(<46)
	18:00	19:00					(<46)
	19:00	20:00					(<46)
	20:00	21:00					(<46)
	21:00	22:00					(<46)
	22:00	23:00					(<46)
	23:00	0:00					52.5
11/27/2007	0:00	1:00					60.0
	1:00	2:00					(<46)
	2:00	3:00					(<46)
	3:00	4:00					(<46)
	4:00	5:00					(<46)
	5:00	6:00					(<46)
	6:00	7:00					(<46)
	7:00	8:00					(<46)
	8:00	9:00					125.5
	9:00	10:00					47.7
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	*End*	CL_2	NO_2	*NO*	NO_x	CO
11/27/2007	16:00	17:00					(<46)
	17:00	18:00					(<46)
	18:00	19:00					(<46)
	19:00	20:00					75.1
	20:00	21:00					96.8
	21:00	22:00					89.7
	22:00	23:00					51.5
	23:00	0:00					(<46)
11/28/2007	0:00	1:00					(<46)
	1:00	2:00					(<46)
	2:00	3:00					(<46)
	3:00	4:00					(<46)
	4:00	5:00					(<46)
	5:00	6:00					46.7
	6:00	7:00					55.0
	7:00	8:00					79.8
	8:00	9:00					81.8
	9:00	10:00					80.4
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					(<46)
	16:00	17:00					(<46)
	17:00	18:00					(<46)
	18:00	19:00					56.2
	19:00	20:00					101.5
	20:00	21:00					106.2
	21:00	22:00					74.3
	22:00	23:00					92.7
	23:00	0:00					114.1
11/29/2007	0:00	1:00					124.8
	1:00	2:00					133.9

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	*End*	CL_2	NO_2	*NO*	NO_x	CO
11/29/2007	2:00	3:00					105.6
	3:00	4:00					107.8
	4:00	5:00					100.8
	5:00	6:00					97.8
	6:00	7:00					117.4
	7:00	8:00					172.6
	8:00	9:00					149.5
	9:00	10:00					(<46)
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					(<46)
	16:00	17:00					(<46)
	17:00	18:00					(<46)
	18:00	19:00					55.4
	19:00	20:00					85.5
	20:00	21:00					76.9
	21:00	22:00					87.3
	22:00	23:00					63.0
	23:00	0:00					41.9
11/30/2007	0:00	1:00					59.4
	1:00	2:00					67.9
	2:00	3:00					73.8
	3:00	4:00					60.5
	4:00	5:00					65.6
	5:00	6:00					74.7
	6:00	7:00					86.2
	7:00	8:00					142.6
	8:00	9:00					(<46)
	9:00	10:00					(<46)
	10:00	11:00					(<46)
	11:00	12:00					(<46)

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	*End*	CL_2	NO_2	*NO*	NO_x	CO
11/30/2007	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					(<46)
	16:00	17:00					(<46)
	17:00	18:00					(<46)
	18:00	19:00					(<46)
	19:00	20:00					83.1
	20:00	21:00					83.0
	21:00	22:00					55.5
	22:00	23:00					50.9
	23:00	0:00					47.7
12/01/2007	0:00	1:00					47.9
	1:00	2:00					48.4
	2:00	3:00					55.7
	3:00	4:00					93.9
	4:00	5:00					98.7
	5:00	6:00					125.5
	6:00	7:00					106.6
	7:00	8:00					94.2
	8:00	9:00					62.6
	9:00	10:00					(<46)
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)
	14:00	15:00					(<46)
	15:00	16:00					72.6
	16:00	17:00					47.8
	17:00	18:00					46.1
	18:00	19:00					56.8
	19:00	20:00					103.3
	20:00	21:00					119.3
	21:00	22:00					109.2

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	*End*	CL_2	NO_2	*NO*	NO_x	CO
12/01/2007	22:00	23:00					126.3
	23:00	0:00					88.0
12/02/2007	0:00	1:00					89.5
	1:00	2:00					96.2
	2:00	3:00					90.8
	3:00	4:00					101.4
	4:00	5:00					135.6
	5:00	6:00					152.4
	6:00	7:00					154.8
	7:00	8:00					120.1
	8:00	9:00					51.8
	9:00	10:00					(<46)
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					167.3
	13:00	14:00					415.5
	14:00	15:00					326.5
	15:00	16:00					(<46)
	16:00	17:00					(<46)
	17:00	18:00					56.2
	18:00	19:00					(<46)
	19:00	20:00					(<46)
	20:00	21:00					50.7
	21:00	22:00					49.6
	22:00	23:00					(<46)
	23:00	0:00					(<46)
12/03/2007	0:00	1:00					(<46)
	1:00	2:00					69.2
	2:00	3:00					64.9
	3:00	4:00					(<46)
	4:00	5:00					(<46)
	5:00	6:00					(<46)
	6:00	7:00					103.0
	7:00	8:00					159.8

Table 3: Ambient air quality testing results Cl_2, NO_2, NO, NO_x, & CO (cont'd)

Sampling	Sampling Period		1-Hr Conc. (µg/m^3)				
Date/ 2007	Start	*End*	CL_2	NO_2	*NO*	NO_x	CO
12/03/2007	8:00	9:00					88.7
	9:00	10:00					(<46)
	10:00	11:00					(<46)
	11:00	12:00					(<46)
	12:00	13:00					(<46)
	13:00	14:00					(<46)

Appendix II

Raw Data
PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL

Table 4.0: Ambient air quality testing results, PM_{10}, $PM_{2.5}$, TSP, SO_2, & HCL

Sample Period/ 2007				Parameter Concentration (24-hr Average) [1]				
From		To		TSP ($\mu g/Nm^3$)	PM_{10} ($\mu g/Nm^3$)	$PM_{2.5}$ ($\mu g/Nm^3$)	SO_2 ($\mu g/Nm^3$)	HCL ($\mu g/Nm^3$)
Date	Time	Date	Time					
25/10/07	3:00 pm	26/10/07	9:30 am	28.61	20.46	10.09	BDL	BDL
26/10/07	9:30 am	27/10/07	9:30 am	24.03	22.28	10.08	**BDL**	**BDL**
27/10/07	9:30 am	28/10/07	9:30 am	29.16	19.48	7.31	BDL	BDL
28/10/07	9:30 am	29/10/07	9:30 am	25.84	21.75	6.25	BDL	BDL
29/10/07	9:30 am	30/11/07	9:30 am	32.84	22.35	7.27	BDL	BDL
30/11/07	9:30 am	31/11/07	9:30 am	48.40	34.19	10.82	BDL	BDL
31/11/07	9:30 am	1/11/07	9:00 am	30.02	14.13	1.96	**BDL**	BDL
1/11/07	9:00 am	2/11/07	9:00 am	26.15	16.19	5.58	BDL	BDL
2/11/07	9:00 am	3/11/07	9:00 am	24.52	15.80	6.81	BDL	BDL
3/11/07	9:00 am	4/11/07	9:00 am	12.25	30.28	6.92	BDL	BDL
4/11/07	9:00 am	5/11/07	9:00 am	41.64	19.89	7.42	BDL	BDL
5/11/07	9:00 am	6/11/07	9:00 am	14.15	18.71	7.07	BDL	BDL
6/11/07	9:00 am	7/11/07	9:00 am	55.88	20.93	5.18	BDL	BDL
7/11/07	9:00 am	8/11/07	9:00 am	32.01	18.24	7.52	BDL	BDL
8/11/07	9:00 am	9/11/07	9:00 am	21.42	9.64	5.54	BDL	BDL
9/11/07	9:00 am	10/11/07	9:00 am	17.68	17.61	4.73	BDL	BDL
10/11/07	9:00 am	11/11/07	9:00 am	89.03	60.05	20.84	BDL	BDL
11/11/07	9:00 am	12/11/07	9:00 am	52.94	38.89	14.36	BDL	BDL
12/11/07	9:00 am	13/11/07	9:00 am	57.10	42.07	14.99	BDL	BDL
13/11/07	9:00 am	14/11/07	9:00 am	38.14	29.22	8.48	BDL	BDL
14/11/07	9:00 am	15/11/07	9:00 am	31.07	19.35	3.93	BDL	BDL
15/11/07	9:00 am	16/11/07	9:00 am	56.70	22.52	7.74	BDL	BDL
16/11/07	9:00 am	17/11/07	9:00 am	33.93	11.13	5.58	BDL	BDL
17/11/07	9:00 am	18/11/07	9:00 am	46.59	34.04	10.64	BDL	BDL
18/11/07	9:00 am	19/11/07	9:00 am	54.23	14.86	12.08	BDL	BDL
19/11/07	9:00 am	20/11/07	9:00 am	54.90	35.98	7.41	BDL	BDL
20/11/07	9:00 am	21/11/07	9:00 am	35.14	24.38	5.47	BDL	BDL
21/11/07	9:00 am	22/11/07	9:00 am	28.07	21.52	6.18	**BDL**	BDL
22/11/07	9:00 am	23/11/07	9:00 am	59.46	31.19	8.07	BDL	BDL
23/11/07	9:00 am	24/11/07	9:00 am	28.29	16.59	3.00	BDL	BDL
24/11/07	9:00 am	25/11/07	9:00 am	47.39	31.45	6.65	BDL	BDL
EMA Draft Air Pollution Rules 2005				**150**	**75**	**65**	**125**	**100**

Appendix III

Raw Data

Meteorological Data

(Temperature, Pressure, Wind Speed, Wind Direction, Rainfall, Humidity, Solar Radiation).

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation.

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
10/25/2007	16:30	17:30	21.58	91.6	1.60	SSW	202.5	766.40	1.42	
	17:30	18:30	21.46	93.8	0.42	S	180.0	766.82	0.92	
	18:30	19:30	22.88	93.2	0.98	S	180.0	766.62	0.10	
	19:30	20:30	25.20	87.6	0.68	SSE	157.5	766.52	0.00	
	20:30	21:30	26.40	83.2	0.86	SSW	202.5	766.38	0.00	
	21:30	22:30	27.62	79.6	1.50	SW	225.0	766.02	0.00	
	22:30	23:30	28.46	75.8	1.88	SW	225.0	765.76	0.00	
25-26, October	23:30	0:30	28.60	75.2	1.96	SW	225.0	765.14	0.00	
10/26/2007	0:30	1:30	28.38	75.4	2.30	SSW	202.5	764.64	0.00	
	1:30	2:30	28.38	77.0	1.50	S	180.0	764.46	0.00	
	2:30	3:30	28.22	78.6	1.22	SSE	157.5	764.38	0.00	
	3:30	4:30	27.56	81.0	1.12	SSE	157.5	764.30	0.00	
	4:30	5:30	26.36	86.0	0.62	SE	135.0	764.44	0.00	
	5:30	6:30	25.92	87.8	0.98	SE	135.0	764.62	0.00	
	6:30	7:30	25.92	88.4	1.14	ESE	112.5	765.14	0.00	
	7:30	8:30	25.26	90.6	0.52	E	90.0	765.52	0.00	
	8:30	9:30	24.64	92.8	0.24	E	90.0	765.58	0.00	
	9:30	10:30	24.42	93.8	0.32	ESE	112.5	765.42	0.00	
	10:30	11:30	24.90	93.2	0.34	ESE	112.5	765.46	0.00	
	11:30	12:30	25.34	90.8	0.08	SE	135.0	765.30	0.00	
	12:30	13:30	25.30	91.8	0.32	ESE	112.5	764.88	0.00	
	13:30	14:30	25.46	91.4	0.60	SE	135.0	764.62	0.00	
	14:30	15:30	25.66	90.8	0.78	SE	135.0	764.64	0.00	
	15:30	16:30	25.46	91.0	0.96	SSE	157.5	764.86	0.00	
	16:30	17:30	25.34	91.8	0.50	SE	135.0	765.00	0.00	
	17:30	18:30	26.90	87.0	1.32	SSE	157.5	765.36	0.00	
	18:30	19:30	28.06	82.6	2.50	SSE	157.5	765.74	0.00	
	19:30	20:30	28.42	82.0	2.22	SSE	157.5	766.24	0.00	
	20:30	21:30	29.08	79.2	2.60	SSE	157.5	766.22	0.00	
	21:30	22:30	29.96	74.4	3.76	SSE	157.5	765.78	0.00	
	22:30	23:30	29.84	73.8	4.02	SE	135.0	765.30	0.31	
26-27, October	23:30	0:30	28.62	82.2	2.58	SE	135.0	764.80	0.25	

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
10/27/2007	0:30	1:30	29.24	75.4	3.58	SE	135.0	764.04	0.00	
	1:30	2:30	28.68	77.2	2.68	SE	135.0	763.80	0.00	
	2:30	3:30	28.34	79.6	1.60	ESE	112.5	763.86	0.00	
	3:30	4:30	26.44	83.8	1.96	ESE	112.5	764.12	0.25	
	4:30	5:30	25.40	88.0	1.48	SE	135.0	764.24	0.00	
	5:30	6:30	26.14	87.0	2.22	ESE	112.5	764.92	0.00	
	6:30	7:30	26.04	87.0	2.06	ESE	112.5	765.46	0.00	
	7:30	8:30	26.16	85.8	2.12	ESE	112.5	765.74	0.00	
	8:30	9:30	26.18	85.6	1.50	SSE	157.5	765.84	0.00	
	9:30	10:30	25.98	86.8	2.06	SSE	157.5	765.86	0.00	
	10:30	11:30	25.94	82.8	2.32	ESE	112.5	765.74	0.00	
	11:30	12:30	25.26	86.2	1.42	ESE	112.5	765.26	0.00	
	12:30	13:30	25.56	88.2	1.24	SE	135.0	764.90	0.00	
	13:30	14:30	25.08	89.6	0.50	SE	135.0	764.72	0.00	
	14:30	15:30	25.06	89.6	1.04	ESE	112.5	764.74	0.00	
	15:30	16:30	25.50	87.4	1.06	ESE	112.5	764.86	0.00	
	16:30	17:30	25.62	87.4	1.06	ESE	112.5	765.38	0.00	
	17:30	18:30	26.86	84.2	1.24	ESE	112.5	765.94	0.00	
	18:30	19:30	28.72	79.0	2.60	ESE	112.5	766.38	0.00	
	19:30	20:30	29.74	74.6	3.32	ESE	112.5	766.72	0.00	
	20:30	21:30	30.28	71.2	3.40	ESE	112.5	766.88	0.00	
	21:30	22:30	31.22	68.2	3.30	SE	135.0	766.50	0.00	
	22:30	23:30	31.72	65.0	3.48	ESE	112.5	765.70	0.00	
27-28, October	23:30	0:30	31.66	64.8	3.74	NE	45.0	764.92	0.00	
10/28/2007	0:30	1:30	31.70	60.6	3.56	NE	45.0	764.30	0.00	
	1:30	2:30	31.44	60.0	3.30	NE	45.0	764.00	0.00	
	2:30	3:30	30.64	60.4	3.12	NE	45.0	764.28	0.00	
	3:30	4:30	28.82	68.2	2.04	NE	45.0	764.74	0.00	
	4:30	5:30	26.62	80.4	0.50	NNE	22.5	765.22	0.00	
	5:30	6:30	25.60	86.8	0.16	NNE	22.5	765.66	0.00	
	6:30	7:30	25.02	90.2	0.24	ENE	67.5	766.10	0.00	
	7:30	8:30	24.94	91.2	0.70	ENE	67.5	766.42	0.00	

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
10/28/2007	8:30	9:30	25.14	90.8	0.90	E	90.0	766.44	0.00	
	9:30	10:30	24.96	91.4	0.42	E	90.0	766.30	0.00	
	10:30	11:30	24.44	92.4	0.08	ENE	67.5	766.10	0.00	
	11:30	12:30	23.78	93.8	0.18	ENE	67.5	765.78	0.00	
	12:30	13:30	23.70	94.0	0.60	SE	135.0	765.34	0.00	
	14:30	15:30	23.64	93.8	0.60	SSW	202.5	765.08	0.00	
	15:30	16:30	23.66	93.0	0.40	ENE	67.5	764.98	0.00	
	16:30	17:30	23.54	93.4	0.50	ENE	67.5	765.28	0.00	
	17:30	18:30	23.70	93.6	0.78	SE	135.0	765.76	0.00	
	18:30	19:30	25.32	91.2	1.06	ENE	67.5	766.14	0.00	
	19:30	20:30	27.88	84.2	1.86	E	90.0	766.60	0.00	
	20:30	21:30	29.80	76.4	3.30	E	90.0	766.90	0.00	
	21:30	22:30	30.66	71.8	3.94	ENE	67.5	766.78	0.00	
	22:30	23:30	31.06	70.0	4.02	E	90.0	766.22	0.00	
28-29, October	23:30	0:30	31.40	68.6	3.64	E	90.0	765.66	0.00	
10/29/2007	0:30	1:30	31.14	69.6	3.92	E	90.0	765.20	0.00	
	1:30	2:30	30.46	70.8	3.58	ESE	112.5	764.88	0.00	
	2:30	3:30	28.96	76.6	2.14	SE	135.0	765.02	0.00	
	3:30	4:30	26.84	85.2	1.50	SSE	157.5	765.50	2.34	
	4:30	5:30	25.46	92.4	0.78	ESE	112.5	765.64	0.46	
	5:30	6:30	25.54	92.4	1.70	ESE	112.5	765.60	0.15	
	6:30	7:30	25.62	91.8	1.70	ESE	112.5	765.68	0.00	
	7:30	8:30	25.62	90.4	1.78	ESE	112.5	766.06	0.00	
	8:30	9:30	25.48	90.2	1.06	ESE	112.5	766.64	0.00	
	9:30	10:30	25.30	90.0	0.96	E	90.0	767.02	0.00	
	10:30	11:30	24.78	92.2	0.24	ENE	67.5	767.16	0.00	
	11:30	12:30	24.44	93.8	0.26	SE	135.0	767.14	0.00	
	12:30	13:30	24.58	94.0	0.68	SSE	157.5	766.70	0.00	
	13:30	14:30	24.60	93.2	0.52	E	90.0	766.16	0.00	
	14:30	15:30	24.54	93.0	0.24	E	90.0	765.70	0.00	
	15:30	16:30	24.28	93.0	0.24	W	270.0	765.70	0.00	
	16:30	17:30	23.96	93.2	0.00	NE	45.0	765.92	0.00	

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
10/29/2007	17:30	18:30	24.06	94.0	0.62	SW	225.0	766.34	0.05	
	18:30	19:30	25.32	90.6	1.70	ESE	112.5	766.80	0.05	
	19:30	20:30	26.02	88.8	1.60	SE	135.0	767.10	0.25	
	20:30	21:30	25.96	90.2	1.58	ESE	112.5	767.36	0.15	
	21:30	22:30	27.80	85.2	1.42	ESE	112.5	767.34	0.00	
	22:30	23:30	29.74	78.2	2.32	SE	135.0	766.86	0.00	
29-30, October	23:30	0:30	30.58	74.0	2.96	ESE	112.5	766.04	0.00	
10/30/2007	0:30	1:30	30.34	72.6	3.12	ESE	112.5	765.46	0.00	
	1:30	2:30	28.78	77.6	2.30	SE	135.0	764.92	0.00	
	2:30	3:30	29.60	74.4	3.74	E	90.0	764.64	0.00	
	3:30	4:30	28.66	77.6	3.02	E	90.0	764.66	0.00	
	4:30	5:30	27.84	80.4	2.58	E	90.0	764.96	0.00	
	5:30	6:30	26.62	86.0	1.34	ENE	67.5	765.28	0.00	
	6:30	7:30	25.70	89.4	0.80	E	90.0	765.44	0.00	
	7:30	8:30	25.26	90.2	0.80	E	90.0	765.82	0.00	
	8:30	9:30	24.82	91.4	0.32	ENE	67.5	766.20	0.00	
	9:30	10:30	24.84	90.0	0.96	E	90.0	766.32	0.00	
	10:30	11:30	24.66	91.2	0.88	ENE	67.5	766.38	0.00	
	11:30	12:30	24.54	92.2	0.98	E	90.0	766.18	0.00	
	12:30	13:30	24.30	93.0	0.80	ENE	67.5	765.68	0.00	
	13:30	14:30	24.34	92.4	0.78	SE	135.0	765.38	0.00	
	14:30	15:30	24.06	92.6	0.08	ENE	67.5	765.20	0.00	
	15:30	16:30	24.04	92.4	0.88	SE	135.0	765.20	0.00	
	16:30	17:30	23.98	92.0	0.98	ENE	67.5	765.30	0.00	
	17:30	18:30	23.92	92.0	0.60	E	90.0	765.64	0.00	
	18:30	19:30	24.14	89.8	1.42	E	90.0	766.32	0.10	
	19:30	20:30	25.34	87.8	1.24	ENE	67.5	766.60	0.05	
	20:30	21:30	28.24	82.2	2.66	ENE	67.5	766.90	0.00	
	21:30	22:30	29.74	75.0	2.84	SE	135.0	766.96	0.00	
	22:30	23:30	30.92	67.8	3.22	E	90.0	766.56	0.00	
30-31, October	23:30	0:30	31.30	64.6	3.22	ENE	67.5	765.78	0.00	
10/31/2007	0:30	1:30	31.78	62.0	3.02	NNE	22.5	765.08	0.00	

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
10/31/2007	1:30	2:30								
	2:30	3:30								
	3:30	4:30								
	4:30	5:30								
	5:30	6:30								
	6:30	7:30								
	7:30	8:30								
	8:30	9:30								
	9:30	10:30								
	10:30	11:30								
	11:30	12:30								
	12:30	13:30								
	13:30	14:00								
	14:00	15:00								
	15:00	16:00								
	16:00	17:00								
	17:00	18:00								
	18:00	19:00								
	20:00	21:00								
	21:00	22:00								
	22:00	23:00								
	23:00	0:00								
11/01/2007	0:00	1:00								
	1:00	2:00	23.78	93.25	0.20	NE	45.0	765.05	0.00	0
	2:00	3:00	23.78	93.60	0.44	NNW	337.5	764.78	0.00	0
	3:00	4:00	24.04	92.40	1.50	SSW	202.5	764.52	0.00	0
	4:00	5:00	23.78	91.80	1.14	ENE	67.5	764.32	0.00	0
	5:00	6:00	23.68	92.00	0.60	E	90.0	764.70	0.00	0
	6:00	7:00	24.08	91.40	0.78	SW	225.0	765.18	0.00	0
	7:00	8:00	24.00	92.60	0.80	W	270.0	765.56	0.00	10.8
	8:00	9:00	24.42	91.80	1.42	SW	225.0	765.98	0.00	48.2
	9:00	10:00	25.64	87.20	2.22	SW	225.0	766.38	0.00	207.6

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/01/2007	10:00	11:00	27.36	82.60	2.14	E	90.0	766.68	0.00	318.4
	11:00	12:00	29.16	75.20	2.32	E	90.0	766.34	0.00	334.2
	12:00	13:00	29.74	74.40	2.30	ESE	112.5	765.70	0.00	512.6
	13:00	14:00	27.50	81.80	2.02	SE	135.0	765.32	3.66	219.8
	14:00	15:00	26.22	88.80	0.88	SE	135.0	764.64	0.25	241
	15:00	16:00	28.38	82.20	1.76	E	90.0	764.20	0.00	359.2
	16:00	17:00	27.82	80.00	1.76	ESE	112.5	764.12	0.00	222.6
	17:00	18:00	28.30	80.20	1.68	E	90.0	764.10	0.00	205
	18:00	19:00	27.40	84.00	1.86	E	90.0	764.10	0.00	53.2
	19:00	20:00	25.98	89.00	1.06	ENE	67.5	764.14	0.00	0
	20:00	21:00	25.34	90.60	1.14	SSW	202.5	764.42	0.00	0
	21:00	22:00	24.98	91.80	1.06	W	270.0	764.94	0.00	0
	22:00	23:00	24.68	92.60	1.06	W	270.0	765.36	0.00	0
	23:00	0:00	24.22	94.00	0.60	NNE	22.5	765.52	0.00	0
11/02/2007	0:00	1:00	24.04	94.00	0.08	NNE	22.5	765.48	0.00	0
	1:00	2:00	23.92	94.20	0.00	NNE	22.5	765.48	0.00	0
	2:00	3:00	23.82	94.00	0.00	NNE	22.5	765.34	0.00	0
	3:00	4:00	23.68	94.40	0.00	NNE	22.5	765.14	0.00	0
	4:00	5:00	23.60	94.80	0.08	W	270.0	765.08	0.00	0
	5:00	6:00	23.52	95.00	0.00	ENE	67.5	765.34	0.00	0
	6:00	7:00	23.30	95.00	0.00	ENE	67.5	765.86	0.00	0.4
	7:00	8:00	23.50	95.40	0.00	SSW	202.5	766.34	0.00	44.4
	8:00	9:00	25.34	94.80	0.08	N	0.0	766.84	0.00	242.2
	9:00	10:00	28.72	82.80	1.42	SE	135.0	767.16	0.00	504.4
	10:00	11:00	30.58	72.80	1.96	SE	135.0	767.32	0.05	341.8
	11:00	12:00	31.30	71.00	2.20	SSE	157.5	766.60	0.00	147
	12:00	13:00	30.40	72.00	2.20	ESE	112.5	765.40	0.00	666
	13:00	14:00	26.30	85.00	1.80	SSE	157.5	765.10	2.03	297
	14:00	15:00	28.50	83.00	0.90	SSW	202.5	764.80	0.00	266
	15:00	16:00	27.90	84.00	1.30	ESE	112.5	764.90	0.51	145
	16:00	17:00	26.70	87.00	0.90	ESE	112.5	765.10	0.00	31
	17:00	18:00	26.40	86.00	0.90	ENE	67.5	765.50	0.00	8

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/02/2007	18:00	19:00	25.20	91.00	0.00	ESE	112.5	765.70	0.00	0
	19:00	20:00	24.90	92.00	0.90	ENE	67.5	766.20	0.00	0
	20:00	21:00	24.60	93.00	0.00	ENE	67.5	766.70	0.00	0
	21:00	22:00	24.60	94.00	0.40	NE	45.0	766.70	0.00	0
	22:00	23:00	24.50	94.00	1.30	NE	45.0	766.70	0.00	0
	23:00	0:00	24.40	94.00	0.90	NE	45.0	766.60	0.00	0
11/03/2007	0:00	1:00	24.00	94.00	0.40	NNE	22.5	766.20	0.00	0
	1:00	2:00	23.80	94.00	0.40	NNE	22.5	765.60	0.00	0
	2:00	3:00	23.80	95.00	0.40	NE	45.0	765.70	0.00	0
	3:00	4:00	24.10	94.00	1.30	ENE	67.5	765.40	0.00	0
	4:00	5:00	24.10	94.00	0.00	ESE	112.5	765.90	0.00	0
	5:00	6:00	23.70	94.00	0.00	NNE	22.5	766.50	0.25	0
	6:00	7:00	24.20	95.00	0.90	NE	45.0	767.10	0.00	44
	7:00	8:00	27.30	88.00	1.30	NE	45.0	767.50	0.00	309
	8:00	9:00	29.30	77.00	1.80	ESE	112.5	767.60	0.00	287
	9:00	10:00	29.80	76.00	1.80	ESE	112.5	767.40	0.00	203
	10:00	11:00	31.20	68.00	1.80	ESE	112.5	766.80	0.00	208
	11:00	12:00	31.20	68.00	2.70	ENE	67.5	765.80	0.00	615
	12:00	13:00	32.40	63.00	3.10	ESE	112.5	765.30	0.00	903
	13:00	14:00	30.20	71.00	3.60	ENE	67.5	764.90	0.25	764
	14:00	15:00	29.40	72.00	3.60	ENE	67.5	764.70	0.00	478
	15:00	16:00	29.50	72.00	2.70	ENE	67.5	764.40	0.00	249
	16:00	17:00	28.60	74.00	2.70	ENE	67.5	764.40	0.00	183
	17:00	18:00	26.60	84.00	0.40	ENE	67.5	764.90	0.00	14
	18:00	19:00	25.50	89.00	0.40	ESE	112.5	765.20	0.00	0
	19:00	20:00	25.10	91.00	0.00	ESE	112.5	766.00	0.00	0
	20:00	21:00	25.00	92.00	0.90	ENE	67.5	766.10	0.00	0
	21:00	22:00	24.70	92.00	0.40	ENE	67.5	766.30	0.00	0
	22:00	23:00	24.20	93.00	0.40	ENE	67.5	766.10	0.00	0
	23:00	0:00	24.20	92.00	0.40	ENE	67.5	765.60	0.00	0
11/04/2007	0:00	1:00	23.60	94.00	0.90	ENE	67.5	764.70	0.00	0
	1:00	2:00	23.10	94.00	0.40	NNE	22.5	764.40	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/04/2007	2:00	3:00	23.00	95.00	0.40	NNE	22.5	764.20	0.00	0
	3:00	4:00	22.70	94.00	0.00	NNE	22.5	764.40	0.00	0
	4:00	5:00	22.60	95.00	0.00	NNE	22.5	764.60	0.00	0
	5:00	6:00	22.70	95.00	0.40	NNE	22.5	764.90	0.00	0
	6:00	7:00	23.60	96.00	0.40	NE	45.0	765.60	0.00	39
	7:00	8:00	26.80	87.00	0.90	ENE	67.5	766.00	0.00	188
	8:00	9:00	29.10	77.00	1.80	ENE	67.5	766.10	0.00	477
	9:00	10:00	29.90	76.00	2.70	ESE	112.5	766.00	0.00	190
	10:00	11:00	31.40	65.00	3.10	ESE	112.5	765.70	0.00	171
	11:00	12:00	30.70	66.00	3.60	ESE	112.5	765.00	0.00	653
	12:00	13:00	31.60	61.00	3.60	ESE	112.5	764.10	0.00	768
	13:00	14:00	31.20	64.00	3.10	ESE	112.5	763.20	0.00	652
	14:00	15:00	29.70	67.00	3.10	ESE	112.5	762.80	0.00	500
	15:00	16:00	28.90	71.00	2.20	SSE	157.5	762.90	0.00	250
	16:00	17:00	28.10	75.00	1.30	ESE	112.5	763.50	0.00	59
	17:00	18:00	26.30	86.00	0.40	SE	135.0	763.90	0.00	12
	18:00	19:00	25.60	89.00	0.00	ESE	112.5	764.40	0.00	0
	19:00	20:00	25.10	90.00	0.00	ENE	67.5	764.80	0.00	0
	20:00	21:00	24.70	91.00	0.90	ENE	67.5	765.20	0.00	0
	21:00	22:00	24.40	93.00	0.90	NE	45.0	765.20	0.00	0
	22:00	23:00	24.10	93.00	0.90	NE	45.0	764.90	0.00	0
	23:00	0:00	24.20	90.00	1.30	ENE	67.5	764.50	0.00	0
11/05/2007	0:00	2:00	24.10	90.00	0.90	NE	45.0	763.90	0.00	0
	1:00	3:00	23.60	92.00	0.40	ENE	67.5	763.40	0.00	0
	2:00	4:00	23.50	93.00	0.40	ENE	67.5	763.10	0.00	0
	3:00	5:00	23.40	93.00	0.00	NE	45.0	763.20	0.00	0
	4:00	6:00	23.00	93.00	0.00	NE	45.0	763.70	0.00	0
	5:00	6:00	22.80	94.00	0.00	NE	45.0	764.20	0.00	2
	6:00	7:00	24.10	96.00	0.00	NE	45.0	764.70	0.00	85
	7:00	8:00	27.30	87.00	0.40	ENE	67.5	765.30	0.00	238
	8:00	9:00	28.70	79.00	1.80	ESE	112.5	765.80	0.00	338
	9:00	10:00	29.90	74.00	1.80	ESE	112.5	765.70	0.00	292

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	*Sampling Period*		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/05/2007	10:00	11:00	30.60	70.00	1.80	ESE	112.5	765.30	0.00	313
	11:00	12:00	31.80	61.00	1.80	ESE	112.5	764.50	0.00	469
	12:00	13:00	28.30	78.00	1.30	NW	315.0	763.70	0.00	290
	13:00	14:00	27.10	84.00	1.80	NNE	22.5	763.20	0.25	267
	14:00	15:00	25.10	90.00	2.70	NNW	337.5	763.40	36.58	72
	15:00	16:00	26.70	88.00	2.70	NE	45.0	763.00	11.94	302
	16:00	17:00	26.60	85.00	1.80	NE	45.0	763.00	0.00	217
	17:00	18:00	25.70	88.00	0.90	ENE	67.5	763.70	0.00	16
	18:00	19:00	25.00	90.00	0.90	ENE	67.5	764.10	0.00	0
	19:00	20:00	24.40	91.00	0.40	ESE	112.5	764.70	0.00	0
	20:00	21:00	24.10	91.00	0.40	ENE	67.5	765.10	0.00	0
	21:00	22:00	23.80	92.00	0.90	NE	45.0	765.40	0.00	0
	22:00	23:00	23.70	93.00	0.90	NE	45.0	765.40	0.00	0
	23:00	0:00	23.50	93.00	0.40	NNE	22.5	765.30	0.00	0
11/06/2007	0:00:00	1:00	23.4	94	0.4	NW	315.0	764.80	0.00	0
	1:00:00	2:00	23.1	94	0	NW	315.0	764.70	0.00	0
	2:00:00	3:00	22.9	94	0.9	NNW	337.5	764.50	0.00	0
	3:00:00	4:00	22.8	95	0	NNW	337.5	764.50	0.00	0
	4:00:00	5:00	22.7	94	0	NNW	337.5	764.60	0.00	0
	5:00:00	6:00	22.7	95	0	NNW	337.5	765.20	0.00	0
	6:00:00	7:00	23.5	96	0	NNW	337.5	765.70	0.00	51
	7:00	8:00	27	91	0.4	NE	45.0	766.20	0.00	260
	8:00	9:00	29.1	80	1.8	NE	45.0	766.70	0.00	435
	9:00	10:00	29.9	73	2.7	NE	45.0	766.90	0.25	242
	10:00	11:00	28	81	3.1	NE	45.0	766.30	0.00	225
	11:00	12:00	30.6	73	2.7	NE	45.0	765.70	0.00	675
	12:00	13:00	30.1	72	2.2	ENE	67.5	764.90	0.25	627
	13:00	14:00	30.3	68	2.2	NE	45.0	764.20	0.00	465
	14:00	15:00	31.2	66	2.2	ENE	67.5	763.60	0.00	566
	15:00	16:00	30.3	66	2.7	NE	45.0	763.60	0.00	372
	16:00	17:00	29	75	2.2	NNE	22.5	763.80	0.00	186
	17:00	18:00	27.2	83	1.3	NNE	22.5	764.30	0.00	19

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/06/2007	18:00	19:00	26	87	0.9	NNE	22.5	764.90	0.00	0
	19:00	20:00	26	86	0.9	NNE	22.5	765.60	0.00	0
	20:00	21:00	25.4	89	0.9	NNE	22.5	766.00	0.00	0
	21:00	22:00	25.3	89	0.4	NNE	22.5	766.00	0.00	0
	22:00	23:00	24.9	90	0.4	NNE	22.5	765.80	0.00	0
	23:00	0:00	24.1	93	0	NNE	22.5	765.70	0.00	0
11/07/2007	0:00	1:00	24	94	0	NNE	22.5	765.10	0.00	0
	1:00	2:00	23.9	94	0	N	0.0	765.00	0.00	0
	2:00	3:00	23.8	93	0	NNE	22.5	764.80	0.00	0
	3:00	4:00	23.8	93	0	NNE	22.5	764.90	0.00	0
	4:00	5:00	23.4	94	0	N	0.0	765.30	0.00	0
	5:00	6:00	23.3	94	0	N	0.0	765.70	0.00	0
	6:00	7:00	24.9	94	0	N	0.0	766.30	0.00	89
	7:00	8:00	28.4	82	0.9	N	0.0	766.50	0.00	282
	8:00	9:00	29.7	76	2.7	NNE	22.5	766.90	0.00	473
	9:00	10:00	29.9	71	3.6	NNE	22.5	766.80	0.00	252
	10:00	11:00	31.4	64	3.1	NE	45.0	766.30	0.00	218
	11:00	12:00	31.2	63	3.1	NE	45.0	765.80	0.00	629
	12:00	13:00	31.5	68	2.7	NE	45.0	765.00	0.00	633
	13:00	14:00	32	59	3.1	NE	45.0	764.40	0.00	818
	14:00	15:00	31.9	57	3.1	ENE	67.5	763.80	0.00	683
	15:00	16:00	30.8	57	3.1	NE	45.0	763.70	0.00	497
	16:00	17:00	29.2	65	2.2	NE	45.0	763.90	0.00	213
	17:00	18:00	26.7	76	1.3	NNE	22.5	764.30	0.00	9
	18:00	19:00	25.2	84	0.4	NE	45.0	764.80	0.00	0
	19:00	20:00	24.7	88	0.4	NNE	22.5	765.50	0.00	0
	20:00	21:00	24.7	88	0.9	N	0.0	765.80	0.00	0
	21:00	22:00	24.5	89	0.4	N	0.0	765.90	0.00	0
	22:00	23:00	23.8	90	0	N	0.0	765.80	0.00	0
	23:00	0:00	24.4	91	0.4	NNE	22.5	765.60	0.00	0
11/08/2007	0:00	1:00	24.8	90	0.4	NNE	22.5	765.30	0.00	0
	1:00	2:00	24.7	90	0.9	NNE	22.5	764.80	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/08/2007	2:00	3:00	23.7	91	0.4	NNE	22.5	764.60	0.00	0
	3:00	4:00	23.9	92	0	NE	45.0	764.60	0.00	0
	4:00	5:00	24.3	92	0.4	NE	45.0	764.90	0.00	0
	5:00	6:00	24.6	90	0.4	NE	45.0	765.20	0.00	0
	6:00	7:00	26.3	86	0.9	NE	45.0	765.70	0.00	86
	7:00	8:00	28.2	78	1.8	NNE	22.5	766.20	0.00	300
	8:00	9:00	29.4	73	3.1	NNE	22.5	766.70	0.00	496
	9:00	10:00	30.8	67	3.6	NNE	22.5	766.70	0.00	203
	10:00	11:00	31.1	64	3.1	NE	45.0	766.30	0.00	146
	11:00	12:00	32.5	56	3.1	NNE	22.5	765.60	0.00	796
	12:00	13:00	31.4	61	3.1	NNE	22.5	764.80	0.00	706
	13:00	14:00	31.9	56	3.6	NE	45.0	764.30	0.00	775
	14:00	15:00	32	57	2.7	NNE	22.5	763.90	0.00	693
	15:00	16:00	30.6	62	2.7	NNE	22.5	764.00	0.00	430
	16:00	17:00	29.1	68	2.2	NNE	22.5	764.50	0.00	192
	17:00	18:00	26.8	77	1.3	NNE	22.5	765.00	0.00	24
	18:00	19:00	25.2	87	0	NE	45.0	765.40	0.00	0
	19:00	20:00	24.6	89	0	NE	45.0	766.00	0.00	0
	20:00	21:00	24.4	90	0.4	NNE	22.5	766.20	0.00	0
	21:00	22:00	24	92	0.4	NNW	337.5	766.40	0.00	0
	22:00	23:00	23.6	93	0	NNW	337.5	766.20	0.00	0
	23:00	0:00	23.5	93	0.4	NNW	337.5	766.00	0.00	0
11/09/2007	0:00	1:00	23.4	93	0	NNW	337.5	765.40	0.00	0
	1:00	2:00	23.2	94	0	NNW	337.5	764.90	0.00	0
	2:00	3:00	23.4	94	0	NNW	337.5	764.80	0.00	0
	3:00	4:00	23.6	94	0	NNW	337.5	764.80	0.00	0
	4:00	5:00	23.4	94	0	NNW	337.5	765.00	0.00	0
	5:00	6:00	23.8	93	0.4	N	0.0	765.70	0.00	0
	6:00	7:00	25.9	90	0.4	N	0.0	766.10	0.00	83
	7:00	8:00	28.6	81	1.3	N	0.0	766.50	0.00	318
	8:00	9:00	30.4	73	2.7	NNE	22.5	767.00	0.00	544

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/09/2007	9:00	10:00	30.8	67	2.2	NE	45.0	767.00	0.00	217
	10:00	11:00	32.1	62	2.2	E	90.0	766.40	1.02	495
	11:00	12:00	32.8	57	2.2	ESE	112.5	765.60	0.00	1024
	12:00	13:00	33.1	54	2.2	E	90.0	764.80	0.00	930
	13:00	14:00	30.8	73	2.7	NNE	22.5	764.30	0.25	602
	14:00	15:00	30.6	64	2.7	E	90.0	764.10	0.00	516
	15:00	16:00	28.1	72	2.2	ENE	67.5	764.30	0.00	95
	16:00	17:00	28	77	0.9	E	90.0	764.40	0.00	99
	17:00	18:00	26.7	83	1.3	E	90.0	764.40	0.00	44
	18:00	19:00	25.5	89	0.4	ENE	67.5	765.00	0.00	0
	19:00	20:00	25.1	90	0.4	ENE	67.5	765.70	0.00	0
	20:00	21:00	25.3	90	1.3	ENE	67.5	766.20	0.25	0
	21:00	22:00	24.9	90	1.3	ENE	67.5	766.50	0.00	0
	22:00	23:00	24.2	93	0.4	E	90.0	766.50	0.00	0
	23:00	0:00	24.3	91	0.9	NE	45.0	765.80	0.00	0
11/10/2007	0:00	1:00	23.8	93	0.9	ENE	67.5	765.70	0.00	0
	1:00	2:00	23.8	93	0.9	ENE	67.5	765.10	0.00	0
	2:00	3:00	23.8	94	0.4	NE	45.0	764.90	0.25	0
	3:00	4:00	23.7	94	0.4	NNE	22.5	765.00	0.00	0
	4:00	5:00	23.9	94	0.4	NE	45.0	765.30	1.52	0
	5:00	6:00	23.4	95	0.4	NNE	22.5	765.50	0.51	0
	6:00	7:00	23.4	94	0.4	NNE	22.5	765.90	0.00	18
	7:00	8:00	24.2	93	0.9	NE	45.0	766.90	0.00	61
	8:00	9:00	25.3	90	0.4	SSE	157.5	767.40	0.00	137
	9:00	10:00	28.2	84	0.4	SSE	157.5	767.30	0.25	345
	10:00	11:00	28.9	77	2.2	ENE	67.5	766.60	0.00	503
	11:00	12:00	25.3	89	3.1	NE	45.0	765.90	0.76	371
	12:00	13:00	27.5	90	1.3	ENE	67.5	765.30	4.32	337
	13:00	14:00	27.8	84	0.9	ESE	112.5	764.60	1.02	274
	14:00	15:00	27.1	84	3.6	ENE	67.5	764.70	0.00	444
	15:00	16:00	25.6	88	2.2	ENE	67.5	764.50	0.00	146
	16:00	17:00	24.8	92	1.3	ENE	67.5	764.50	0.25	37

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/10/2007	17:00	18:00	24.6	93	0.9	ENE	67.5	764.50	0.00	4
	18:00	19:00	24.4	93	0	E	90.0	765.10	0.00	0
	19:00	20:00	24.3	93	0	ENE	67.5	765.70	0.00	0
	20:00	21:00	23.9	94	0	---	---	766.10	0.00	0
	21:00	22:00	23.9	95	0	ENE	67.5	766.50	0.00	0
	22:00	23:00	23.7	95	0	ENE	67.5	766.70	0.00	0
	23:00	0:00	23.4	95	0	ENE	67.5	766.40	0.00	0
11/11/2007	0:00	1:00	24	95	0.4	N	0.0	765.90	1.52	0
	1:00	2:00	24	95	0.4	ENE	67.5	765.60	1.78	0
	2:00	3:00	23.8	95	0	ENE	67.5	765.10	0.00	0
	3:00	4:00	23.7	95	0	ESE	112.5	765.30	0.00	0
	4:00	5:00	23	95	0	ESE	112.5	765.30	0.00	0
	5:00	6:00	23	96	0	NE	45.0	765.70	0.25	0
	6:00	7:00	24.3	96	0.4	NE	45.0	766.00	0.00	55
	7:00	8:00	26.2	90	1.3	NE	45.0	766.80	0.00	195
	8:00	9:00	28.4	85	2.2	ENE	67.5	767.00	2.03	434
	9:00	10:00	28.2	84	2.2	ENE	67.5	766.90	0.25	240
	10:00	11:00	30.5	72	2.7	E	90.0	766.40	0.00	645
	11:00	12:00	28.6	81	3.6	ENE	67.5	766.10	0.25	652
	12:00	13:00	29.7	71	3.1	ENE	67.5	765.30	0.00	368
	13:00	14:00	31.2	69	3.6	E	90.0	764.80	0.00	652
	14:00	15:00	29.3	75	3.6	E	90.0	764.70	0.00	442
	15:00	16:00	29	74	4	E	90.0	764.80	0.00	199
	16:00	17:00	26.6	86	3.6	E	90.0	764.90	0.76	70
	17:00	18:00	26.2	86	1.8	E	90.0	765.20	0.00	5
	18:00	19:00	26.2	86	2.2	ENE	67.5	765.70	0.00	0
	19:00	20:00	25.7	86	1.8	E	90.0	766.40	0.00	0
	20:00	21:00	25.7	86	2.2	ENE	67.5	766.80	0.00	0
	21:00	22:00	25.8	84	2.2	ENE	67.5	767.00	0.00	0
	22:00	23:00	25.3	85	1.8	E	90.0	767.30	0.00	0
	23:00l	0:00	25.1	86	1.8	ENE	67.5	766.90	0.00	0
11/12/2007	0:00	1:00	23.9	90	1.3	ENE	67.5	766.50	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/12/2007	1:00	2:00	23.1	93	0.4	NNE	22.5	765.80	0.00	0
	2:00	3:00	23	91	0	NE	45.0	765.70	0.00	0
	3:00	4:00	23.3	90	0.4	NNE	22.5	765.90	0.00	0
	4:00	5:00	22.4	92	0	E	90.0	766.30	0.00	0
	5:00	6:00	22	93	0.4	NE	45.0	766.90	0.00	0
	6:00	7:00	22.9	94	0	NE	45.0	767.60	0.00	42
	7:00	8:00	26.3	82	0.4	ENE	67.5	767.90	0.00	253
	8:00	9:00	28.4	75	2.2	NE	45.0	768.20	0.00	490
	9:00	10:00	30	67	3.6	ENE	67.5	768.00	0.00	693
	10:00	11:00	30.4	65	3.1	ENE	67.5	767.80	0.00	666
	11:00	12:00	30.9	63	2.7	E	90.0	766.70	0.00	768
	12:00	13:00	31.1	65	3.1	ENE	67.5	766.10	0.00	814
	13:00	14:00	31.3	59	3.1	ENE	67.5	765.40	0.00	621
	14:00	15:00	30.2	67	2.7	ENE	67.5	765.00	0.00	453
	15:00	16:00	29.2	70	3.1	ENE	67.5	765.10	0.00	286
	16:00	17:00	28.1	75	3.1	ENE	67.5	765.10	0.00	137
	17:00	18:00	26.4	82	1.8	ENE	67.5	765.40	0.00	17
	18:00	19:00	26	84	0.9	ENE	67.5	765.70	0.00	0
	19:00	20:00	25	89	1.3	ESE	112.5	766.30	0.00	0
	20:00	21:00	25.1	87	0.9	E	90.0	766.50	0.00	0
	21:00	22:00	24.6	87	1.8	ENE	67.5	766.60	0.00	0
	22:00	23:00	23.9	90	0.4	E	90.0	766.40	0.00	0
	23:00	0:00	23.6	92	0	E	90.0	766.10	0.00	0
11/13/2007	0:00	1:00	23.9	92	0.9	ENE	67.5	765.70	0.00	0
	1:00	2:00	24.2	91	1.3	ENE	67.5	765.20	0.00	0
	2:00	3:00	23.5	93	0.9	NE	45.0	765.00	0.00	0
	3:00	4:00	23.6	93	0.9	NE	45.0	764.80	0.25	0
	4:00	5:00	23.4	94	0.9	NE	45.0	765.00	1.52	0
	5:00	6:00	23.7	94	0.9	ENE	67.5	765.50	1.02	0
	6:00	7:00	24.1	94	0.4	E	90.0	766.10	0.51	22
	7:00	8:00	25.5	91	1.3	NE	45.0	766.60	0.00	177
	8:00	9:00	25.9	89	1.3	ENE	67.5	767.00	0.25	209

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/13/2007	9:00	10:00	26.6	88	0.9	E	90.0	767.00	0.00	277
	10:00	11:00	27.9	82	0.9	NE	45.0	766.50	0.00	382
	11:00	12:00	29.4	75	1.3	ESE	112.5	766.00	2.03	488
	12:00	13:00	30.2	70	1.3	S	180.0	765.20	0.00	842
	13:00	14:00	29.3	76	0.9	NW	315.0	764.40	0.00	417
	14:00	15:00	30.3	66	1.3	WSW	247.5	763.80	0.00	737
	15:00	16:00	29.9	72	1.3	WNW	292.5	763.70	0.00	432
	16:00	17:00	29.1	74	0.9	NNE	22.5	763.70	0.00	212
	17:00	18:00	26.8	83	0.9	E	90.0	764.20	0.00	17
	18:00	19:00	25.6	88	0.4	E	90.0	764.50	0.00	0
	19:00	20:00	24.9	90	0	E	90.0	765.00	0.00	0
	20:00	21:00	24.6	92	0.4	NE	45.0	765.40	0.00	0
	21:00	22:00	24.6	92	0.9	ENE	67.5	765.60	0.00	0
	22:00	23:00	24.4	92	0.9	ENE	67.5	765.50	0.00	0
	23:00	0:00	24.3	93	0.9	ENE	67.5	765.30	0.00	0
11/14/2007	0:00	1:00	24	93	0.9	NE	45.0	765.00	0.00	0
	1:00	2:00	23.8	94	0.4	NE	45.0	764.50	0.00	0
	2:00	3:00	23.4	94	0	ENE	67.5	764.50	0.00	0
	3:00	4:00	23	95	0	ENE	67.5	764.70	0.00	0
	4:00	5:00	22.9	95	0	---	---	765.00	0.00	0
	5:00	6:00	22.8	95	0	ENE	67.5	765.30	0.00	0
	6:00	7:00	24.2	96	0.4	NE	45.0	765.80	0.00	63
	7:00	8:00	26.7	88	1.3	ENE	67.5	766.40	0.00	263
	8:00	9:00	28.3	84	1.8	ENE	67.5	766.60	0.00	359
	9:00	10:00	30.6	69	2.2	E	90.0	766.50	0.00	669
	10:00	11:00	30.8	68	3.1	E	90.0	766.10	0.00	686
	11:00	12:00	30.7	71	2.7	E	90.0	765.40	0.00	885
	12:00	13:00	29.2	75	3.1	E	90.0	764.90	1.52	738
	13:00	14:00	26.8	84	2.7	E	90.0	764.60	0.25	542
	14:00	15:00	29.4	78	2.2	E	90.0	764.20	0.00	695
	15:00	16:00	29.1	77	2.7	E	90.0	763.90	0.00	365
	16:00	17:00	28	79	2.2	E	90.0	764.20	0.00	130

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/14/2007	17:00	18:00	26.3	87	0.9	E	90.0	764.60	0.00	12
	18:00	19:00	25.6	89	0.9	ENE	67.5	765.10	0.00	0
	19:00	20:00	25.2	91	1.3	ENE	67.5	765.70	0.00	0
	20:00	21:00	24.7	91	1.3	ENE	67.5	766.10	0.00	0
	21:00	22:00	24.6	92	1.8	ENE	67.5	766.20	0.00	0
	22:00	23:00	24.1	93	0.9	ENE	67.5	766.20	0.00	0
	23:00	0:00	23.7	94	0.9	NE	45.0	765.90	0.00	0
11/15/2007	0:00	1:00	23.8	94	1.3	NE	45.0	765.70	0.00	0
	1:00	2:00	23.7	94	0.4	ENE	67.5	765.30	0.00	0
	2:00	3:00	23.3	94	0	ENE	67.5	765.20	0.00	0
	3:00	4:00	23.4	95	0	ENE	67.5	765.00	0.00	0
	4:00	5:00	23.7	95	0	ENE	67.5	765.30	0.00	0
	5:00	6:00	24.2	92	0.9	ESE	112.5	765.90	0.00	0
	6:00	7:00	24.7	90	0.9	E	90.0	766.50	0.00	41
	7:00	8:00	26.7	85	1.3	ENE	67.5	766.90	0.00	190
	8:00	9:00	28.9	76	1.8	SE	135.0	767.20	0.00	558
	9:00	10:00	30.3	72	1.8	ESE	112.5	767.20	0.00	735
	10:00	11:00	29.5	76	2.7	ENE	67.5	766.70	0.00	494
	11:00	12:00	29.2	75	2.2	ESE	112.5	766.30	0.25	340
	12:00	13:00	30.8	66	2.2	E	90.0	765.60	0.00	454
	13:00	14:00	24.3	91	3.6	E	90.0	766.00	6.60	170
	14:00	15:00	23.7	91	1.8	E	90.0	765.50	4.57	23
	15:00	16:00	23.9	92	0.9	ENE	67.5	765.30	0.76	49
	16:00	17:00	24.7	92	2.2	ENE	67.5	765.60	0.00	62
	17:00	18:00	24.5	93	1.8	ENE	67.5	766.00	0.00	13
	18:00	19:00	24.4	92	1.8	E	90.0	766.30	0.00	0
	19:00	20:00	24.7	92	2.2	E	90.0	766.40	0.00	0
	20:00	21:00	24.5	91	1.3	E	90.0	766.50	0.00	0
	21:00	22:00	24.1	92	0	E	90.0	766.30	0.00	0
	22:00	23:00	23.9	93	0	---	---	766.30	0.00	0
	23:00	0:00	23.6	94	0	---	---	766.30	0.00	0
11/16/2007	0:00	1:00	23.6	94	0.4	NE	45.0	765.90	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/16/2007	1:00	2:00	24.7	94	1.3	NE	45.0	765.50	0.00	0
	2:00	3:00	24.9	93	1.3	E	90.0	765.40	0.00	0
	3:00	4:00	24.8	92	0.9	E	90.0	765.80	1.27	0
	4:00	5:00	23.8	91	1.8	ESE	112.5	765.80	5.08	0
	5:00	6:00	24.1	93	1.3	E	90.0	766.00	0.25	1
	6:00	7:00	25.9	92	0	E	90.0	766.40	0.00	66
	7:00	8:00	28.2	85	0.9	E	90.0	766.80	0.00	278
	8:00	9:00	29.3	80	2.2	E	90.0	767.00	0.00	540
	9:00	10:00	30.6	75	2.2	ESE	112.5	766.70	0.00	762
	10:00	11:00	30.9	72	2.2	ESE	112.5	766.50	0.00	791
	11:00	12:00	31.8	65	2.7	E	90.0	765.90	0.00	972
	12:00	13:00	32.1	63	2.2	ESE	112.5	765.20	0.00	946
	13:00	14:00	32	65	2.2	ESE	112.5	764.50	0.00	780
	14:00	15:00	30.8	67	2.2	ESE	112.5	764.40	0.00	642
	15:00	16:00	29.1	72	2.2	ESE	112.5	764.60	0.00	273
	16:00	17:00	27.9	78	1.3	SE	135.0	764.70	0.00	135
	17:00	18:00	26.4	84	0.9	ESE	112.5	765.00	0.00	21
	18:00	19:00	25.7	87	0.4	ESE	112.5	765.40	0.00	0
	19:00	20:00	25	89	0.4	E	90.0	765.70	0.00	0
	20:00	21:00	24.5	92	0.4	NE	45.0	766.00	0.00	0
	21:00	22:00	24.2	93	0.4	NE	45.0	766.20	0.00	0
	22:00	23:00	24.4	91	0.9	ENE	67.5	766.10	0.00	0
	23:00	0:00	24.3	92	0.4	ENE	67.5	766.20	0.00	0
11/17/2007	0:00	1:00	24.3	93	0.4	ENE	67.5	765.80	0.00	0
	1:00	2:00	24.5	92	0.9	ENE	67.5	765.20	0.00	0
	2:00	3:00	24.4	92	0.9	NE	45.0	765.00	0.00	0
	3:00	4:00	24.2	93	0.4	ENE	67.5	764.90	0.00	0
	4:00	5:00	24.6	92	0.9	ENE	67.5	765.50	0.00	0
	5:00	6:00	24.1	93	1.3	SE	135.0	766.00	0.00	0
	6:00	7:00	23.6	93	1.3	SE	135.0	767.00	0.51	8
	7:00	8:00	23.5	90	1.8	S	180.0	767.30	1.27	53
	8:00	9:00	24.1	87	0.4	SSE	157.5	768.00	0.00	119

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/17/2007	9:00	10:00	25.1	86	0.4	SSE	157.5	768.20	0.25	163
	10:00	11:00	25.8	86	0.4	ESE	112.5	767.90	0.00	211
	11:00	12:00	26.1	83	0	SSE	157.5	767.40	0.00	211
	12:00	13:00	26.6	84	0.4	E	90.0	767.00	0.00	204
	13:00	14:00	26.2	87	1.3	NE	45.0	766.40	0.00	218
	14:00	15:00	25.8	87	1.3	NE	45.0	766.20	0.00	191
	15:00	16:00	26.7	82	0.4	ENE	67.5	765.90	0.00	142
	16:00	17:00	26	85	0.4	SSE	157.5	766.30	0.00	58
	17:00	18:00	24.8	92	0.4	NE	45.0	766.60	0.00	8
	18:00	19:00	24.2	94	0.9	NE	45.0	767.00	0.00	0
	19:00	20:00	24.1	94	0.4	ENE	67.5	767.40	0.00	0
	20:00	21:00	24.5	92	1.3	ENE	67.5	767.70	0.00	0
	21:00	22:00	25.1	89	1.8	E	90.0	768.10	0.00	0
	22:00	23:00	25.3	89	1.8	ENE	67.5	767.70	0.00	0
	23:00	0:00	24.9	91	1.8	ENE	67.5	767.40	0.00	0
11/18/2007	0:00	1:00	23.8	94	0.9	NNE	22.5	767.00	0.00	0
	1:00	2:00	23.8	95	0.4	NNE	22.5	766.30	0.00	0
	2:00	3:00	24.1	95	0.9	NE	45.0	766.00	0.00	0
	3:00	4:00	24	95	0	NE	45.0	766.40	0.00	0
	4:00	5:00	23.7	95	0	NE	45.0	766.70	0.00	0
	5:00	6:00	23.9	95	0	NE	45.0	767.10	0.00	0
	6:00	7:00	25.8	89	0.9	E	90.0	767.80	0.00	74
	7:00	8:00	27.8	85	2.2	ENE	67.5	768.50	0.00	282
	8:00	9:00	28.1	81	2.7	ENE	67.5	769.00	0.00	407
	9:00	10:00	27.7	81	2.7	ENE	67.5	768.90	0.00	343
	10:00	11:00	28.5	74	3.6	ENE	67.5	768.60	0.00	836
	11:00	12:00	27.7	87	3.1	ENE	67.5	767.70	3.05	296
	12:00	13:00	29.2	83	2.2	ENE	67.5	766.70	0.76	454
	13:00	14:00	31	67	3.1	ENE	67.5	766.10	0.00	743
	14:00	15:00	29.8	75	4	ENE	67.5	765.90	0.00	553
	15:00	16:00	29.4	74	3.6	ENE	67.5	766.00	0.00	462
	16:00	17:00	28.1	78	2.7	ENE	67.5	766.50	0.00	152

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/18/2007	17:00	18:00	26.5	79	1.8	E	90.0	767.00	0.00	7
	18:00	19:00	26	84	0.9	E	90.0	767.20	0.00	0
	19:00	20:00	24.6	90	0	E	90.0	767.90	0.00	0
	20:00	21:00	24.1	92	0	ENE	67.5	768.20	0.00	0
	21:00	22:00	23.7	94	0	NNE	22.5	768.00	0.00	0
	22:00	23:00	23.3	94	0	---	---	767.80	0.00	0
	23:00	0:00	23.5	95	0.4	NNE	22.5	767.60	0.00	0
11/19/2007	0:00	1:00	23.8	94	0.4	ENE	67.5	767.40	0.00	0
	1:00	2:00	23.5	94	0	NE	45.0	766.80	0.00	0
	2:00	3:00	23.3	94	0	E	90.0	766.50	0.00	0
	3:00	4:00	23.1	95	0	E	90.0	766.50	0.00	0
	4:00	5:00	22.8	95	0	E	90.0	766.60	0.00	0
	5:00	6:00	22.7	94	0	NE	45.0	767.20	0.00	0
	6:00	7:00	24	93	0.9	NE	45.0	767.50	0.25	64
	7:00	8:00	26.4	87	1.8	ENE	67.5	768.10	0.00	279
	8:00	9:00	28.6	79	2.7	ENE	67.5	768.20	0.00	503
	9:00	10:00	29.8	71	3.6	ENE	67.5	768.10	0.00	707
	10:00	11:00	29.9	70	3.6	ENE	67.5	767.70	0.00	500
	11:00	12:00	30.2	70	3.6	ENE	67.5	766.70	0.00	835
	12:00	13:00	31.3	60	3.1	E	90.0	766.00	0.00	962
	13:00	14:00	31.3	59	3.1	ENE	67.5	765.40	0.00	827
	14:00	15:00	30.2	65	2.7	E	90.0	764.90	0.00	598
	15:00	16:00	29	66	3.1	ENE	67.5	764.80	0.00	366
	16:00	17:00	27.4	74	2.7	ENE	67.5	765.00	0.00	146
	17:00	18:00	25.4	86	0.9	E	90.0	765.10	0.00	16
	18:00	19:00	24.8	86	0.9	ENE	67.5	765.40	0.00	0
	19:00	20:00	24.1	88	0.4	ENE	67.5	765.90	0.00	0
	20:00	21:00	23.9	89	0.9	ENE	67.5	766.20	0.00	0
	21:00	22:00	22.9	91	0.9	NE	45.0	766.30	0.00	0
	22:00	23:00	22.4	93	0.9	NE	45.0	766.10	0.00	0
	23:00	0:00	22.5	92	0.4	NE	45.0	766.10	0.00	0
11/20/2007	0:00	1:00	22	94	0	NNE	22.5	765.70	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/20/2007	1:00	2:00	22	93	0.4	NE	45.0	765.30	0.00	0
	2:00	3:00	21.7	94	0	NNE	22.5	764.90	0.00	0
	3:00	4:00	21.7	94	0.4	NE	45.0	765.00	0.00	0
	4:00	5:00	21.9	94	0.4	NNE	22.5	765.20	0.00	0
	5:00	6:00	21.7	94	0.4	NE	45.0	765.60	0.00	0
	6:00	7:00	23.9	92	0.4	NE	45.0	766.20	0.00	63
	7:00	8:00	26.5	86	0.9	ENE	67.5	766.80	0.00	278
	8:00	9:00	27.3	81	1.3	NE	45.0	767.60	0.00	264
	9:00	10:00	28.8	73	1.8	ENE	67.5	767.60	0.00	304
	10:00	11:00	31	65	1.8	ENE	67.5	767.10	0.00	808
	11:00	12:00	30.1	63	2.7	ENE	67.5	766.60	0.00	581
	12:00	13:00	30.9	66	3.6	ENE	67.5	765.90	0.00	749
	13:00	14:00	31.8	64	2.2	ENE	67.5	765.00	0.00	903
	14:00	15:00	31.7	60	2.2	ENE	67.5	764.80	0.00	612
	15:00	16:00	28.7	74	1.8	NW	315.0	764.90	0.00	268
	16:00	17:00	28.8	71	0.9	E	90.0	765.30	0.00	147
	17:00	18:00	26.1	83	0.9	E	90.0	765.70	0.00	21
	18:00	19:00	25.1	88	0.4	ENE	67.5	765.90	0.00	0
	19:00	20:00	24.2	91	0	ENE	67.5	766.50	0.00	0
	20:00	21:00	24.3	91	0.4	ENE	67.5	766.90	0.00	0
	21:00	22:00	23.9	91	0.4	NE	45.0	766.90	0.00	0
	22:00	23:00	23	93	0.4	NE	45.0	766.90	0.00	0
	23:00	0:00	22.8	94	0.4	NNE	22.5	767.00	0.00	0
11/21/2007	0:00	1:00	23.2	94	0.4	ENE	67.5	766.70	0.00	0
	1:00	2:00	23.5	93	0.9	ENE	67.5	766.20	0.00	0
	2:00	3:00	23.3	92	0.9	ENE	67.5	766.00	0.00	0
	3:00	4:00	22.6	93	0.4	ENE	67.5	766.20	0.00	0
	4:00	5:00	22.4	94	0	ENE	67.5	766.60	0.00	0
	5:00	6:00	22.6	94	0	ENE	67.5	767.10	0.00	0
	6:00	7:00	23.8	92	0.4	NNE	22.5	767.80	0.00	28
	7:00	8:00	25.4	87	0.4	ESE	112.5	768.60	0.00	115
	8:00	9:00	26.9	78	2.2	ESE	112.5	768.90	0.00	269

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^0C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/21/2007	9:00	10:00	27.7	77	2.2	E	90.0	769.20	0.00	345
	10:00	11:00	28.7	73	2.2	E	90.0	768.80	0.00	443
	11:00	12:00	28.4	79	1.3	ESE	112.5	768.40	0.00	316
	12:00	13:00	29.2	73	1.3	E	90.0	767.70	0.00	314
	13:00	14:00	28.7	73	2.2	E	90.0	767.30	0.25	342
	14:00	15:00	24.7	85	2.7	S	180.0	767.20	1.02	122
	15:00	16:00	26	89	0.4	ESE	112.5	767.00	0.25	118
	16:00	17:00	26.3	88	0.4	ESE	112.5	767.10	0.00	93
	17:00	18:00	25.8	90	0	ESE	112.5	767.50	0.00	17
	18:00	19:00	25.6	89	0.4	ESE	112.5	768.00	0.00	0
	19:00	20:00	24.7	92	0	ESE	112.5	768.40	0.00	0
	20:00	21:00	23.8	93	0	ESE	112.5	768.60	0.00	0
	21:00	22:00	23.7	94	0	ESE	112.5	769.00	0.00	0
	22:00	23:00	23.7	94	0	ESE	112.5	768.70	0.00	0
	23:00	0:00	22.8	94	0	ENE	67.5	768.50	0.00	0
11/22/2007	0:00	1:00	22.7	95	0.4	NNE	22.5	768.20	0.00	0
	1:00	2:00	22.8	95	0.4	NNE	22.5	767.70	0.00	0
	2:00	3:00	23.2	95	0.4	ENE	67.5	767.50	0.00	0
	3:00	4:00	23.1	94	0.9	NE	45.0	767.70	0.00	0
	4:00	5:00	22.7	94	0.4	NE	45.0	768.00	0.00	0
	5:00	6:00	23.1	94	0	NE	45.0	768.60	0.00	0
	6:00	7:00	24.2	93	0.4	NE	45.0	769.00	0.00	51
	7:00	8:00	26.7	88	1.3	ENE	67.5	769.70	0.00	222
	8:00	9:00	28.6	79	2.2	ENE	67.5	769.80	0.00	451
	9:00	10:00	30.2	69	3.6	ENE	67.5	769.80	0.25	690
	10:00	11:00	31.3	64	3.6	ENE	67.5	769.10	0.00	831
	11:00	12:00	30.2	67	3.6	ENE	67.5	768.40	0.00	791
	12:00	13:00	32.2	57	3.6	ENE	67.5	767.40	0.00	804
	13:00	14:00	30.6	63	3.1	E	90.0	767.30	0.00	445
	14:00	15:00	30.7	64	3.6	ENE	67.5	766.90	0.00	477
	15:00	16:00	29	70	2.7	ENE	67.5	766.90	0.00	245
	16:00	17:00	27.6	75	1.8	ENE	67.5	767.00	0.00	69

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/22/2007	17:00	18:00	25.9	83	0.4	ENE	67.5	767.30	0.00	10
	18:00	19:00	25.3	85	0	ENE	67.5	767.60	0.00	0
	19:00	20:00	24.9	87	0.4	ENE	67.5	768.30	0.00	0
	20:00	21:00	24.4	90	0.4	ENE	67.5	768.70	0.00	0
	21:00	22:00	24.2	90	0.9	ENE	67.5	768.70	0.00	0
	22:00	23:00	23.9	91	1.3	ENE	67.5	768.40	0.00	0
	23:00	0:00	23.8	91	0.4	ENE	67.5	768.30	0.00	0
11/23/2007	0:00	1:00	23.7	91	0.9	ENE	67.5	767.90	0.00	0
	1:00	2:00	23.2	93	0.4	NE	45.0	767.40	0.00	0
	2:00	3:00	23.9	91	0	NE	45.0	767.20	0.00	0
	3:00	4:00	23.4	92	0	ENE	67.5	767.20	0.00	0
	4:00	5:00	23.5	92	0	ENE	67.5	767.50	0.00	0
	5:00	6:00	23.1	93	0.4	NNE	22.5	767.90	0.00	0
	6:00	7:00	23.7	94	0	NNE	22.5	768.60	0.00	33
	7:00	8:00	25.4	89	0.4	NNE	22.5	769.10	0.00	96
	8:00	9:00	27.5	82	0.9	ENE	67.5	769.30	0.00	224
	9:00	10:00	29	76	2.2	ENE	67.5	768.90	0.00	547
	10:00	11:00	31.1	65	4	ENE	67.5	768.40	0.00	739
	11:00	12:00	31.7	60	3.6	ENE	67.5	767.70	0.00	834
	12:00	13:00	32.2	59	3.6	E	90.0	766.80	0.00	876
	13:00	14:00	31	66	3.6	E	90.0	766.10	0.00	660
	14:00	15:00	31.1	62	3.6	E	90.0	765.80	0.00	564
	15:00	16:00	29.8	66	3.1	E	90.0	765.70	0.00	417
	16:00	17:00	28.4	71	2.7	E	90.0	766.00	0.00	160
	17:00	18:00	26.4	80	1.3	ENE	67.5	766.10	0.00	22
	18:00	19:00	25.6	85	0.9	ENE	67.5	766.60	0.00	0
	19:00	20:00	24.6	88	0.4	ENE	67.5	767.10	0.00	0
	20:00	21:00	24.3	90	0.4	ENE	67.5	767.40	0.00	0
	21:00	22:00	24	92	0	ENE	67.5	767.80	0.00	0
	22:00	23:00	23.9	91	0	ENE	67.5	767.60	0.00	0
	23:00	0:00	23.5	93	0	ENE	67.5	767.40	0.00	0
11/24/2007	0:00	1:00	23.7	92	0.4	ENE	67.5	767.10	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/24/2007	1:00	2:00	23.2	92	0.9	ENE	67.5	766.60	0.00	0
	2:00	3:00	23.4	93	0.9	ENE	67.5	766.50	0.00	0
	3:00	4:00	23.4	93	0.9	ENE	67.5	766.30	0.00	0
	4:00	5:00	23.3	93	1.3	NE	45.0	766.60	0.00	0
	5:00	6:00	23.4	94	0.9	ENE	67.5	767.10	0.00	0
	6:00	7:00	24.6	92	0.9	ENE	67.5	767.80	0.00	52
	7:00	8:00	27	85	1.3	NE	45.0	768.50	0.00	262
	8:00	9:00	28.9	75	3.1	ENE	67.5	768.90	0.00	500
	9:00	10:00	29.4	73	4	ENE	67.5	769.10	0.00	572
	10:00	11:00	28.3	88	2.7	ENE	67.5	768.70	0.51	435
	11:00	12:00	31.3	65	4	ENE	67.5	767.60	0.00	898
	12:00	13:00	29.6	72	3.6	ENE	67.5	767.20	1.27	728
	13:00	14:00	30.7	69	3.1	E	90.0	766.60	0.00	652
	14:00	15:00	28.4	86	3.1	ENE	67.5	766.40	0.76	320
	15:00	16:00	25.3	90	2.7	E	90.0	766.80	0.51	285
	16:00	17:00	24.2	92	2.7	ENE	67.5	766.60	7.11	43
	17:00	18:00	23.9	93	1.3	NE	45.0	766.30	0.00	12
	18:00	19:00	23.8	93	1.3	NE	45.0	766.90	0.00	0
	19:00	20:00	23.9	94	1.3	NE	45.0	767.10	0.00	0
	20:00	21:00	24.2	94	0.4	ENE	67.5	767.70	0.00	0
	21:00	22:00	24.1	95	0	NE	45.0	768.00	0.00	0
	22:00	23:00	24.1	94	0.4	NE	45.0	767.70	0.00	0
	23:00	0:00	24.2	94	0.9	ENE	67.5	767.40	0.00	0
11/25/2007	0:00	1:00	23.7	95	0.9	NE	45.0	766.80	0.25	0
	1:00	2:00	23.8	95	0.9	ENE	67.5	766.50	0.00	0
	2:00	3:00	23.3	94	2.2	ENE	67.5	766.10	9.91	0
	3:00	4:00	23.5	95	0.4	E	90.0	766.20	0.00	0
	4:00	5:00	23.7	94	0.9	NE	45.0	766.30	1.52	0
	5:00	6:00	23.8	93	0.4	ENE	67.5	766.70	0.25	0
	6:00	7:00	24.2	94	0	E	90.0	767.50	0.00	29
	7:00	8:00	26.1	91	0.9	ENE	67.5	768.20	0.00	184
	8:00	9:00	28.2	83	2.2	ENE	67.5	768.50	0.00	482

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/25/2007	9:00	10:00	29.6	74	3.6	E	90.0	768.50	0.00	721
	10:00	11:00	30.7	71	3.6	E	90.0	768.20	0.00	680
	11:00	12:00	30.4	66	4.0	E	90.0	767.70	0.00	770
	12:00	13:00	30.4	68	4.5	E	90.0	767.10	0.00	850
	13:00	14:00	31.1	66	4.0	E	90.0	766.40	0.00	804
	14:00	15:00	30.2	68	4.0	E	90.0	766.30	0.00	612
	15:00	16:00	29.5	71	3.6	E	90.0	766.00	0.00	434
	16:00	17:00	28.2	76	3.6	ENE	67.5	766.50	0.00	169
	17:00	18:00	26.6	84	1.8	ENE	67.5	766.60	0.00	15
	18:00	19:00	25.6	89	0.4	ENE	67.5	767.10	0.00	0
	19:00	20:00	25.6	87	1.3	ENE	67.5	767.80	0.00	0
	20:00	21:00	24.8	91	0.4	NE	45.0	768.00	0.00	0
	21:00	22:00	24.9	90	1.3	ENE	67.5	768.20	0.51	0
	22:00	23:00	24.2	91	1.3	ENE	67.5	768.20	0.00	0
	23:00	0:00	24.2	92	0.9	NE	45.0	767.70	0.00	0
11/26/2007	0:00	1:00	24.0	93	0.9	ENE	67.5	767.20	0.00	0
	1:00	2:00	23.4	94	0.4	NE	45.0	766.60	0.00	0
	2:00	3:00	23.0	94	0.4	NE	45.0	766.30	0.00	0
	3:00	4:00	22.9	94	0.4	NE	45.0	766.40	0.00	0
	4:00	5:00	22.4	94	0.0	NE	45.0	766.70	0.00	0
	5:00	6:00	22.4	95	0.0	NE	45.0	767.50	0.00	0
	6:00	7:00	23.8	94	0.0	NE	45.0	767.90	0.00	40
	7:00	8:00	26.6	86	1.3	NE	45.0	768.50	0.00	233
	8:00	9:00	28.5	76	3.1	ENE	67.5	768.80	0.00	464
	9:00	10:00	29.4	73	4.0	ENE	67.5	768.70	0.00	620
	10:00	11:00	29.6	72	4.5	ENE	67.5	768.30	0.00	629
	11:00	12:00	29.8	69	4.5	ENE	67.5	767.80	0.00	551
	12:00	13:00	31.2	64	4.9	ENE	67.5	767.00	0.00	905
	13:00	14:00	30.2	64	5.8	ENE	67.5	766.50	0.00	618
	14:00	15:00	29.8	70	5.4	ENE	67.5	766.40	0.51	601
	15:00	16:00	28.6	78	3.6	ENE	67.5	766.30	0.00	343
	16:00	17:00	27.8	77	3.6	ENE	67.5	766.70	0.25	217

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/26/2007	17:00	18:00	26.1	83	2.7	ENE	67.5	767.00	0.00	19
	18:00	19:00	25.0	89	1.3	ENE	67.5	767.50	0.00	0
	19:00	20:00	24.8	91	0.4	ENE	67.5	767.90	0.00	0
	20:00	21:00	24.5	92	0.9	ENE	67.5	768.40	0.00	0
	21:00	22:00	24.3	92	0.9	NE	45.0	768.50	0.00	0
	22:00	23:00	23.9	93	0.9	NE	45.0	768.20	0.00	0
	23:00	0:00	23.6	94	0.4	NE	45.0	767.90	0.00	0
11/27/2007	0:00	1:00	23.5	94	0.4	NE	45.0	767.60	0.00	0
	1:00	2:00	23.3	95	0.0	ENE	67.5	767.10	0.00	0
	2:00	3:00	22.9	94	0.0	ENE	67.5	766.90	0.00	0
	3:00	4:00	23.3	95	0.4	NNE	22.5	767.10	0.00	0
	4:00	5:00	23.1	94	0.4	NE	45.0	767.30	0.25	0
	5:00	6:00	23.4	91	0.9	ENE	67.5	767.60	0.00	0
	6:00	7:00	24.3	93	0.0	ENE	67.5	768.10	0.00	43
	7:00	8:00	25.4	90	0.4	ENE	67.5	768.80	0.00	113
	8:00	9:00	28.4	82	2.2	ENE	67.5	769.10	0.00	423
	9:00	10:00	29.4	74	4.0	ENE	67.5	768.90	0.00	448
	10:00	11:00	31.2	65	4.5	ENE	67.5	768.70	0.00	844
	11:00	12:00	31.1	60	4.9	ENE	67.5	768.00	0.00	947
	12:00	13:00	31.4	56	4.9	ENE	67.5	767.20	0.00	905
	13:00	14:00	30.9	60	4.9	ENE	67.5	766.50	0.00	852
	14:00	15:00	30.8	62	4.9	ENE	67.5	766.00	0.00	683
	15:00	16:00	29.6	68	4.5	ENE	67.5	766.00	0.00	419
	16:00	17:00	28.2	71	3.6	ENE	67.5	766.20	0.00	205
	17:00	18:00	26.2	82	1.3	ENE	67.5	766.50	0.00	21
	18:00	19:00	25.1	86	0.9	NE	45.0	766.80	0.00	0
	19:00	20:00	24.5	88	0.9	ENE	67.5	767.10	0.00	0
	20:00	21:00	24.0	89	0.9	ENE	67.5	767.40	0.00	0
	21:00	22:00	23.4	91	0.4	E	90.0	767.60	0.00	0
	22:00	23:00	23.8	89	1.3	ENE	67.5	767.30	0.00	0
	23:00	0:00	23.3	91	0.9	ENE	67.5	767.00	0.00	0
11/28/2007	0:00	1:00	22.5	93	0.0	ENE	67.5	766.80	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/28/2007	1:00	2:00	21.9	94	0.0	E	90.0	766.30	0.00	0
	2:00	3:00	22.7	92	0.4	NE	45.0	766.20	0.00	0
	3:00	4:00	22.1	93	0.0	NNE	22.5	766.30	0.00	0
	4:00	5:00	21.8	94	0.0	NNE	22.5	766.70	0.00	0
	5:00	6:00	22.4	93	0.4	ENE	67.5	767.10	0.00	0
	6:00	7:00	22.9	93	0.0	ENE	67.5	767.70	0.00	49
	7:00	8:00	26.4	83	0.9	ENE	67.5	768.00	0.00	265
	8:00	9:00	28.2	76	1.8	NE	45.0	768.00	0.00	489
	9:00	10:00	30.0	67	1.8	ENE	67.5	767.90	0.00	707
	10:00	11:00	30.6	62	2.7	ENE	67.5	767.50	0.00	875
	11:00	12:00	30.7	59	2.7	NE	45.0	766.90	0.00	840
	12:00	13:00	31.4	55	2.2	NE	45.0	766.30	0.00	957
	13:00	14:00	30.6	61	2.7	NE	45.0	765.90	0.00	715
	14:00	15:00	29.1	67	3.1	NE	45.0	765.60	0.00	618
	15:00	16:00	29.7	62	2.2	NE	45.0	765.50	0.00	224
	16:00	17:00	28.4	63	2.2	ENE	67.5	765.70	0.00	188
	17:00	18:00	26.1	74	1.3	E	90.0	766.00	0.00	15
	18:00	19:00	24.2	82	0.4	E	90.0	766.30	0.00	0
	19:00	20:00	23.8	86	0.4	ENE	67.5	767.00	0.00	0
	20:00	21:00	23.5	88	0.4	NE	45.0	767.20	0.00	0
	21:00	22:00	22.6	91	0.0	NE	45.0	767.40	0.00	0
	22:00	23:00	22.6	91	0.0	NE	45.0	767.20	0.00	0
	23:00	0:00	21.9	93	0.0	NE	45.0	767.20	0.00	0
11/29/2007	0:00	1:00	22.2	92	0.0	NE	45.0	766.60	0.00	0
	1:00	2:00	21.6	94	0.0	NE	45.0	766.20	0.00	0
	2:00	3:00	21.7	94	0.4	NE	45.0	765.70	0.00	0
	3:00	4:00	21.3	93	0.0	NE	45.0	765.80	0.00	0
	4:00	5:00	20.9	94	0.0	ESE	112.5	766.10	0.00	0
	5:00	6:00	20.7	95	0.0	ESE	112.5	766.40	0.00	0
	6:00	7:00	22.0	93	0.0	ESE	112.5	766.90	0.00	52
	7:00	8:00	26.1	81	0.0	NE	45.0	767.20	0.00	279
	8:00	9:00	28.1	70	1.3	NE	45.0	767.50	0.00	497

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/29/2007	9:00	10:00	28.6	66	2.2	NE	45.0	767.20	0.00	658
	10:00	11:00	29.0	62	1.8	NE	45.0	766.90	0.00	580
	11:00	12:00	28.6	70	1.8	ENE	67.5	766.20	0.00	540
	12:00	13:00	25.8	81	2.2	WNW	292.5	765.90	2.29	192
	13:00	14:00	26.4	76	1.8	NE	45.0	765.40	0.00	434
	14:00	15:00	27.9	74	1.8	NE	45.0	764.80	0.00	292
	15:00	16:00	26.9	79	1.8	E	90.0	765.10	0.00	143
	16:00	17:00	25.4	84	1.3	SSE	157.5	765.50	0.00	92
	17:00	18:00	24.7	89	0.4	SSE	157.5	765.60	0.25	53
	18:00	19:00	23.9	90	0.4	ENE	67.5	765.80	0.00	0
	19:00	20:00	23.7	90	0.4	ENE	67.5	766.30	0.00	0
	20:00	21:00	23.1	92	0.0	ENE	67.5	766.50	0.00	0
	21:00	22:00	22.4	93	0.0	ENE	67.5	766.50	0.00	0
	22:00	23:00	22.2	93	0.0	ENE	67.5	766.60	0.00	0
	23:00	0:00	22.0	94	0.0	ENE	67.5	766.60	0.00	0
11/30/2007	0:00	1:00	21.6	94	0.0	ENE	67.5	766.30	0.00	0
	1:00	2:00	21.4	94	0.0	ENE	67.5	765.80	0.00	0
	2:00	3:00	21.2	94	0.0	ENE	67.5	765.70	0.00	0
	3:00	4:00	20.6	94	0.0	ENE	67.5	765.70	0.00	0
	4:00	5:00	20.4	94	0.0	ENE	67.5	766.00	0.00	0
	5:00	6:00	20.2	95	0.0	ENE	67.5	766.80	0.00	0
	6:00	7:00	21.9	95	0.0	ENE	67.5	767.20	0.00	53
	7:00	8:00	25.9	84	0.0	ESE	112.5	767.60	0.25	257
	8:00	9:00	27.8	68	0.4	ENE	67.5	767.90	0.00	500
	9:00	10:00	28.8	68	0.9	ENE	67.5	767.80	0.00	679
	10:00	11:00	28.4	71	2.2	W	270.0	767.40	0.00	550
	11:00	12:00	29.2	65	2.7	W	270.0	766.70	0.00	916
	12:00	13:00	29.8	65	3.1	W	270.0	766.00	0.00	890
	13:00	14:00	29.6	67	3.1	W	270.0	765.50	0.00	809
	14:00	15:00	27.5	72	2.2	WNW	292.5	765.40	0.00	488
	15:00	16:00	26.9	71	2.2	E	90.0	765.30	0.00	264
	16:00	17:00	26.7	73	2.2	E	90.0	765.50	0.00	164

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	*Sampling Period*		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
11/30/2007	17:00	18:00	24.7	81	0.9	E	90.0	765.70	0.00	17
	18:00	19:00	24.0	85	0.4	E	90.0	765.90	0.00	0
	19:00	20:00	22.7	90	0.4	ENE	67.5	766.30	0.00	0
	20:00	21:00	23.1	91	0.4	NE	45.0	766.70	0.00	0
	21:00	22:00	22.8	91	0.0	NE	45.0	767.00	0.00	0
	22:00	23:00	22.8	90	0.4	NE	45.0	766.80	0.00	0
	23:00	0:00	22.3	91	0.4	NNE	22.5	766.70	0.00	0
12/01/2007	0:00	1:00	22.4	90	0.4	NNE	22.5	766.40	0.00	0
	1:00	2:00	22.6	89	0.4	ENE	67.5	766.20	0.00	0
	2:00	3:00	21.5	92	0.4	ENE	67.5	766.10	0.00	0
	3:00	4:00	20.9	93	0.0	ESE	112.5	765.90	0.00	0
	4:00	5:00	20.4	94	0.0	SE	135.0	766.50	0.00	0
	5:00	6:00	20.6	94	0.0	SE	135.0	767.00	0.00	0
	6:00	7:00	22.3	93	0.0	SE	135.0	767.30	0.00	49
	7:00	8:00	25.5	86	0.4	ESE	112.5	767.80	0.00	261
	8:00	9:00	27.8	72	0.9	NE	45.0	768.20	0.00	488
	9:00	10:00	28.4	68	0.9	NE	45.0	767.90	0.00	671
	10:00	11:00	29.9	66	2.2	W	270.0	767.40	0.00	820
	11:00	12:00	29.5	66	3.1	W	270.0	766.70	0.00	900
	12:00	13:00	29.6	66	3.6	WNW	292.5	766.20	0.00	874
	13:00	14:00	29.4	66	4.0	WNW	292.5	765.80	0.00	816
	14:00	15:00	29.5	70	4.0	WNW	292.5	765.40	0.00	669
	15:00	16:00	28.7	68	3.6	NW	315.0	765.30	0.00	464
	16:00	17:00	27.7	70	3.1	NNW	337.5	765.60	0.00	238
	17:00	18:00	26.2	76	1.8	N	0.0	765.80	0.00	30
	18:00	19:00	24.8	81	1.3	NNE	22.5	766.30	0.00	0
	19:00	20:00	24.6	81	1.3	ENE	67.5	767.00	0.00	0
	20:00	21:00	23.9	84	0.9	ENE	67.5	767.50	0.00	0
	21:00	22:00	23.8	85	0.9	ENE	67.5	767.70	0.00	0
	22:00	23:00	23.4	85	1.3	ENE	67.5	767.60	0.00	0
	23:00	0:00	22.9	87	1.3	NE	45.0	767.50	0.00	0
12/02/2007	0:00	1:00	22.6	88	1.3	ENE	67.5	767.20	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

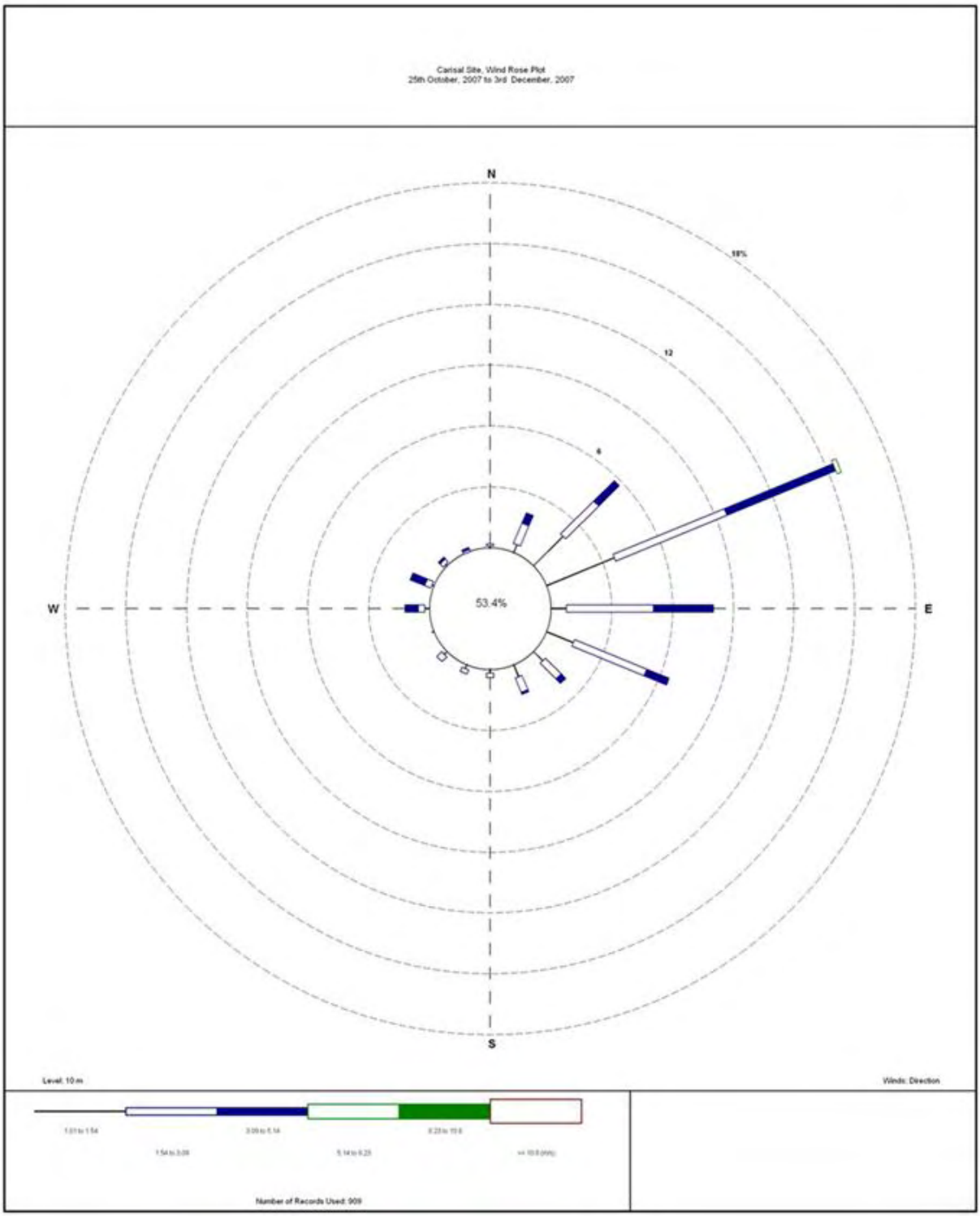
Sampling	*Sampling Period*		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
12/02/2007	1:00	2:00	22.3	89	1.3	ENE	67.5	766.90	0.00	0
	2:00	3:00	22.1	89	0.9	ENE	67.5	766.60	0.00	0
	3:00	4:00	20.8	91	0.4	SE	135.0	766.60	0.00	0
	4:00	5:00	19.8	93	0.4	SE	135.0	766.70	0.00	0
	5:00	6:00	19.9	94	0.4	SE	135.0	767.30	0.00	0
	6:00	7:00	21.5	93	0.0	SE	135.0	767.90	0.00	55
	7:00	8:00	25.8	82	0.4	ENE	67.5	768.60	0.00	277
	8:00	9:00	27.7	70	1.3	NE	45.0	768.90	0.00	502
	9:00	10:00	29.4	61	1.3	ENE	67.5	768.80	0.00	733
	10:00	11:00	28.2	70	0.9	ENE	67.5	768.50	0.00	434
	11:00	12:00	29.6	66	3.1	W	270.0	767.80	0.00	991
	12:00	13:00	30.0	70	3.1	W	270.0	767.10	0.00	946
	13:00	14:00	29.5	68	3.6	WNW	292.5	766.20	0.00	827
	14:00	15:00	29.3	67	4.0	WNW	292.5	765.90	0.00	691
	15:00	16:00	28.7	72	3.6	WNW	292.5	766.00	0.00	456
	16:00	17:00	28.4	70	2.7	NW	315.0	766.20	0.00	236
	17:00	18:00	27.0	72	0.4	SE	135.0	766.80	0.00	17
	18:00	19:00	25.1	79	0.4	ESE	112.5	767.20	0.00	0
	19:00	20:00	24.4	83	0.4	ENE	67.5	767.80	0.00	0
	20:00	21:00	24.1	83	0.9	NNE	22.5	768.30	0.00	0
	21:00	22:00	23.3	87	0.0	NNE	22.5	768.30	0.00	0
	22:00	23:00	23.1	87	0.0	NNE	22.5	768.10	0.00	0
	23:00	0:00	23.1	88	0.4	NNE	22.5	767.90	0.00	0
12/03/2007	0:00	1:00	22.2	91	0.0	ENE	67.5	767.60	0.00	0
	1:00	2:00	21.7	92	0.0	ENE	67.5	767.20	0.00	0
	2:00	3:00	21.9	91	0.4	ESE	112.5	767.00	0.00	0
	3:00	4:00	22.7	88	0.9	ENE	67.5	766.70	0.00	0
	4:00	5:00	21.3	91	0.9	ENE	67.5	767.10	0.00	0
	5:00	6:00	21.3	91	0.0	ENE	67.5	767.30	0.00	0
	6:00	7:00	21.6	93	0.0	ENE	67.5	767.60	0.00	30
	7:00	8:00	24.5	87	0.0	ENE	67.5	768.00	0.00	133
	1:00	2:00	22.3	89	1.3	ENE	67.5	766.90	0.00	0

Table 5: Meteorological data Temp, Humidity, Wind speed, Wind direction, Pressure, Rainfall, & Solar Radiation (cont'd)

Sampling	Sampling Period		*Meteorological Data*							
Date/ 2007	Start	End	Temperature ^{0}C	*Humidity* %	Wind Speed m/s	Wind Direction	Wind Direction (Degrees)	Pressure mmHg	Rain mm	Solar Radiation W/m^2
12/03/2007	8:00	9:00	27.1	72	0.0	ENE	67.5	768.60	0.00	381
	9:00	10:00	28.8	63	0.9	ENE	67.5	768.40	0.00	690
	10:00	11:00	29.7	60	1.3	NE	45.0	767.80	0.00	836
	11:00	12:00	29.8	57	2.2	WNW	292.5	767.20	0.00	687
	12:00	13:00	30.2	60	3.1	W	270.0	766.40	0.00	923
	13:00	14:00	29.6	64	3.6	WNW	292.5	765.70	0.00	824

Appendix IV

Wind Rose Plot


Carisal Site, Wind Rose Plot
25th October, 2007 to 3rd December, 2007
N
W
E
S
18%
12
6
53.4%
Level: 10 m
Winds: Direction
Number of Records Used: 909

ATTACHMENT A

Calibration Certificates

i. ***PM_{10} High Volume Sampler***

ii. ***TSP High Volume Sampler***

iii. ***$PM_{2.5}$ High Volume Sampler***

iv. ***Cl_2 Single Point Monitor***

v. ***NO_x Analyser***

vi. ***CO Analyser***

EnviroPRODUCTS
A DIVISION OF KAIZEN ENVIRONMENTAL SERVICES LIMITED

Corner Bahadoor Street,
Southern Main Rd., California
Tel .:(868) 636 - 7811
Fax.:(868) 636 - 9818 ext 37

PM10 High Volume Sampler Calibration

Date:October 11th ,2007
Technician: Robby Roopan
Location:Carisal site- Pt. Lisas

Serial# : 2480
Sampler: Tisch

Calibration Orifice

Make: Tisch
Model: TE-5007
Serial #: 674

Qactual Intercept, b1: -0.01205
Qactual Slope, m1: 0.99848
Date Certified: July 16th 2003

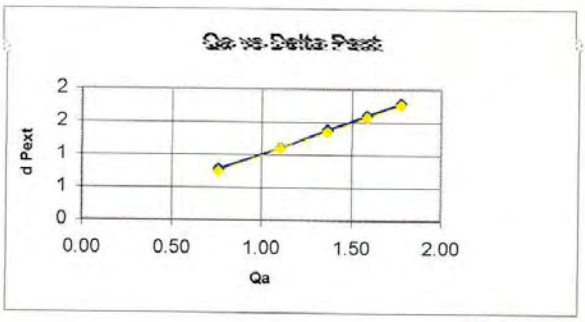
Conditions

Ta:(°C)	30	**Ta (°K)**	303	**Tstd.**	298	**Ps (mmHg)**	761.238
Pa: (" Hg.)	29.94	**Pa (mm Hg)**	760.476	**Pstd.**	760	**Ts (K)**	299

Calibrations

Manometer (H_2O)	Qactual (M^3/min)	delta Pex	delta Pext*	delta Pext
7.8	1.778	7.3	1.788	1.7629
6.2	1.586	5.9	1.607	1.5717
4.6	1.368	4.4	1.388	1.3538
3	1.107	2.8	1.107	1.0933
1.4	0.760	1.4	0.783	0.7469

slope, m2:	**0.997548**
intercept, b2:	**0.018168**
corr. coeff, r2	**0.999716**
SFR	**1.146**
SSP	**3.08**



Martin Bryan
Senior Technician

Robby Roopan
Equipment Technician

EnviroPRODUCTS
A DIVISION OF KAIZEN ENVIRONMENTAL SERVICES LIMITED

Corner Bahadoor Street,
Southern Main Rd., California
Tel .:(868) 636 - 7811
Fax.:(868) 636 - 9818 ext 37

PM10 High Volume Sampler Calibration

Date:November 16 ,2007
Technician: Sunil Bridgelal
Location:Carisal site- Pt. Lisas

Serial# : 2480
Sampler: Tisch

Calibration Orifice

Make: Tisch
Model: TE-5007
Serial #: 674

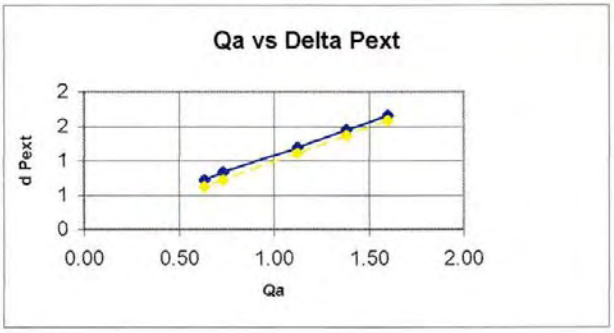
Qactual Intercept, b1: -0.01205
Qactual Slope, m1: 0.99848
Date Certified: July 16th 2003

Conditions

Ta:(°C)	30	**Ta (°K)**	303	**Tstd.**	298	**Ps (mmHg)**	761.238
Pa: (" Hg.)	29.94	**Pa (mm Hg)**	760.476	**Pstd.**	760	**Ts (K)**	299

Calibrations

Manometer (H_2O)	Qactual (M^3/min)	delta Pex	delta Pext*	delta Pext		
					slope, m2:	**0.965132**
6.3	1.599	6.3	1.661	1.5844	**intercept, b2:**	**0.115252**
4.7	1.383	4.8	1.450	1.3685	**corr. coeff, r2**	**0.999713**
3.1	1.125	3.25	1.193	1.1114		
1.3	0.733	1.6	0.837	0.7197	**SFR**	**1.146**
0.97	0.635	1.18	0.719	0.6217	**SSP**	**3.41**



S. Bridgelal
Sunil Bridgelal
Senior Technician

EnviroPRODUCTS
A DIVISION OF KAIZEN ENVIRONMENTAL SERVICES LIMITED

Corner Bahadoor Street,
Southern Main Rd., California
Tel .:(868) 636 - 7811
Fax.:(868) 636 - 9818 ext 37

TSP Sampler Calibration

Date:October 1st,2007
Technician: R. Roopan
Location: Carisal site- Pt. Lisas

Serial#: 2479
Sampler: Tisch

Calibration Orifice

Make: Tisch
Model: TE5007
Serial #: 674

Qactual Intercept, b1 -0.01205
Qactual Slope, m1 0.99848
Date Certified July 16th 2003

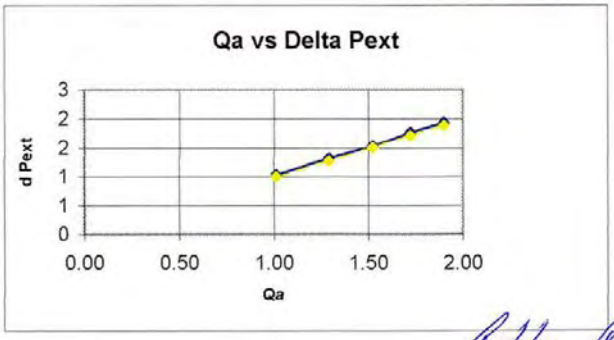
Conditions

Ta:(°C)	30	**Ta (°K)**	303	**Tstd.**	298	**Ps (mmHg)**	761.238
Pa: (" Hg.)	29.94	**Pa (mm Hg)**	760.476	**Pstd.**	760	**Ts (K)**	299

Calibrations

Manometer (H_2O)	Qactual (M^3/min)	delta Pex	delta Pext*	delta Pext
8.9	1.898	8.5	1.929	1.8831
7.3	1.720	7.1	1.763	1.7055
5.7	1.521	5.4	1.538	1.5070
4.1	1.292	4	1.323	1.2781
2.5	1.012	2.4	1.025	0.9981

slope, m2:	**1.021884**	0.892614
intercept, b2:	**-0.005476**	0.133312
corr. coeff, r2	**0.999650**	
SFR	**1.146**	
SSP	**3.10**	



Martin Bryan
Senior Technician

Robby Roopan
Equipment Technician

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Corner Bahadoor Street,
Southern Main Rd., California
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TSP Sampler Calibration

Date:November 15,2007
Technician: Sunil Bridgelal
Location: Carisal site- Pt. Lisas

Serial#: 2479
Sampler: Tisch

Calibration Orifice

Make: Tisch
Model: TE5007
Serial #: 674

Qactual Intercept, b1 -0.01205
Qactual Slope, m1 0.99848
Date Certified July 16th 2003

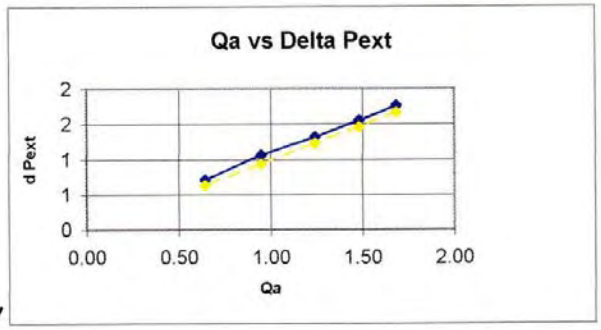
Conditions

Ta:(°C)	30	**Ta (°K)**	303	**Tstd.**	298	**Ps (mmHg)**	761.238
Pa: (" Hg.)	29.94	**Pa (mm Hg)**	760.476	**Pstd.**	760	**Ts (K)**	299

Calibrations

Manometer (H_2O)	Qactual (M^3/min)	delta Pex	delta Pext*	delta Pext
7	1.685	7.1	1.763	1.6701
5.4	1.481	5.54	1.558	1.4668
3.8	1.244	3.98	1.320	1.2305
2.2	0.950	2.58	1.063	0.9363
1	0.644	1.15	0.710	0.6312

slope, m2:	**0.996990**	0.892614
intercept, b2:	**0.085463**	0.133312
corr. coeff, r2	**0.999033**	
SFR	**1.146**	
SSP	**3.45**	



Sunil Bridgelal
Senior Technician

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PM2.5 High Volume Sampler Calibration

Date: October 1st, 2007
Technician: Robby Roopan
Location:Carisal site- Pt. Lisas

Serial# : 1328
Sampler: Tisch

Calibration Orifice

Make: Tisch
Model: TE-5007
Serial #: 674

Qactual Intercept, b1: -0.01205
Qactual Slope, m1: 0.99848
Date Certified: July 16th 2003

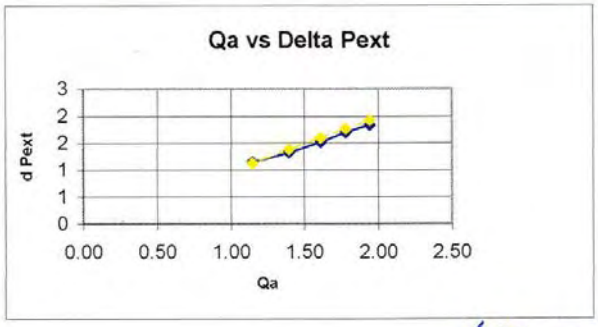
Conditions

Ta:(°C)	30	**Ta (°K)**	303	**Tstd.**	298	**Ps (mmHg)**	761.238
Pa: (" Hg.)	29.94	**Pa (mm Hg)**	760.476	**Pstd.**	760	**Ts (K)**	299

Calibrations

Manometer (H_2O)	Qactual (M^3/min)	delta Pex	delta Pext*	delta Pext
9.3	1.940	7.7	1.836	1.9250
7.8	1.778	6.6	1.700	1.7629
6.4	1.611	5.3	1.523	1.5969
4.8	1.397	4	1.323	1.3829
3.22	1.146	2.99	1.144	1.1327

slope, m2:	**0.890247**
intercept, b2:	**0.103767**
corr. coeff, r2	**0.997731**
SFR	**1.146**
SSP	**2.89**



Martin Bryan
Senior Technician

Robby Roopan
Equipment Technician

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Southern Main Rd., California
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PM2.5 High Volume Sampler Calibration

Date: November 17, 2007
Technician: Sunil Bridgelal
Location:Carisal site- Pt. Lisas

Serial# : 1328
Sampler: Tisch

Calibration Orifice

Make: Tisch
Model: TE-5007
Serial #: 674

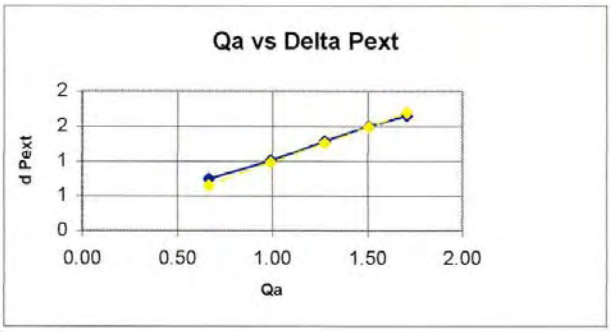
Qactual Intercept, b1: -0.01205
Qactual Slope, m1: 0.99848
Date Certified: July 16th 2003

Conditions

Ta:(°C)	30	**Ta (°K)**	303	**Tstd.**	298	**Ps (mmHg)**	761.238
Pa: (" Hg.)	29.94	**Pa (mm Hg)**	760.476	**Pstd.**	760	**Ts (K)**	299

Calibrations

Manometer (H_2O)	Qactual (M^3/min)	delta Pex	delta Pext*	delta Pext		
					slope, m2:	**0.887075**
7.2	1.708	6.24	1.653	1.6938	**intercept, b2:**	**0.148966**
5.6	1.508	5.13	1.499	1.4937	**corr. coeff, r2**	**0.999452**
4	1.276	3.81	1.292	1.2625		
2.4	0.991	2.35	1.014	0.9779	**SFR**	**1.146**
1.07	0.666	1.26	0.743	0.6530	**SSP**	**3.10**



S. Bridgelal
Sunil Bridgelal
Senior Technician

Honeywell

Honeywell Analytics Inc.
405 Barclay Boulevard
Lincolnshire, Illinois 60069 U.S.A.
www.honeywellanalytics.com
Tel: 847-955-8200
Fax: 847-955-8208
Toll-free: 800-323-2000
E mail: sales@zelana.com

SPM Certificate of Calibration

1998-0205 Rev 4

Monitor S/N: 3971
Gas Type: CL2/L0w.Level
Reference: S/N31000005766
Calibration Date: september252007
Sample Relative Humidity: 49 %
Sample Temperature: 23 °C
Procedure Number: CAL 003, Rev. 1, 1/19/94

Final Calibration Report

Average Reference Concentration	Average Monitor Response	Accuracy (Passing Range is +/- 10%)
0.0 ppb	0.0 ppb	0.0%
23.9 ppb	24.6 ppb	2.9%

The measuring devices used in this procedure are calibrated and quantified using NIST traceable reference materials. We certify that the above calibration data was compiled from the original Honeywell Analytics lab records, and that the referenced instrument meets or exceeds all published specifications.

Jay Ghayal
Calibration Lab Supervisor

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CALIBRATION CERTIFICATE

CLIENT NAME: **Carisal**

DATE: **2007-11-05**
DETAILS: Chemiluminescence NO-NO_2- NO_x Analyzer

Calibration Gas	Model #	Serial #	Date Calibrated	Response
Zero Air	42i	0730525399	2007-11-05	0 ppm

This document is to ensure that the instrument listed has been inspected, by KAIZEN Environmental Services (Trinidad) Limited and zeroed in accordance with manufacturer's specifications as outlined in the factory instruction manual and test procedures.

Tested By:

S. Bridgelal
Instrument Technician

Analyzer QA/QC Check
Cherokee Instruments, Inc.

Analyzer Type	NOx	Analyzer Asset #	2954
Analyzer Model	API Model 200A	NOx Pump Asset #	N/A
Analyzer Serial No.	100	Manual, Power and Signal Cable?	Y
Case No.	2754	Analog Output:	0-10 vDC ☐ 4-20mA ☐

Analyzer Set-up Data — Converter: MOLY

(While sampling zero gas)

Stability or Noise	0.1	ppb	(0.0-0.2)	Box Temp	35	°C	4-40 ±2dev
Sample Flow	446	cc/min	(500±50)	PMT Temp	8	°C	(7±1)
Ozone Flow	80	cc/min	(60-90)	IZS Temp	50	°C	(50±2)
PMT voltage	68	mV	(0-5000)	Converter Temp	314	°C	(315±10)
Auto Zero	66	mV	(-20 to +150)	React. Cell Press.	6.6	in. Hg	(2-10)
High Volt. Power Supply	774	volts	(450-900)	Sample Pressure	28.8	in. Hg	(25-30)
DC Power Supply Volt.	2640	mv, DC	(2500±200)	NOx Slope	0.8	---	(1.0±0.3)
Reaction Cell Temp	51	°C	(50±2)	NOx Offset	-2.3	mV	(±25)
				NO Slope	0.81	---	(1.0±0.3)
				NO Offset	-7	mV	(±25)

Analyzer Linearity/Drift Data

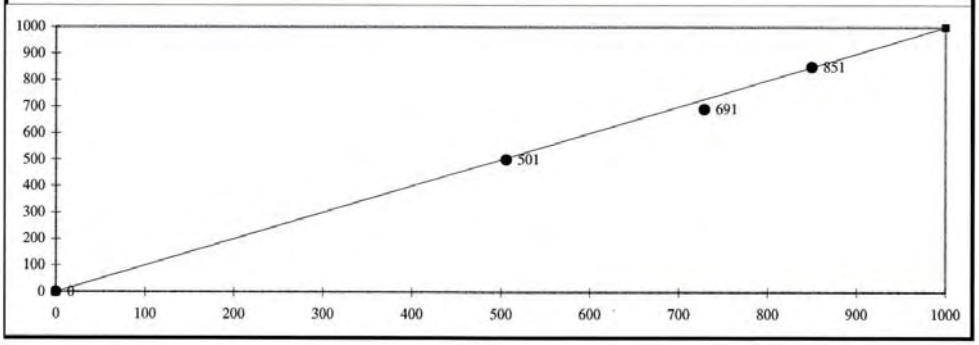
Analyzer Range: 1,000 ppb — Calibration Gas Type: NO in N2

Linearity Data

	Cal Gas Conc.	Response	Voltage resp.	Deviation (%)	Acceptable (+/- 2%)	NO2 to NO Conv. Eff.
Zero	0	0	. Vdc	0.0	Y	
(40-60% of Span)	506	501	5.02 Vdc	-0.5	Y	
(80-90% of Span)	850	851	8.52 Vdc	0.1	Y	94.8 %
NO2 for efficiency	729	691	6.9 Vdc		Y	

Drift Data

Cal Gas Conc.	Initial Response	Final Response	Elapsed Time (min)	Drift (%)	Calculated Drift after 60-minutes (%)
850	852	856	20	0.4	1.2



Technician: Jim — Date: 10/3/07

API Nox 200 A

PKR	CKR	ID #'s C# 2954	Description	Make	IN	(NOTE)
✓		Includes :	API 200 A Analyzer			
✓			Manual			
✓			QA / QC Sheet			
✓			Analog Output connector			
✓			Signal Cable			
✓			Power Cable			
✓			Front Panel Handles			
✓			Case : Includes the Above			

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CALIBRATION CERTIFICATE

CLIENT NAME: **Carisal**

DATE: **2007-11-02**
DETAILS: Gas Filter Correlation CO Analyzer

Calibration Gas	Model #	Serial #	Date Calibrated	Span Gas Conc.	Response
CO	48i	0710821552	2007-11-02	4PPM	**OK**

Instrument Range: 0 – 5ppm
Zero Air S/R Ratio Range: 1.14 < S/R <1.18
Observed S/R Ratio: 1.16

This document is to ensure that the instrument listed has been inspected, by KAIZEN Environmental Services (Trinidad) Limited and zeroed and calibrated in accordance with manufacturer's specifications as outlined in the factory instruction manual and test procedures.

Tested By:

S. Bridgelal
Instrument Technician

ATTACHMENT B

Quality Control/Assurance

i. PM_{10} High Volume Sampler

ii. TSP High Volume Sampler

iii. $PM_{2.5}$ High Volume Sampler

iv. Cl_2 Single Point Monitor

v. NO_x Analyser

vi. CO Analyser

Particulate Matter-PM_{10}

The equipment utilized for the measurement of PM_{10} was in accordance with equipment specified in the USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix J Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere. This method provides for the measurement of the mass concentration of particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}) in ambient air over a 24-hour period for purposes of determining attainment and maintenance of the primary and secondary national ambient air quality standards for particulate matter as specified in Sec. 50.6 of Chapter 1. The measurement process is nondestructive, and the PM_{10} sample can be subjected to subsequent physical or chemical analyses. The obtaining of PM_{10} values entails strict laboratory procedures involving preweighing and post weighing of desiccated filters. Filters are desiccated a period of twenty-four hours (moisture equilibration) prior to obtaining of three consistent weights. The final reported concentration is obtained form the averaging of the three consistent weights. The particulate concentration reported takes into account equipment flow rate, time of operation, atmospheric pressure and temperature conditions. Procedures of filter handling include the use of latex gloves for field works and transport to minimize contamination. Samplers are routinely calibrated and compared against manufacturers specifications for ideal equipment operation.

Total Suspended Particulates-TSP

The equipment utilized for the measurement of Total Suspended Particulate (TSP) was in accordance with equipment specified in the USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix B Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method). This method provides a measurement of the mass concentration of TSP in ambient air. for determining compliance with the primary and secondary USEPA National Ambient Air Quality Standards (NAAQS) for particulate matter as specified in Sec. 50.6 and Sec. 50.7 of Chapter 1. The obtaining of TSP values entails strict laboratory procedures involving preweighing and post weighing of desiccated filters. Filters are desiccated for a period of twenty-four hours (moisture equilibration) prior to obtaining of three consistent weights. The final reported concentration is obtained from the averaging of the three consistent weights. The particulate concentration reported takes into account equipment flow rate, duration of operation, atmospheric pressure and temperature conditions. Procedures of filter handling include the use of latex gloves for field works and transport to minimize contamination. Samplers are routinely calibrated and compared against manufacturers specifications for ideal equipment operation.

Particulate Matter-$PM_{2.5}$

The equipment utilized for the measurement of $PM_{2.5}$ was in accordance with equipment specified in the USEPA's Code of Federal regulations (CFR) 40 CFR Chapter 1 Part 50 Appendix J Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere. A Retrofit kit made to be used with the same High Volume sampler as in Appendix J would be used on this sampler for separation of particles under $PM_{2.5}$ range.

The measurement process is nondestructive, and the $PM_{2.5}$ sample can be subjected to subsequent physical or chemical analyses. The obtaining of $PM_{2.5}$ values entails strict laboratory procedures involving pre-weighing and post weighing of desiccated filters. Filters are desiccated a period of twenty-four hours (moisture equilibration) prior to obtaining of three consistent

weights. The final reported concentration is obtained form the averaging of the three consistent weights. The particulate concentration reported takes into account equipment flow rate, time of operation, atmospheric pressure and temperature conditions. Procedures of filter handling include the use of latex gloves for field works and transport to minimize contamination. Samplers are routinely calibrated and compared against manufacturers specifications for ideal equipment operation.

Cl_2 SPM Monitor

Chlroine gas was measured using a Single Point Monitor (SPM) by Zellweger Analytics/ Honeywell. The monitor used in this investigation for monitoring chlorine in ambient air was calibrated and quantified using NIST traceable reference materials by Honeywell Analytics Inc. Use of this monitor included use of Standard Operating Procedures that verified instrument response to known chlorine Standards prior to monitor start up. All relevant routine checks for instrument response were done for this monitoring and the instrument functioned normally during the monitoring period.

NO_x Analyser

Nitrogen Oxides (NO, NO2 and total NOx) was measured using the Thermo 42i analyzer. The Thermo Electron Corporation Model 42i is designated by the United States Environmental Protection Agency (USEPA) as a Reference Method for the measurement of ambient concentrations of nitrogen dioxide pursuant with the requirements defined in the Code of Federal Regulations, Title 40, Part 53. The Designated Reference Method Number: RFNA-1289-074. The monitor used in this investigation for monitoring oxides of nitrogen in ambient air was calibrated by the manufacturer, Thermo Electron Corporation. Use of this monitor included use of Standard Operating Procedures that verified instrument response to known carbon monoxide standard gases prior to monitor start up. All relevant routine checks for instrument response were done for this monitoring and the instrument functioned normally during the monitoring period.

CO Analyzer

Carbon Monoxide was tested using the Thermo 48i CO analyzer. The Thermo Electron Corporation Model 48i is designated by the United States Environmental Protection Agency (USEPA) as a Reference Method for CO as set forth in the U.S. Environmental Protection Agency regulations at Title 40, Part 53 of the U.S. Code of Federal Regulations. The monitor used in this investigation for monitoring carbon monoxide in ambient air was calibrated by the manufacturer, Thermo Electron Corporation. Use of this monitor included use of Standard Operating Procedures that verified instrument response to known carbon monoxide standard gases prior to monitor start up. All relevant routine checks for instrument response were done for this monitoring and the instrument functioned normally during the monitoring period.

Hydrogen Chloride (HCL)

Hydrogen Chloride was measured using NIOSH Method 7903 for the determination of Inorganic Acids in air. This methodology for measuring HCl in ambient air consisted of various steps that included sampling, sample preparation, and laboratory analysis. Sampling was conducted using SKC personal sampling pump that was calibrated along the change of each Solid Sorbent Tube at the end of each 24-hour sampling duration. Upon sample completion, each tube was sealed and packaged appropriately and sent to the lab for analysis along with relevant chain of custody.

Calibration and Quality control procedures for the analytical phase of the measurement were followed as stipulated by the NIOSH[3] method 7903.

Sulphur Dioxide (SO_2)

The concentration of SO_2 was determined in accordance with US EPA 40 CFR Part 50 Appendix A: "*Reference Method for the Determination of Sulphur Dioxide in the Atmosphere (Pararosaniline Method)*. Sampling was conducted utilizing a SKC personal sampling pump, that bubbled the surrounding ambient air through a solution of 0.04 M potassium tetrachloromercurate (TCM), which was contained in an impinger train assembly. Sampling pumps were calibrated at the start of each twenty-four hour monitoring period. Upon completion of a given 24-hr monitoring period, the absorbing solution in the impingers were packaged, preserved and sent to the lab for analysis accompanied by relevant chain of custody forms. All sampling and analytical procedures were conducted in accordance to the above stated methodology.

[3] National Institute of Occupational Safety and Health

Air Quality Modelling Results

The Project TOR page 7, Section 2.1.2 requires the Applicant to use GIS to show locations of adjacent industrial facilities operating or planned in the area. CariSal obtained and used the most recent GIS survey map of the area readily available from official sources (the Lands and Surveys Division). CariSal used location information for the Essar project from the National Registry. Official location information for the proposed NEC Port project was unavailable during the development of CariSal's air quality dispersion maps. As such, the revised Essar and Port boundaries are not reflected in these maps.

GIS-generated maps are for illustration purposes only. They do not represent a legal survey. Every effort has been made to ensure that the map data are correct and reliable within the limits of currently available and accessible technology and relevant local data. Remote Data Concepts, DaCosta Gwendoline, Limited and ICF International cannot assume liability for any damages or injury caused by any errors or omissions in the data, nor any distortions resulting from map projection methods.

Operations

Figure 1. Annual Average Concentration PM 10 CariSal Only.
Figure 2. Annual Average Concentration PM 2.5, CariSal Only.
Figure 3. Air Quality Modelling for HCl, 30-Minute Maximum Concentration.
Figure 4. Air Quality Modelling for Cl_2, 30-Minute Maximum Concentration.
Figure 5. Air Quality Modelling for Hydrogen, 1-Hour Maximum Concentration.
Figure 6. Average Annual Maximum Concentration, Dust, CariSal Only.
Figure 7. Air Quality Modelling Average Annual Deposition, Dust, CariSal Only.
Figure 8. CariSal Air Quality Modelling Results, 24-Hour Average Concentration, TSP plus Background of 89ug/m^3.
Figure 9. CariSal Air Quality Modelling Results, 24-Hour Average Maximum Concentration, PM 10 plus Background of 60.1 ug/m3.
Figure 10. CariSal Air Quality Modelling Results Annual Average PM 10 plus Background of 25.8 ug/m3.
Figure 11. CariSal Air Quality Monitoring Results, 24-Hour plus Background of 20.8 ug/m3.
Figure 12. CariSal Air Quality Modelling Results, Annual Average Concentration PM 2.5 plus Background.
Figure 13. Air Quality Modelling, 1-Hour NO2, CariSal Only.
Figure 14. Air Quality Modelling, 1-Hour CO, CariSal Only.
Figure 15. Air Quality Modelling, 8-Hour CO, CariSal Only.
Figure 16. Air Quality Modelling, 24-Hour SO2, CariSal Only.
Figure 17. Air Quality Modelling, Annual Average SO2, CariSal Only.

Cumulative

Figure 18. Air Quality Monitoring, 24-Hour Average Concentration TSP, CariSal plus Essar and Westlake
Figure 19. Air Quality Modelling, 24-Hour Average Maximum Concentration PM 10, CariSal plus Essar and Westlake.
Figure 20. Air Quality Modelling, Average Annual Maximum Concentration PM 10, CariSal plus Essar and Westlake.

Figure 21. Air Quality Modelling, 24-Hour Average Maximum Concentration PM 2.5, CariSal plus Essar and Westlake.
Figure 22. Air Quality Modelling, Average Annual Maximum Concentration PM 2.5, CariSal plus Essar and Westlake.
Figure 23. Air Quality Modelling, 1-Hour Average Concentration NO2, CariSal plus Essar, and Westlake.
Figure 24. Air Quality Modelling, 1-Hour CO, CariSal plus Essar and Westlake.
Figure 25. Air Quality Modelling, 8-Hour CO, CariSal plus Essar and Westlake.
Figure 26. Air Quality Modelling, 24-Hour SO2, CariSal plus Essar and Westlake.
Figure 27. Air Quality Modelling, Annual Average SO2, CariSal plus Essar and Westlake.

Construction

Figure 28. Air Quality Modelling for Total Suspended Particulate, 24-Hour Maximum Concentration, CariSal Only - CONSTRUCTION
Figure 29. Air Quality Modelling for PM 10. 24-Hour Maximum Concentration, CariSal Only. - CONSTRUCTION
Figure 30. Air Quality Modelling, Annual Average PM 10, CariSal Only. - CONSTRUCTION
Figure 31. Air Quality Modelling, Annual Average PM 2.5, CariSal Only. - CONSTRUCTION
Figure 32. Air Quality Modelling, 1-Hour NO2, CariSal Only. - CONSTRUCTION
Figure 33. Air Quality Modelling, 24-Hour SO2, CariSal Only. - CONSTRUCTION
Figure 34. Air Quality Modelling, CariSal Only, 24-Hour PM 10 Worst Case Scenario, Savonetta Village, Northwest Winds, 13, July 2005.

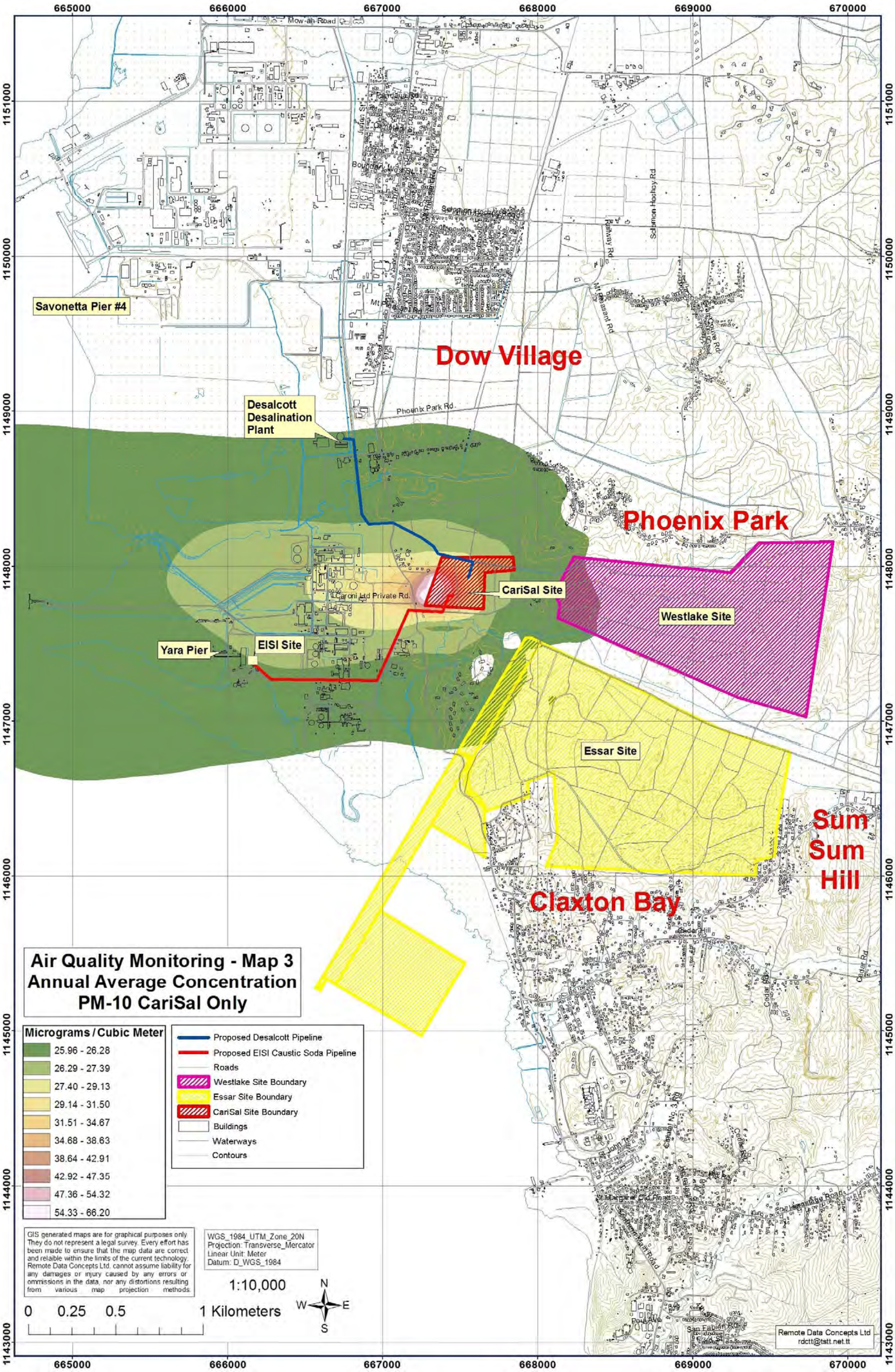

Figure 1. Annual Average Concentration PM 10 CariSal Only.

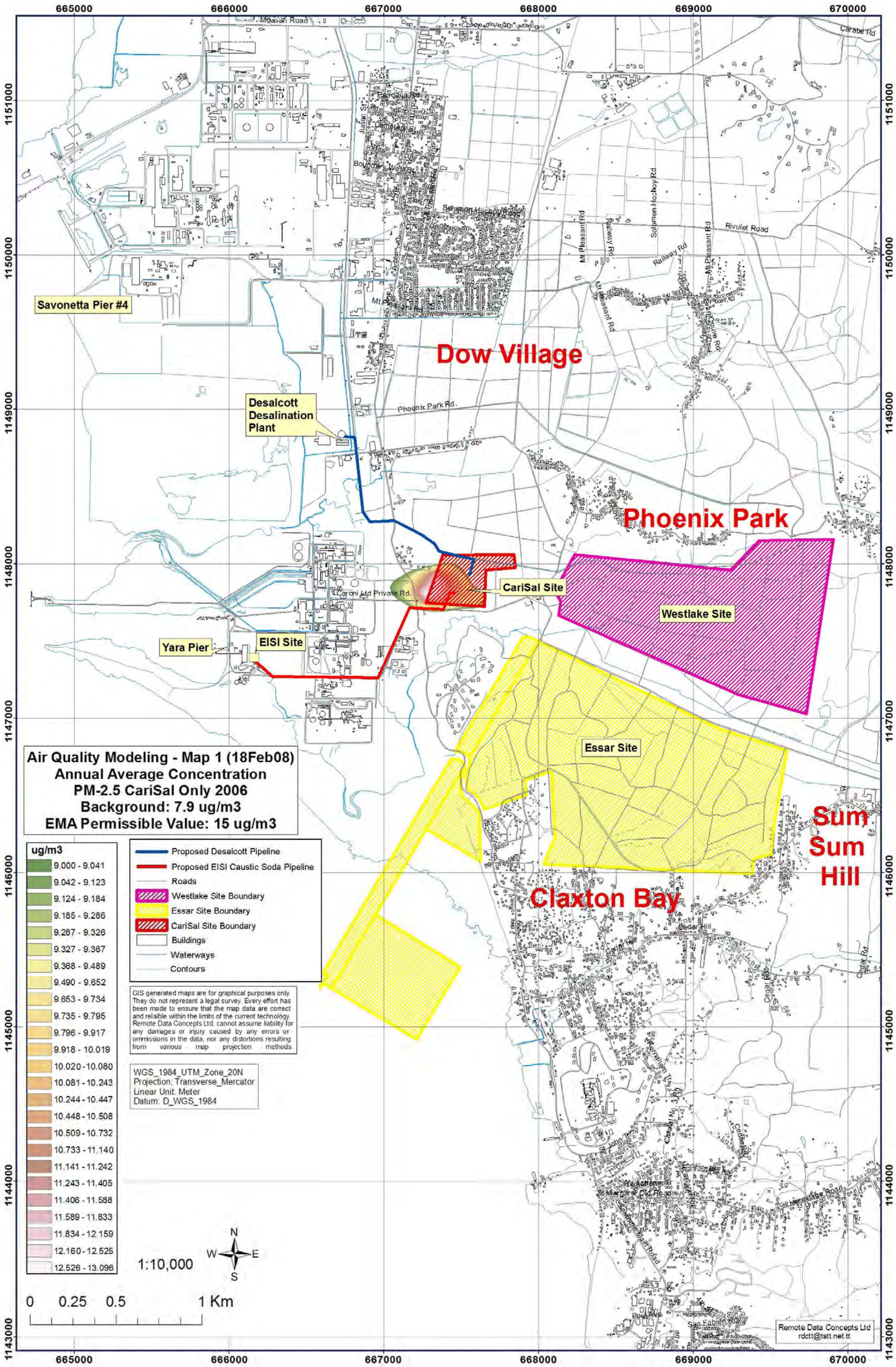

Figure 2. Annual Average Concentration PM 2.5, CariSal Only.

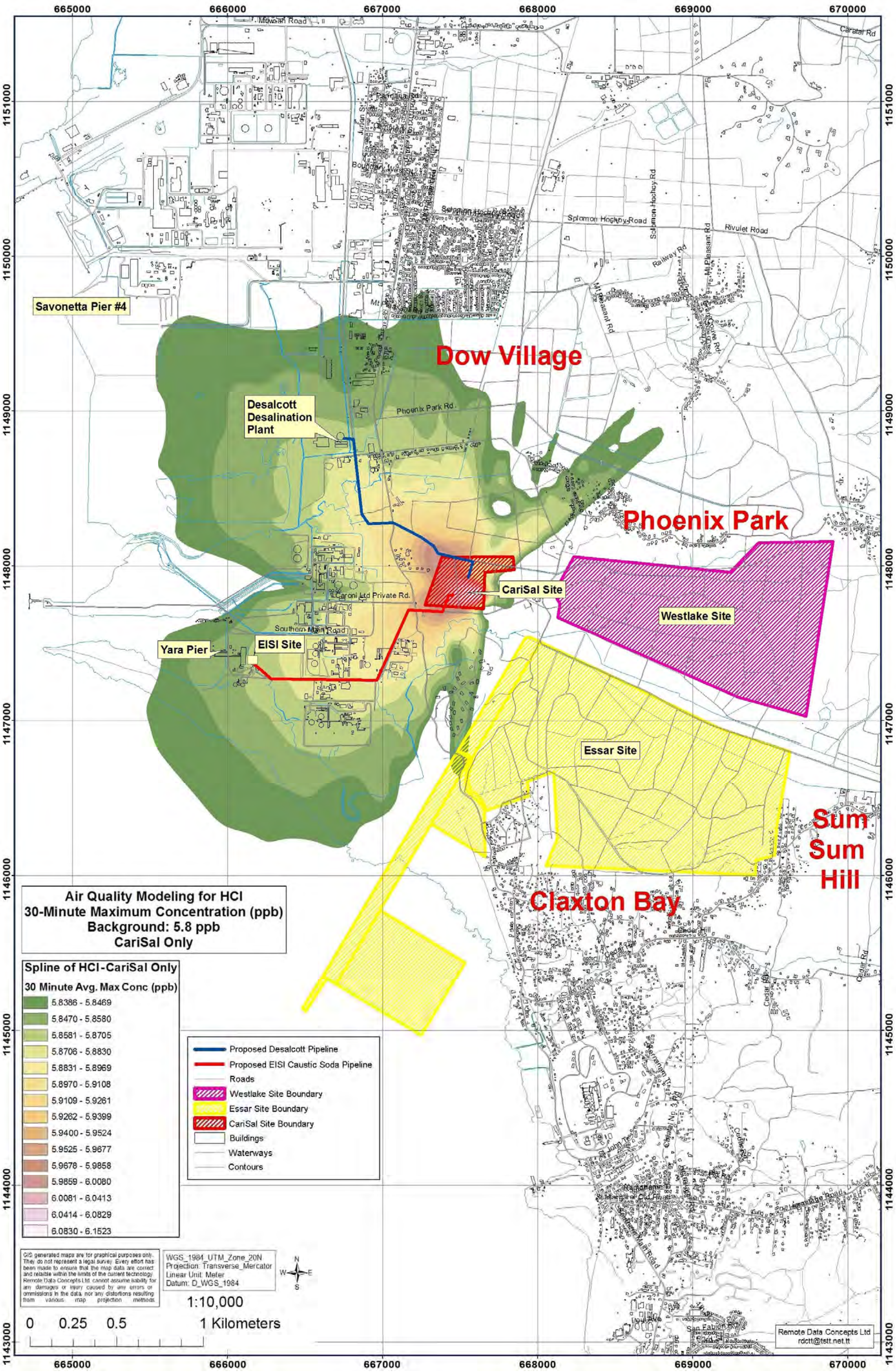

Figure 3. Air Quality Modeling for HCl, 30-Minute Maximum Concentration.

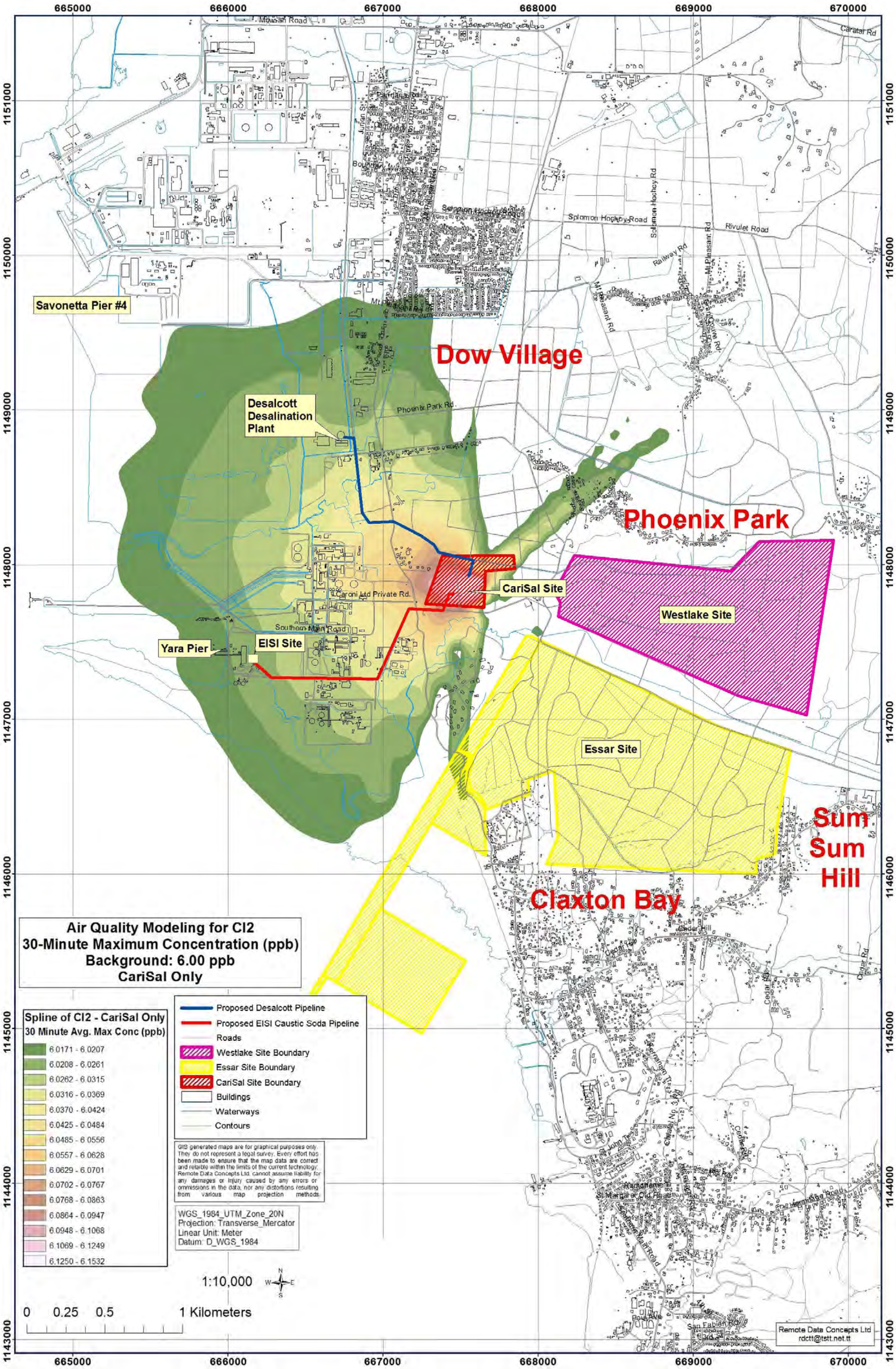

Figure 4. Air Quality Modeling for Cl_2, 30-Minute Maximum Concentration.

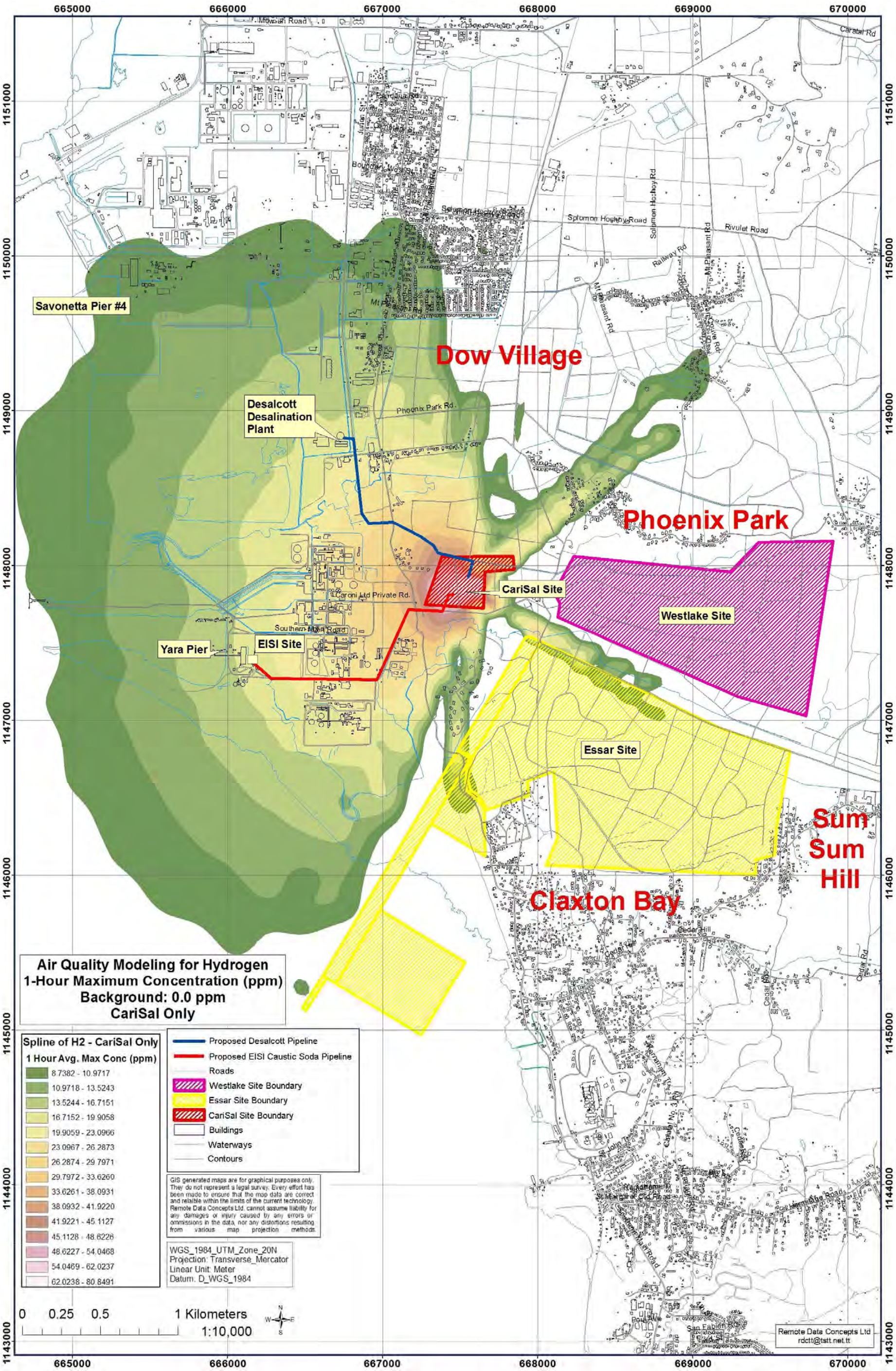

Figure 5. Air Quality Modeling for Hydrogen, 1-Hour Maximum Concentration.

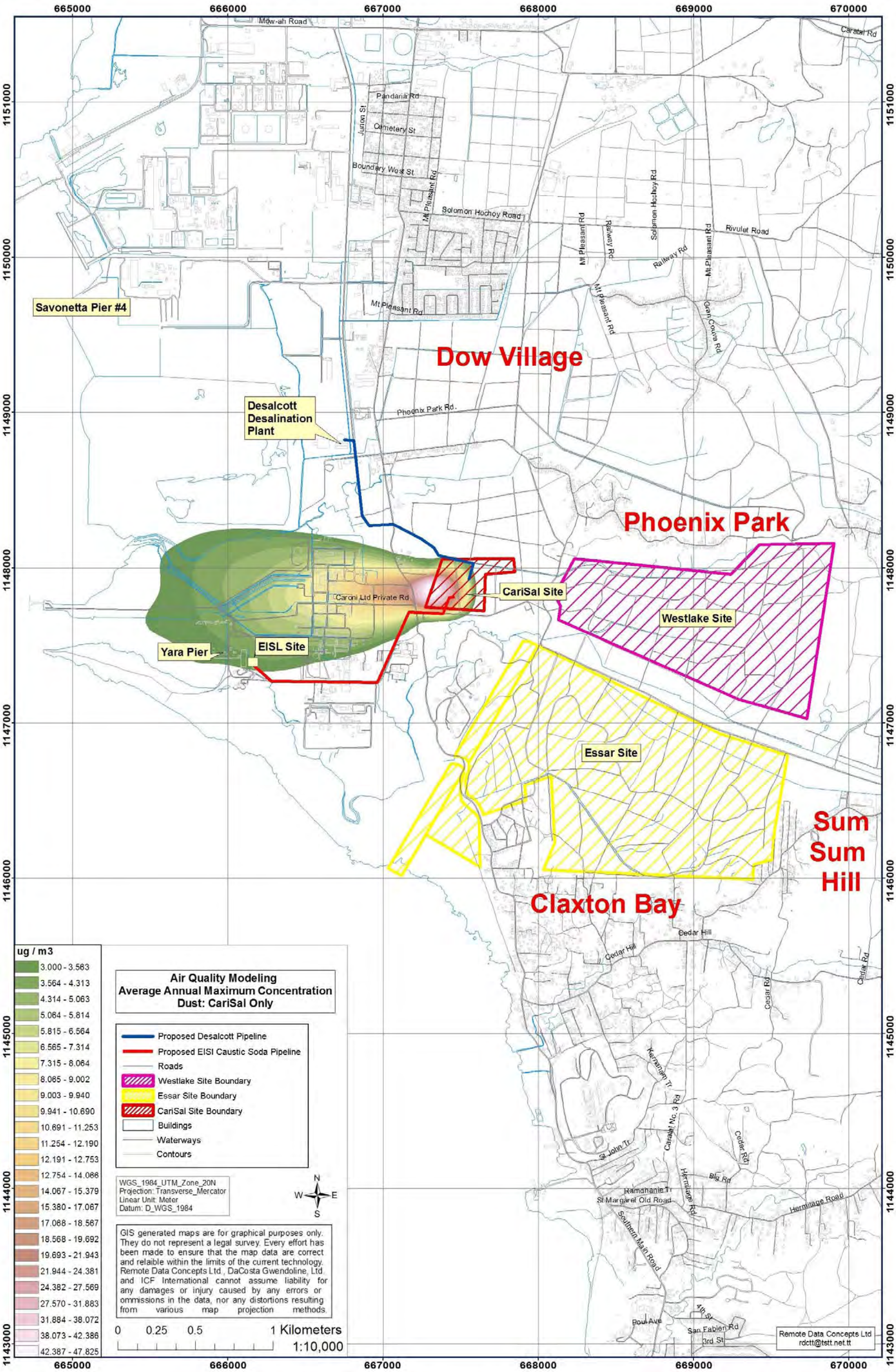

Figure 6. Average Annual Maximum Concentration, Dust, CariSal Only.

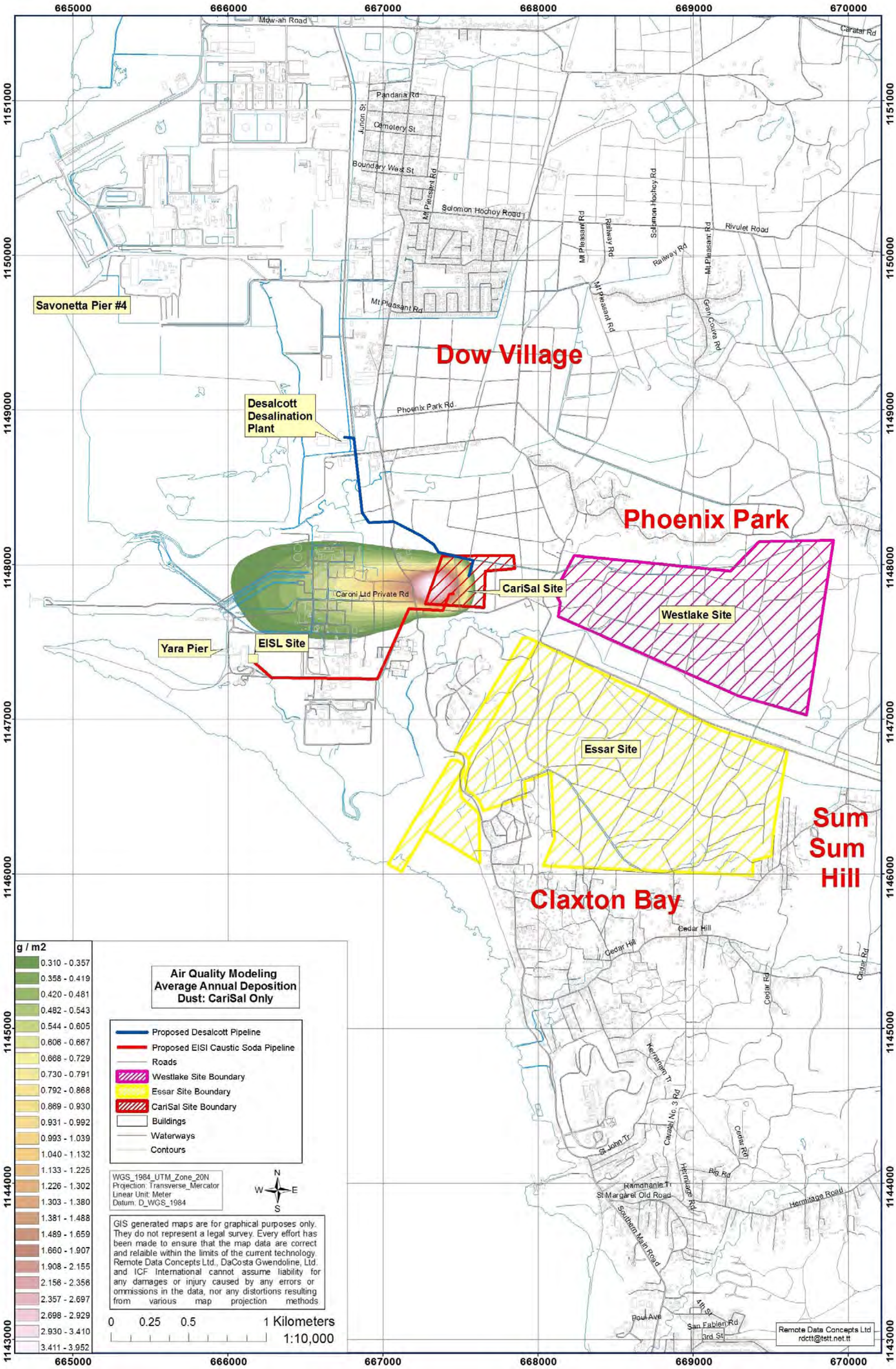

Figure 7. Air Quality Modeling Average Annual Deposition, Dust, CariSal Only.

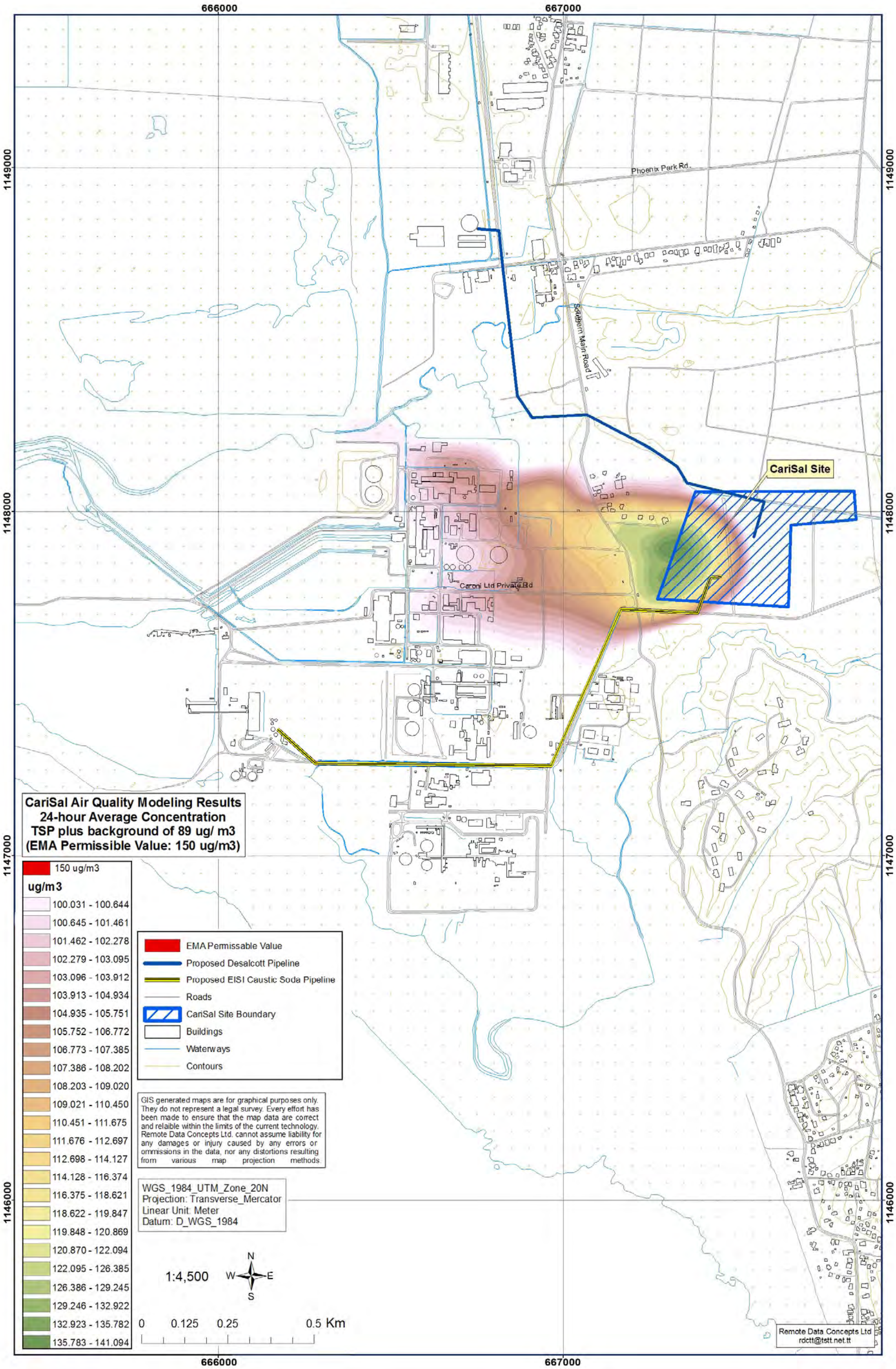

Figure 8. CariSal Air Quality Modeling Results, 24-Hour Average Concentration, TSP plus Background of 89ug/m^3.

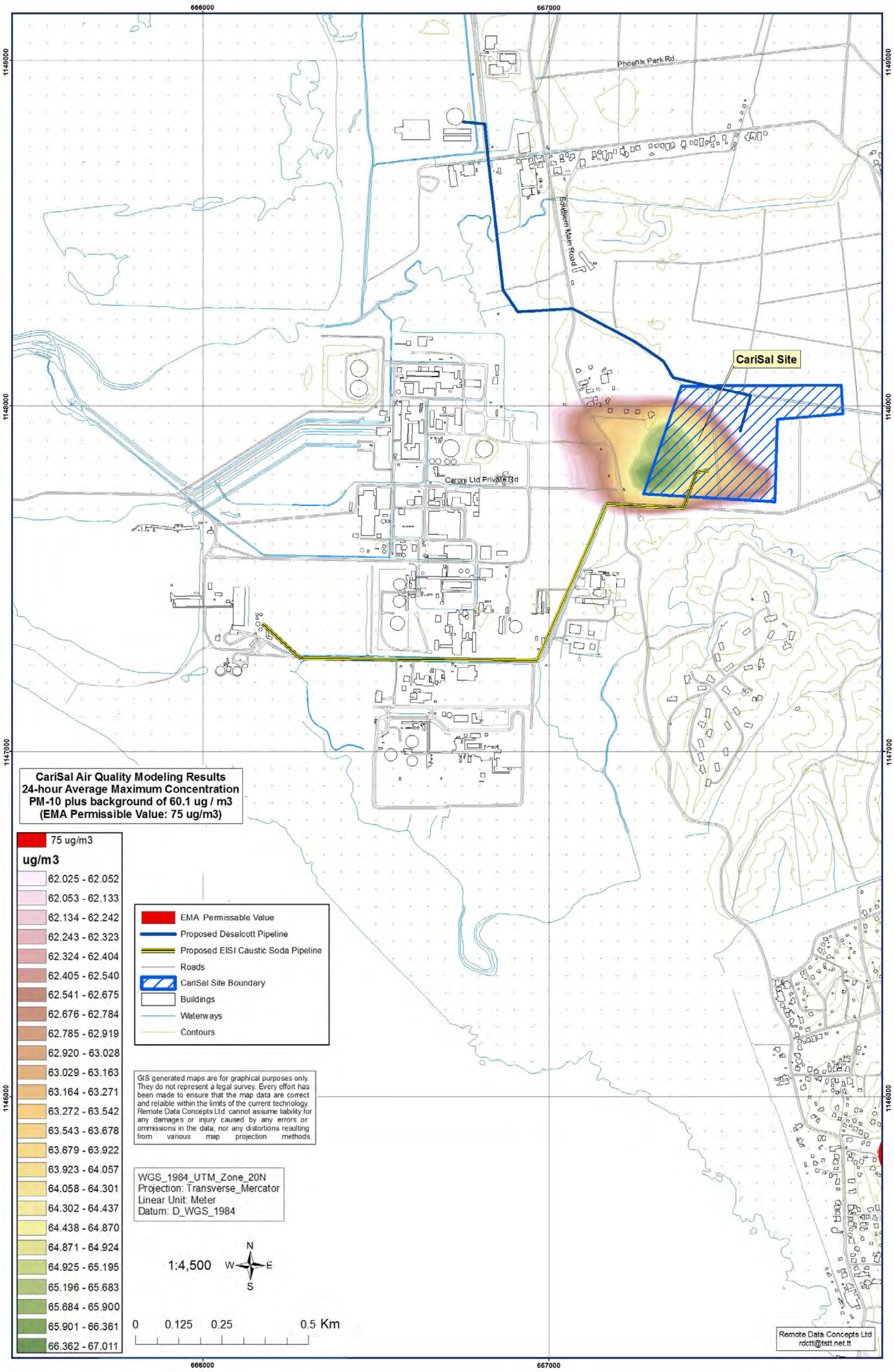

Figure 9. CariSal Air Quality Modeling Results, 24-Hour Average Maximum Concentration, PM 10 plus Background of 60.1 ug/m^3.

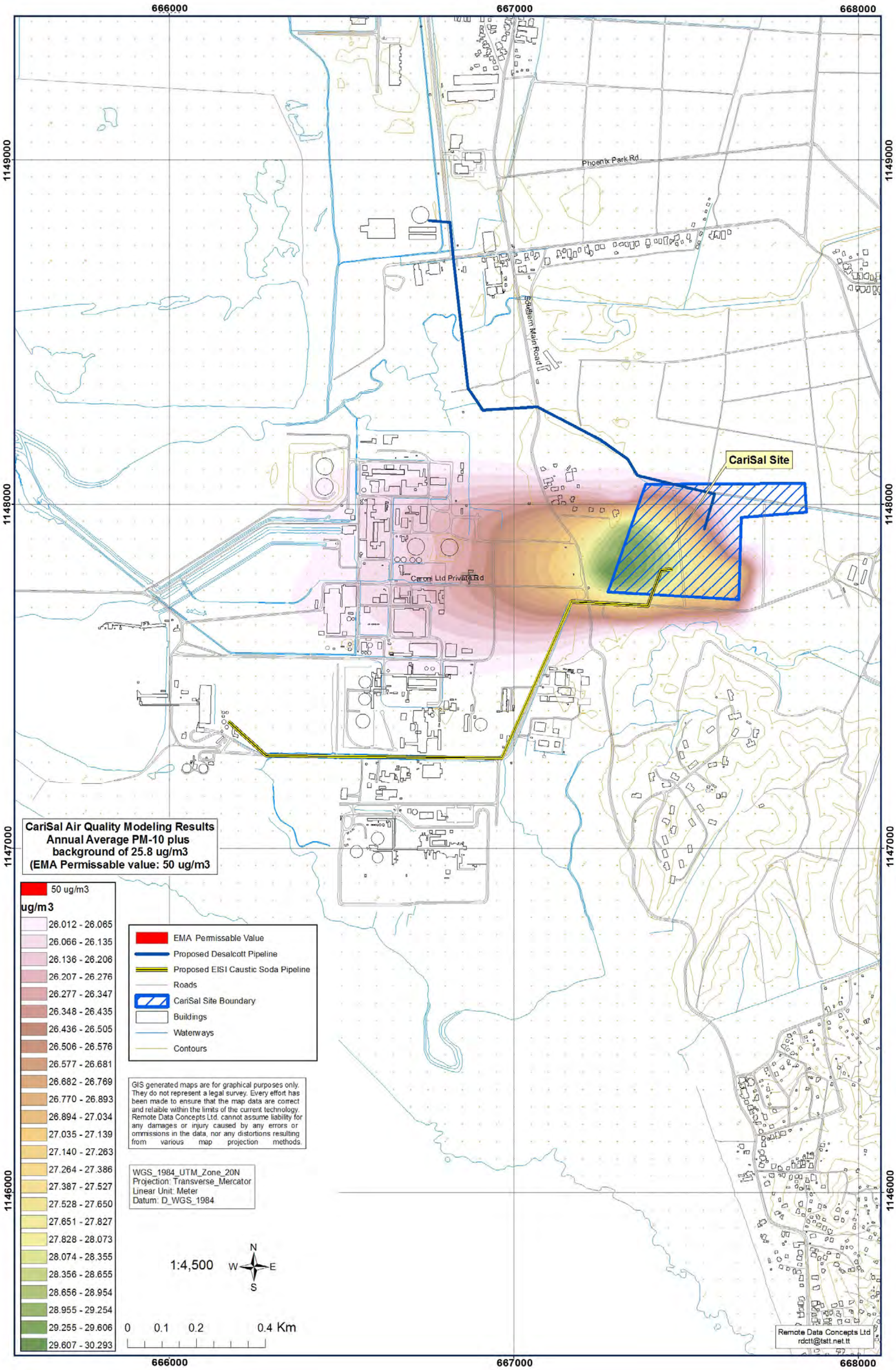

Figure 10. CariSal Air Quality Modeling Results Annual Average PM 10 plus Background of 25.8 ug/m^3.

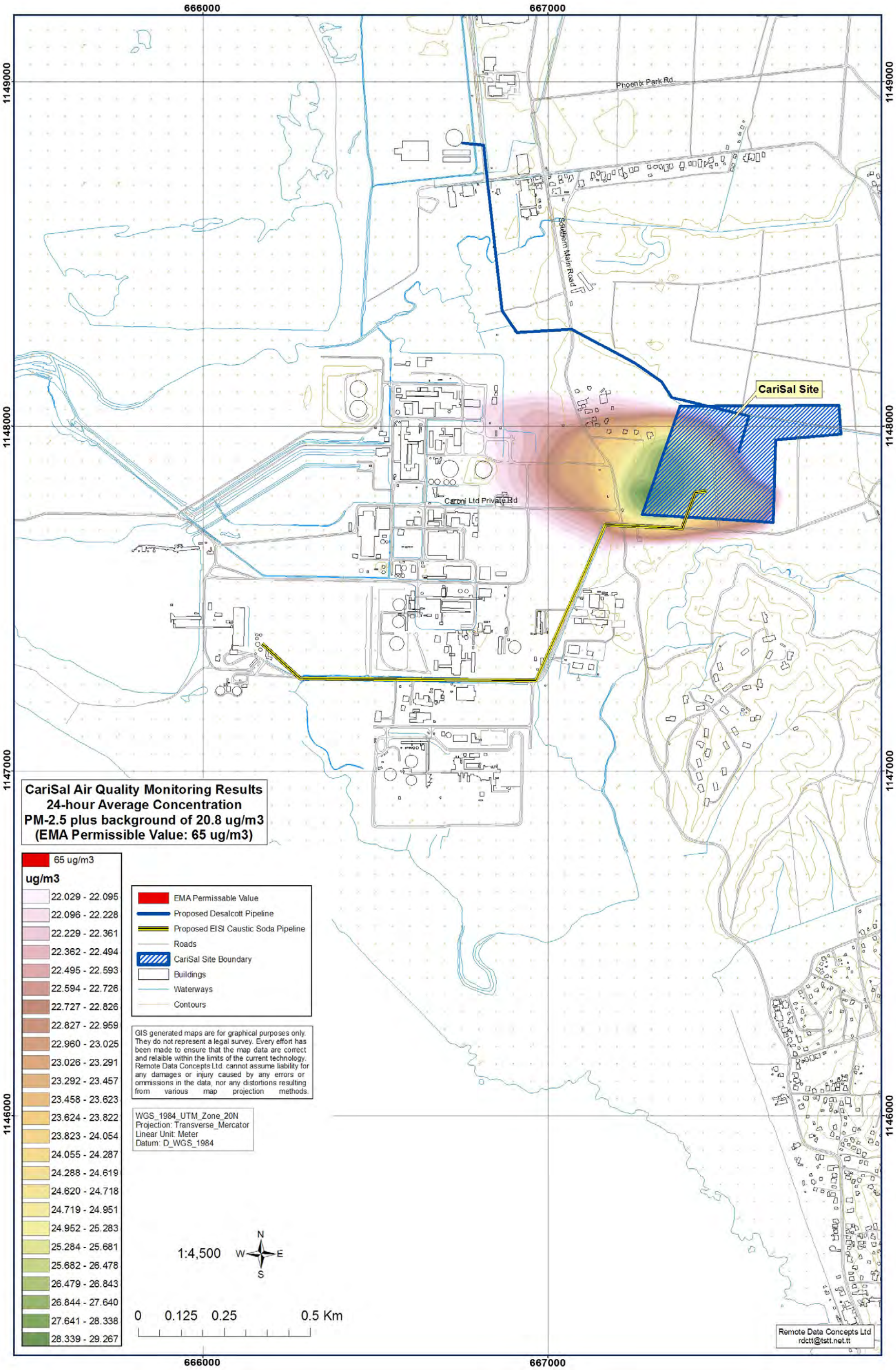

Figure 11. CariSal Air Quality Monitoring Results, 24-Hour plus Background of 20.8 ug/m^3.

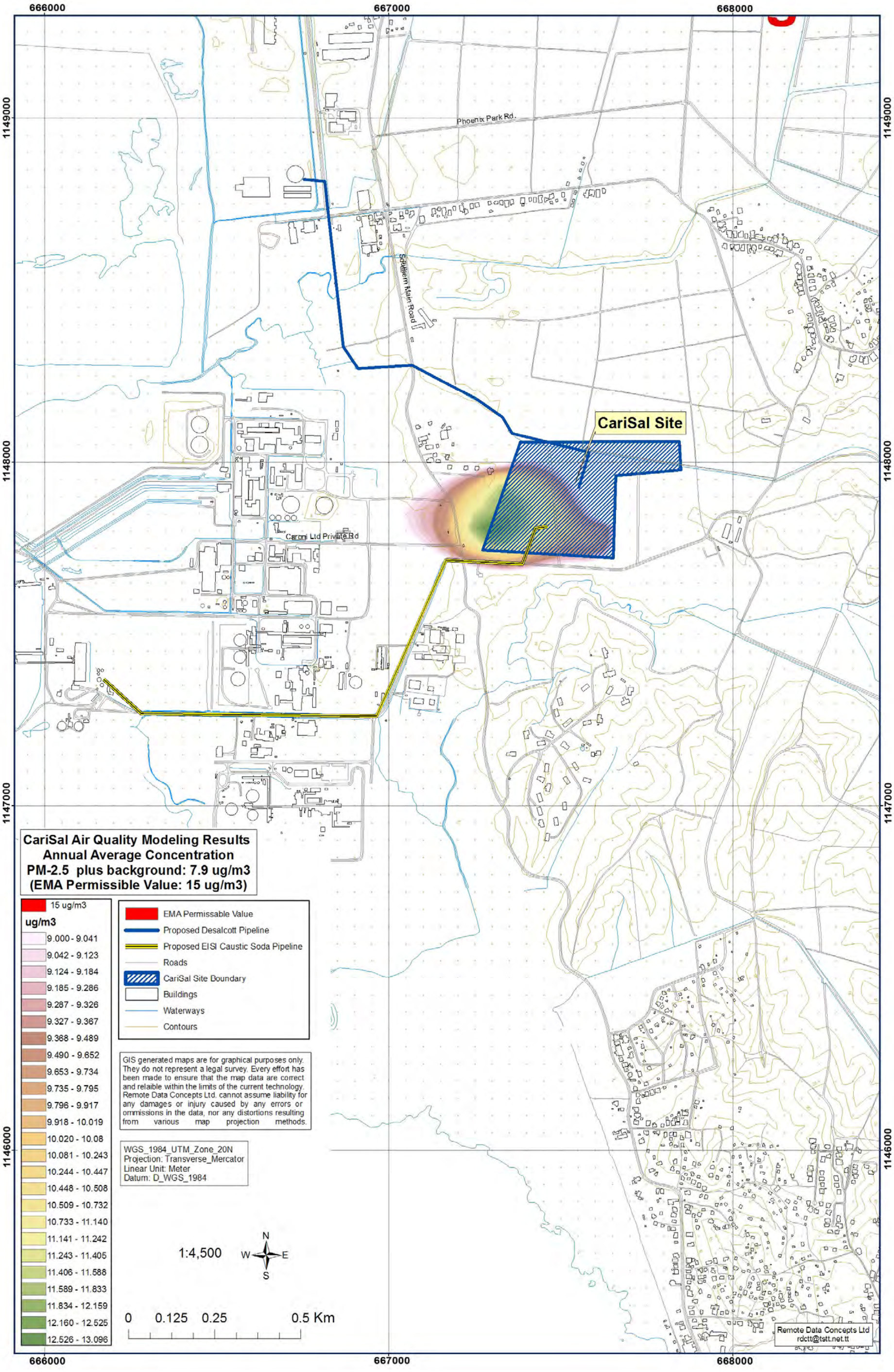

Figure 12. CariSal Air Quality Modeling Results, Annual Average Concentration PM 2.5 plus Background.

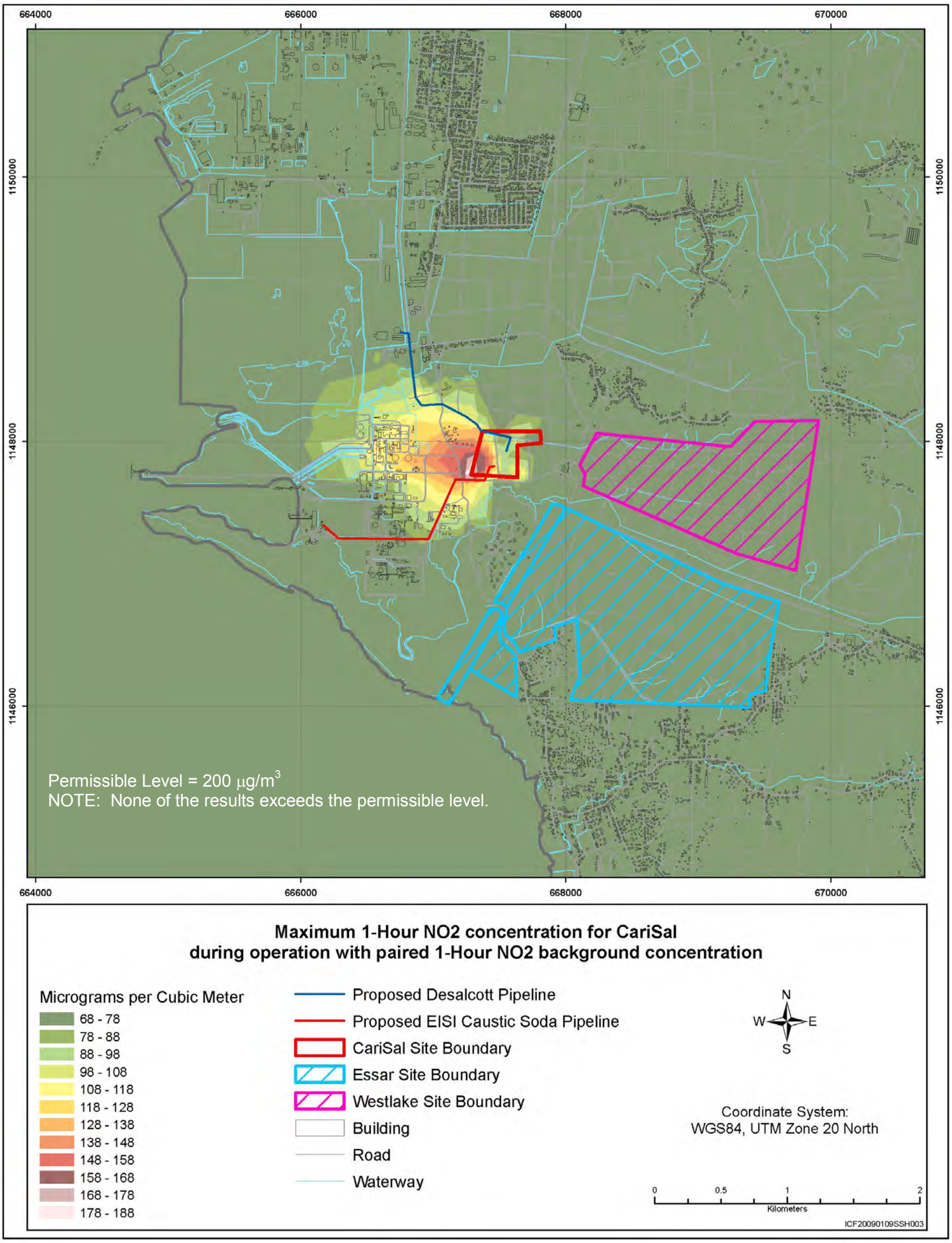

Figure 13. Air Quality Modeling, 1-Hour NO_2, CariSal Only.

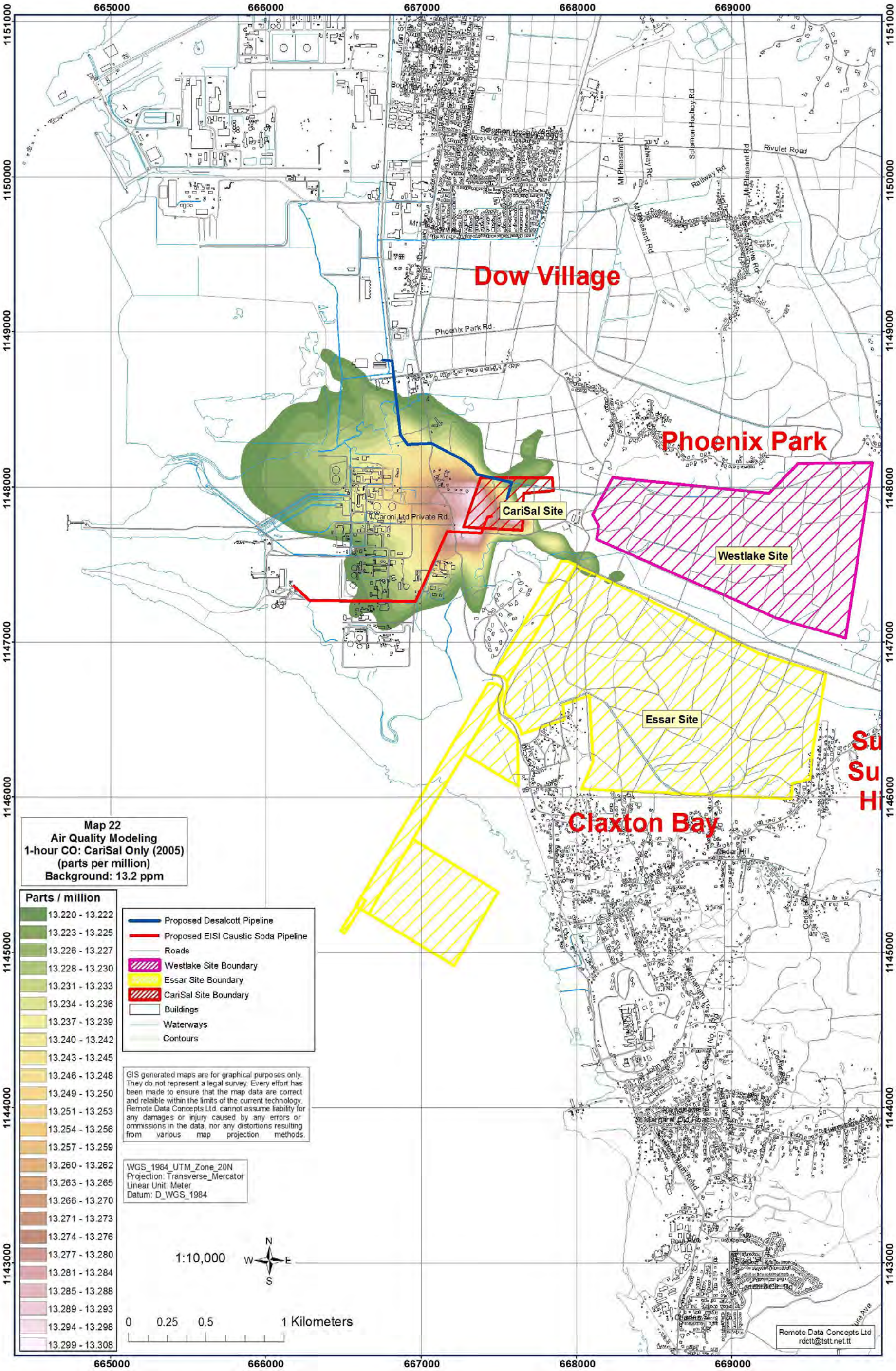

Figure 14. Air Quality Modeling, 1-Hour CO, CariSal Only.

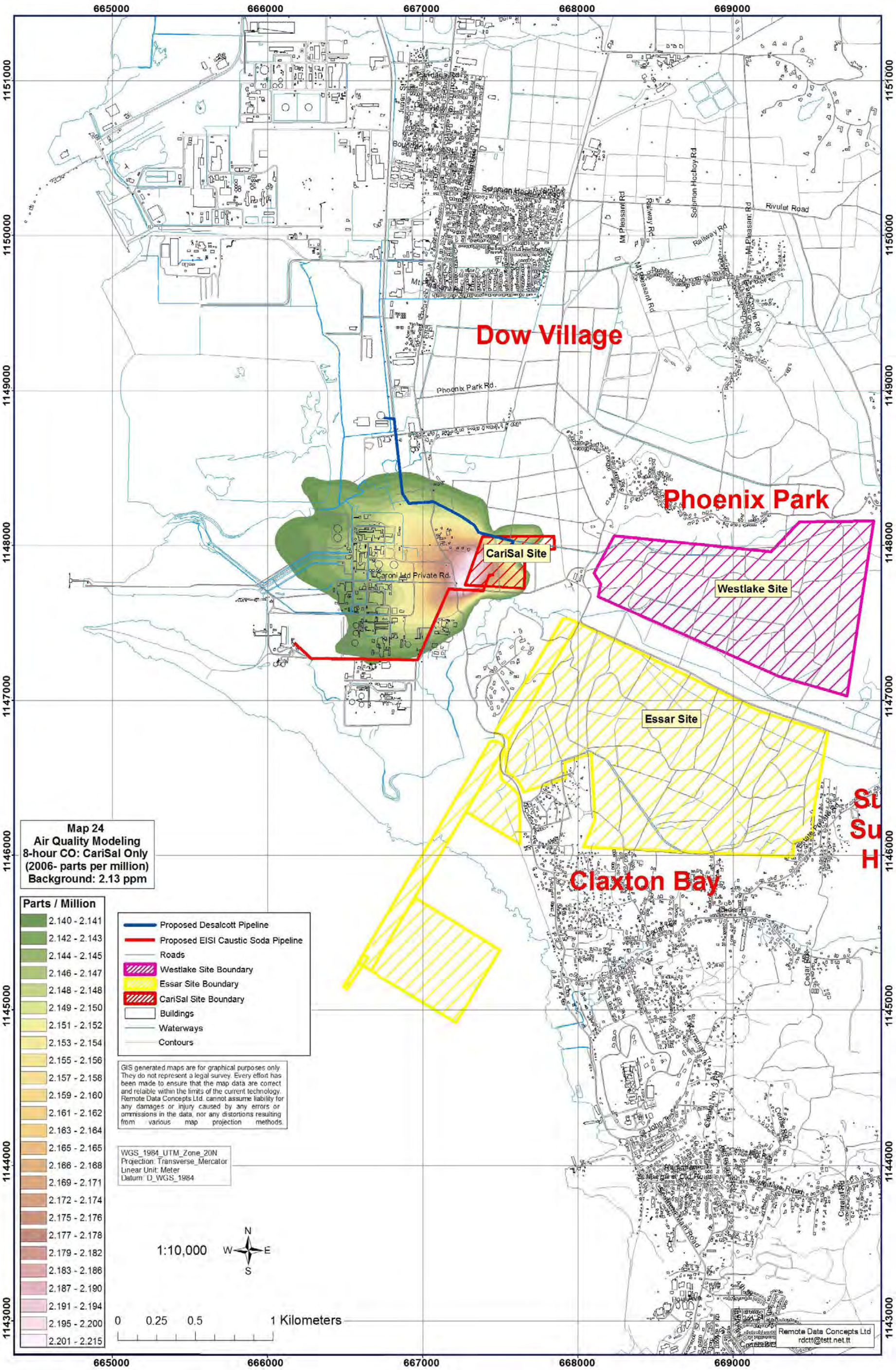

Figure 15. Air Quality Modeling, 8-Hour CO, CariSal Only.

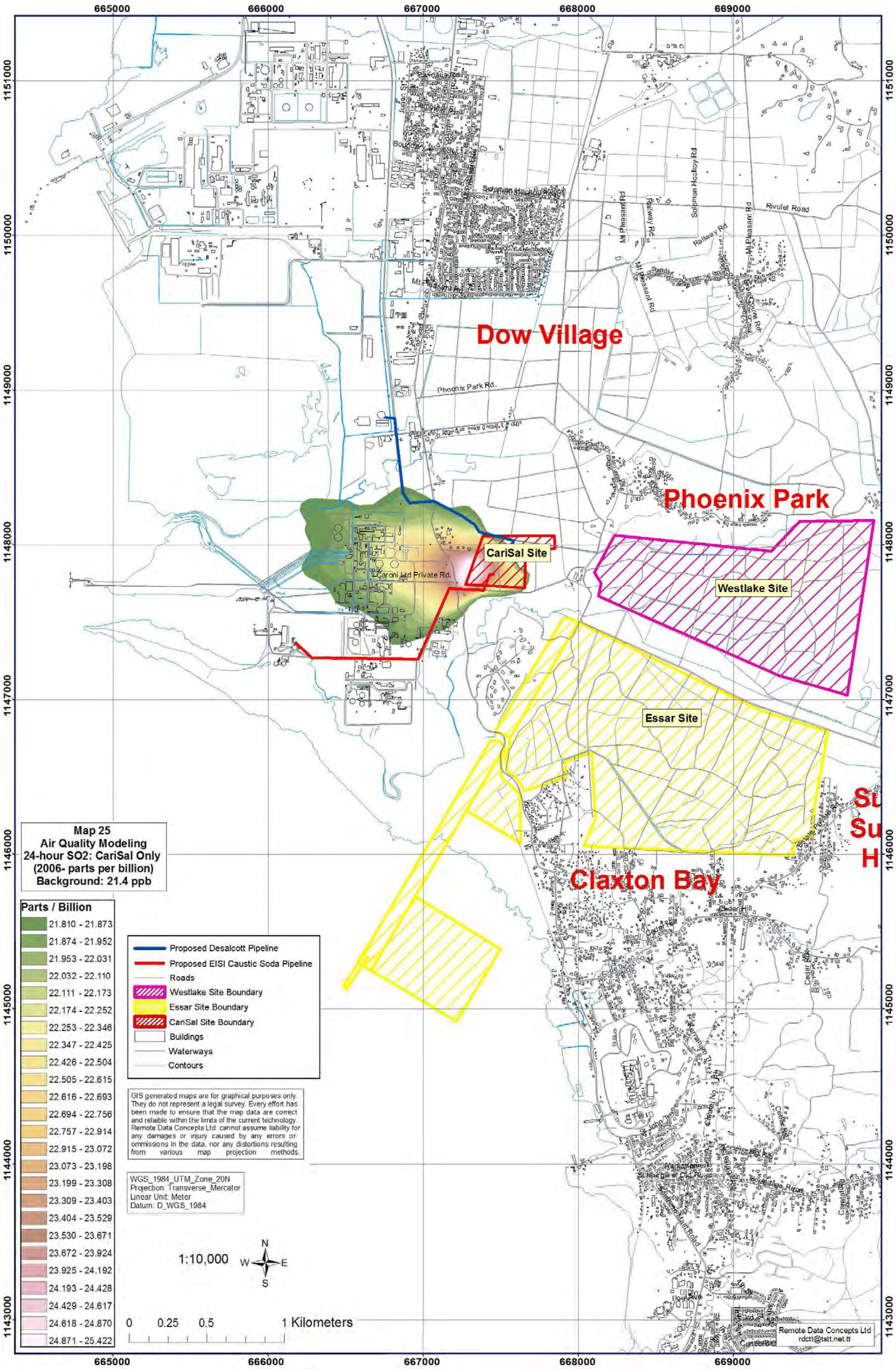

Figure 16. Air Quality Modeling, 24-Hour SO_2, CariSal Only.

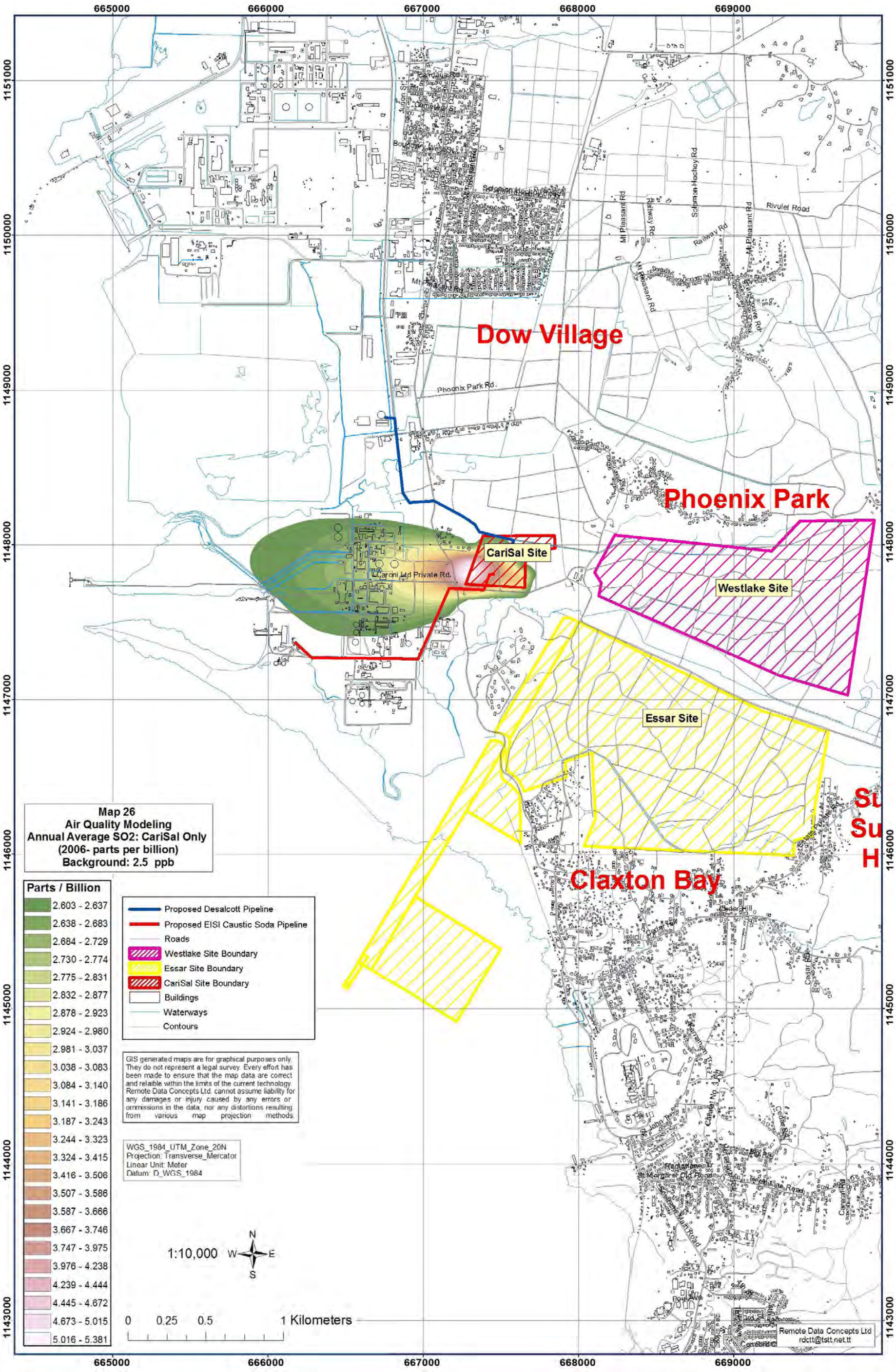

Figure 17. Air Quality Modeling, Annual Average SO_2, CariSal Only.

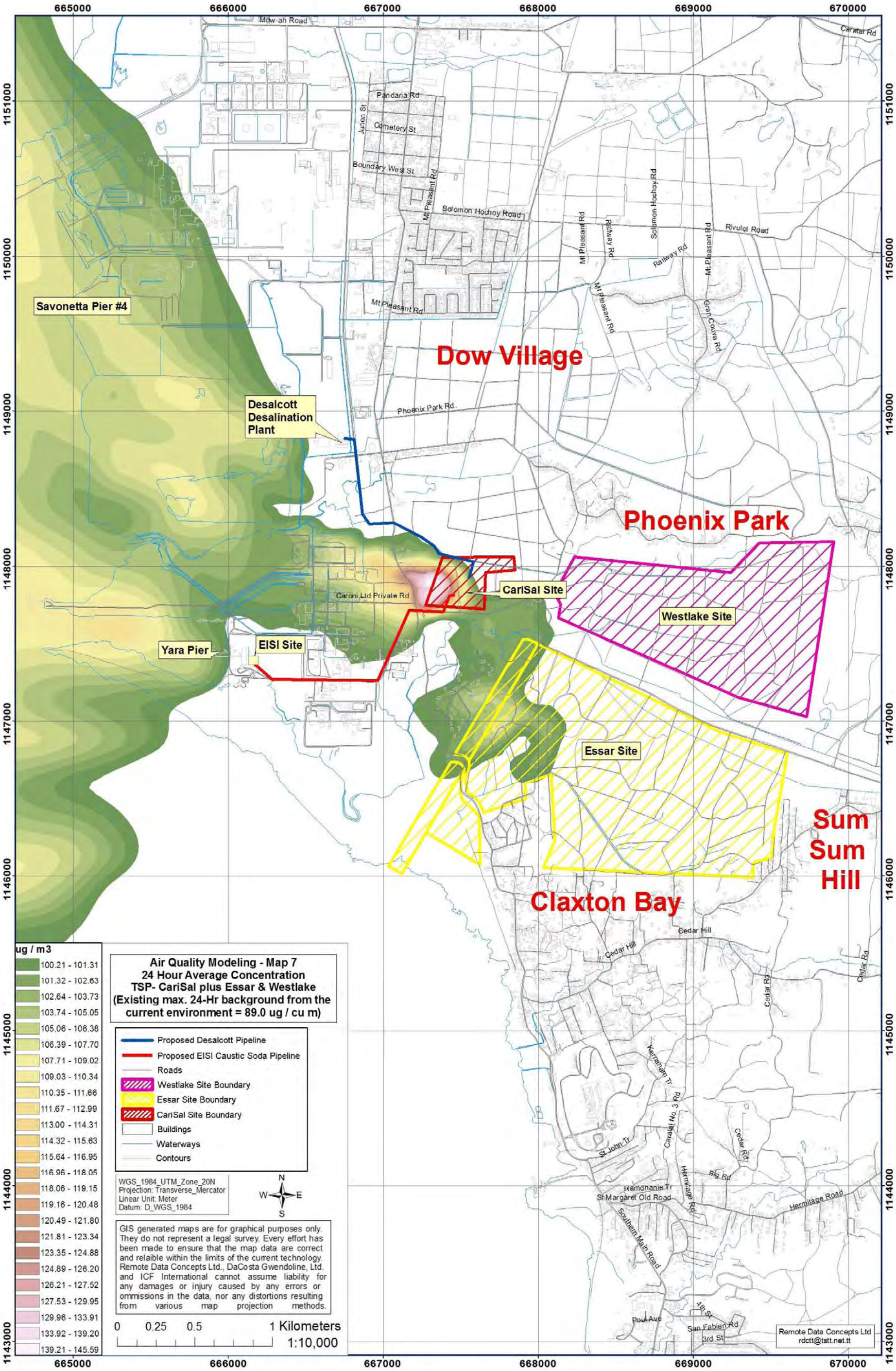

Figure 18. Air Quality Monitoring, 24-Hour Average Concentration TSP, CariSal plus Essar and Westlake

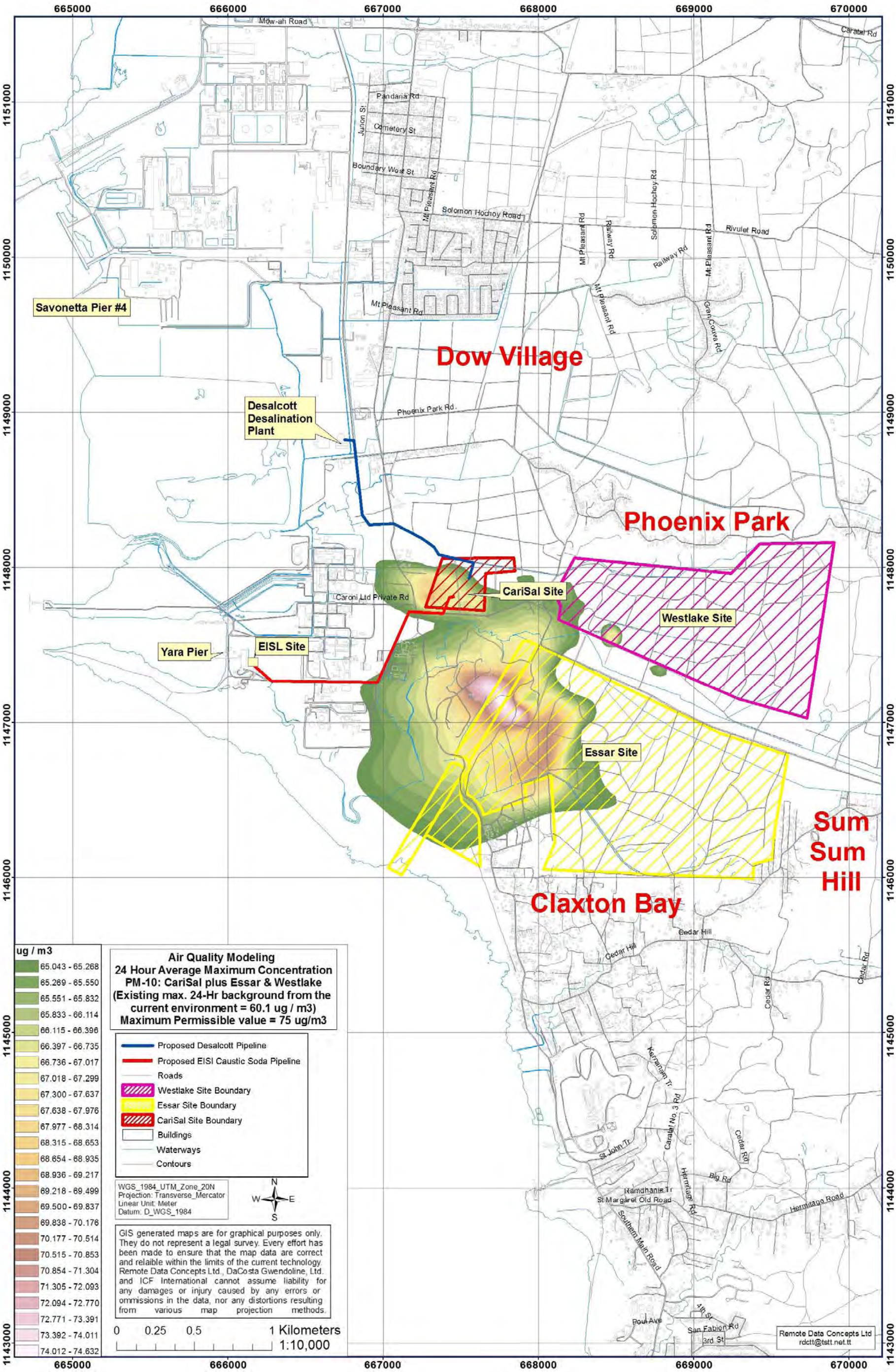

Figure 19. Air Quality Modeling, 24-Hour Average Maximum Concentration PM 10, CariSal plus Essar and Westlake.

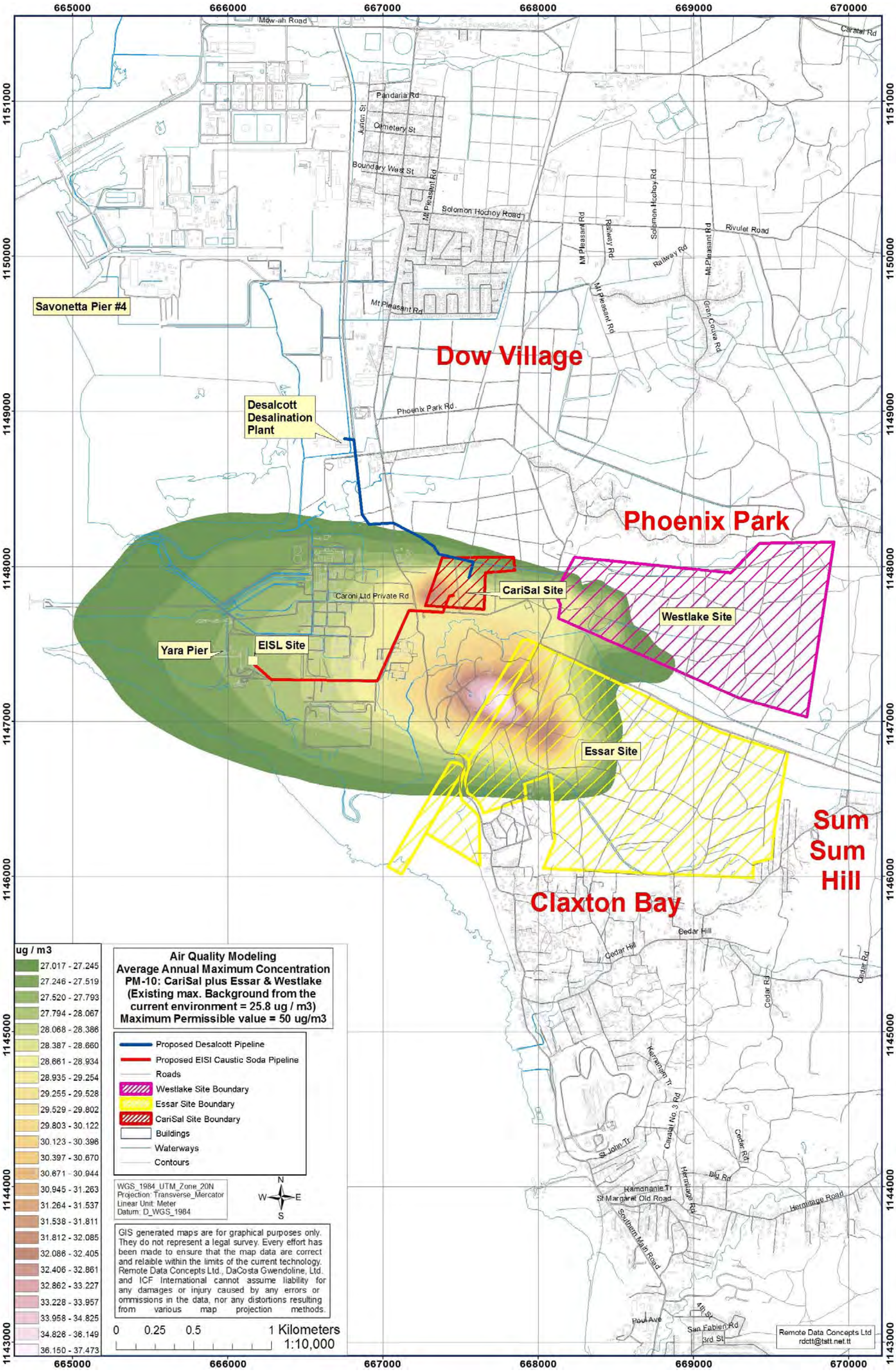

Figure 20. Air Quality Modeling, Average Annual Maximum Concentration PM 10, CariSal plus Essar and Westlake.

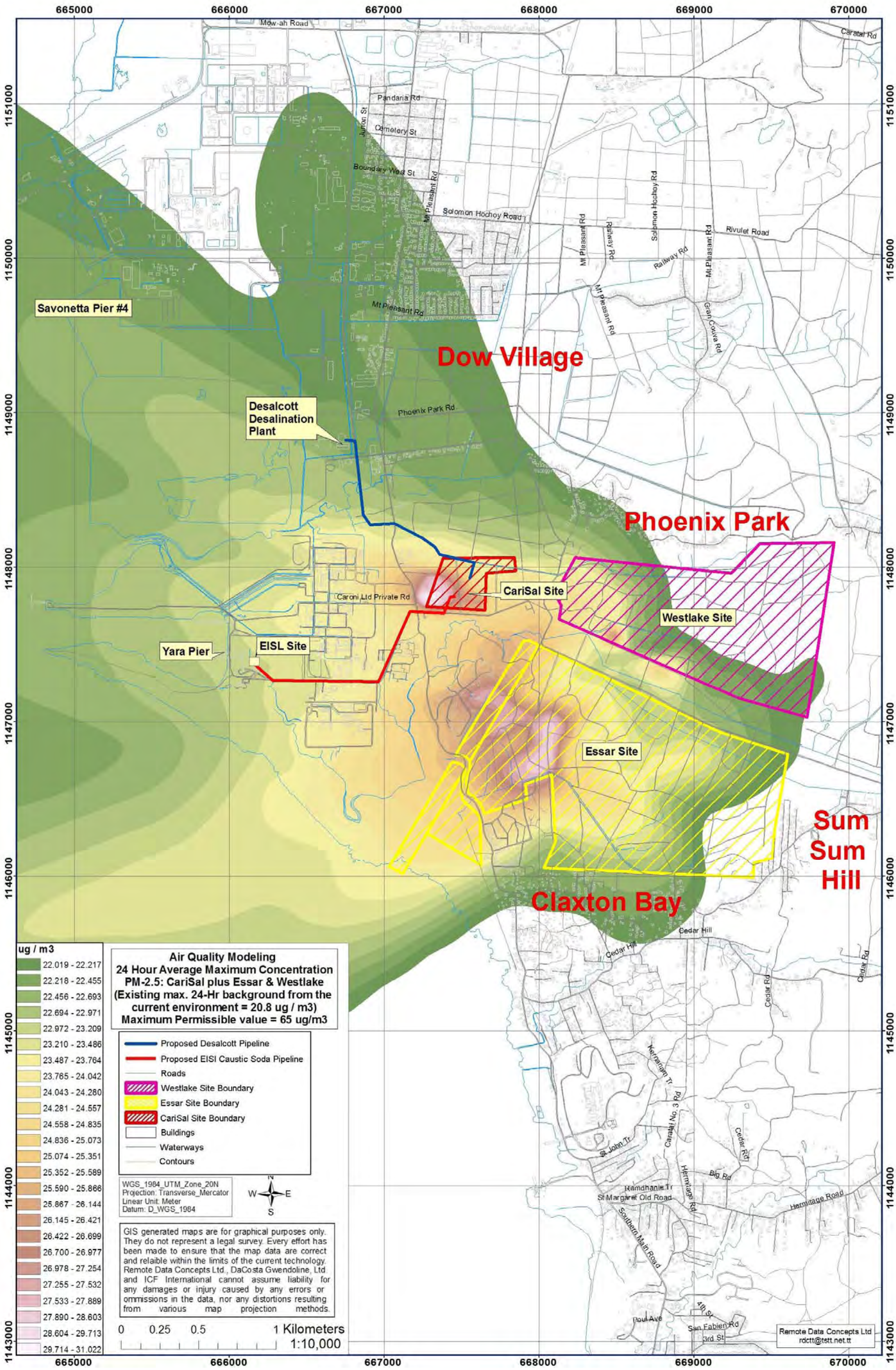

Figure 21. Air Quality Modeling, 24-Hour Average Maximum Concentration PM 2.5, CariSal plus Essar and Westlake.

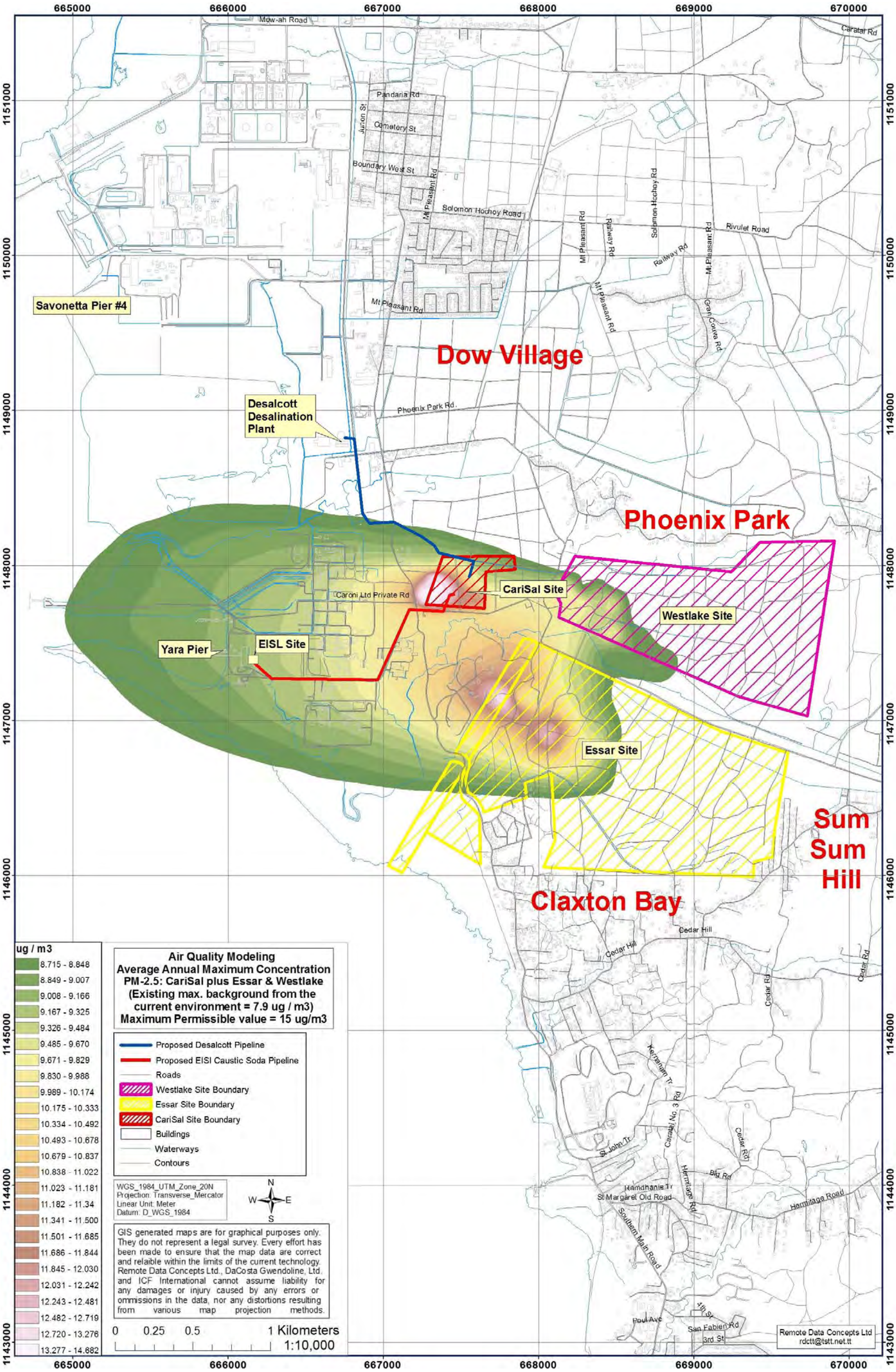

Figure 22. Air Quality Modeling, Average Annual Maximum Concentration PM 2.5, CariSal plus Essar and Westlake.

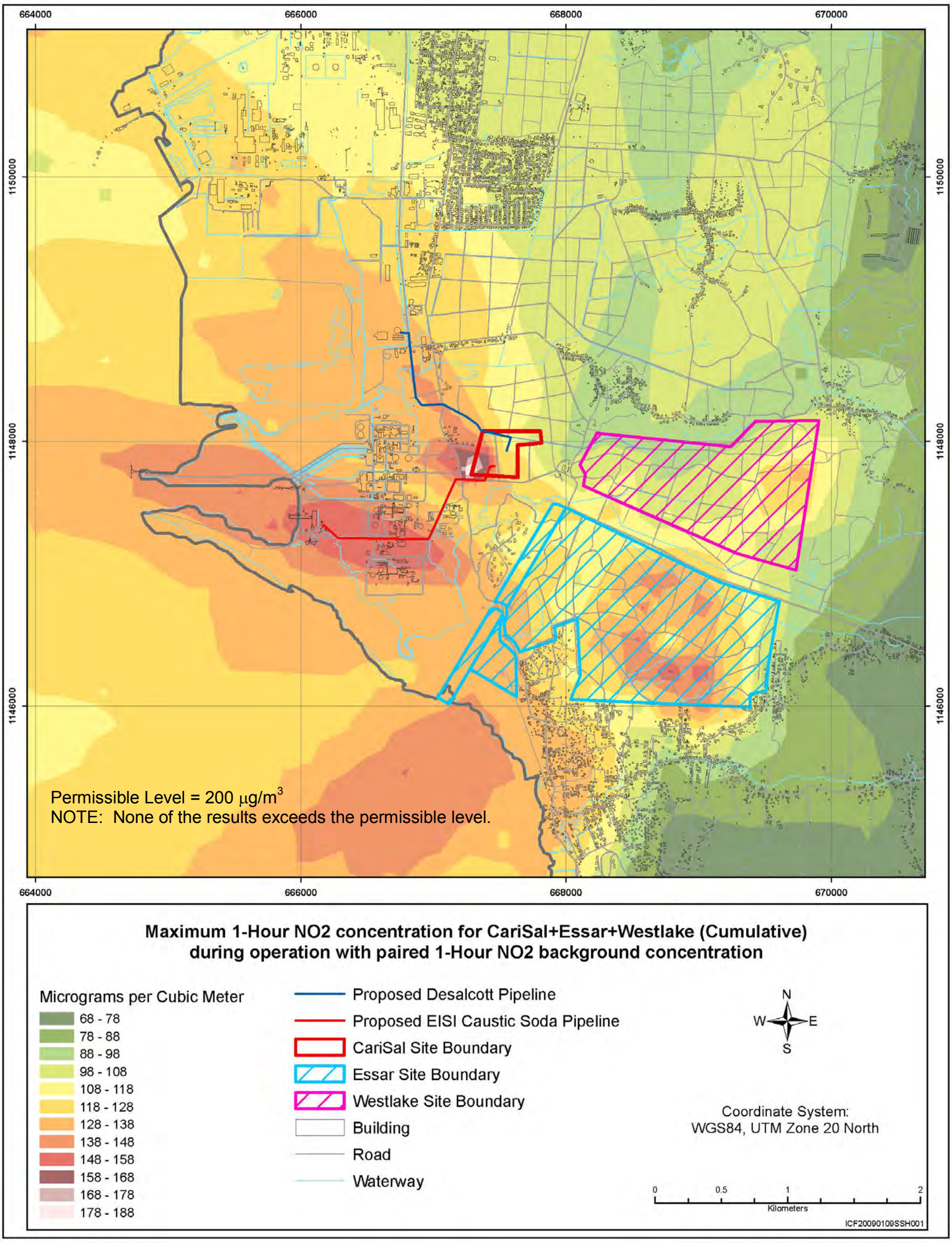

Figure 23. Air Quality Modeling, 1-Hour Average Concentration NO_2, CariSal plus Essar, and Westlake.

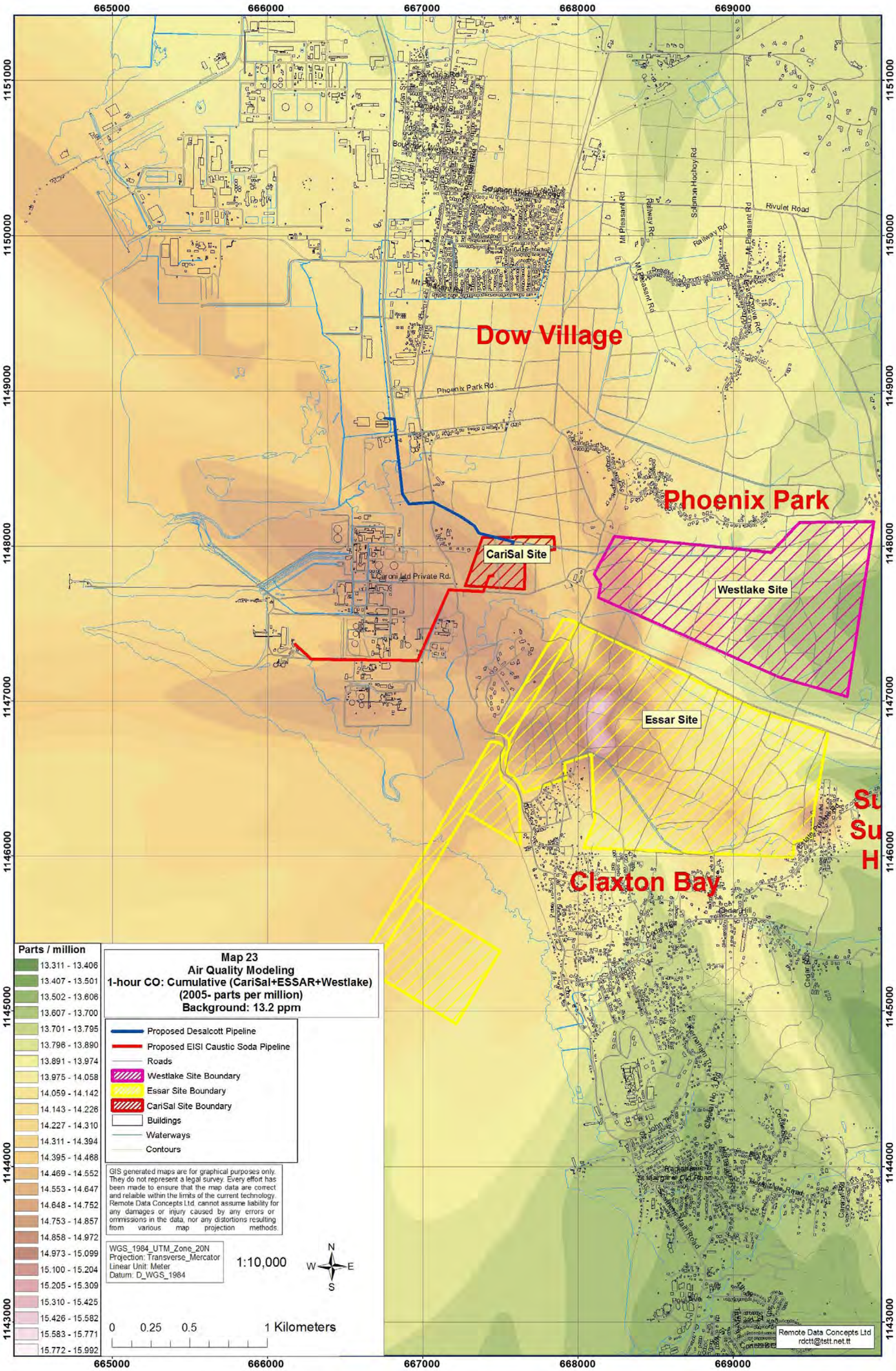

Figure 24. Air Quality Modeling, 1-Hour CO, CariSal plus Essar and Westlake.

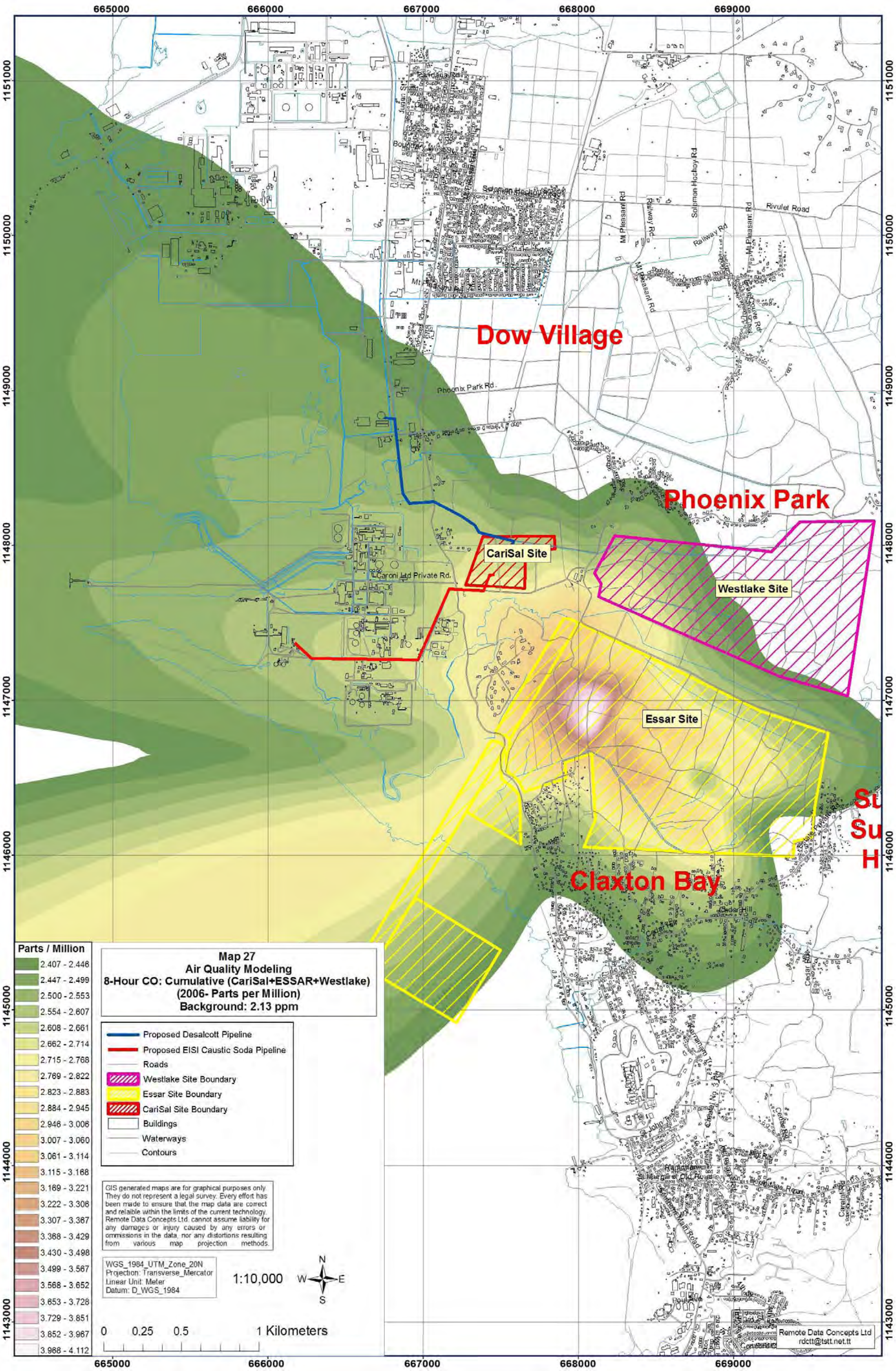

Figure 25. Air Quality Modeling, 8-Hour CO, CariSal plus Essar and Westlake.

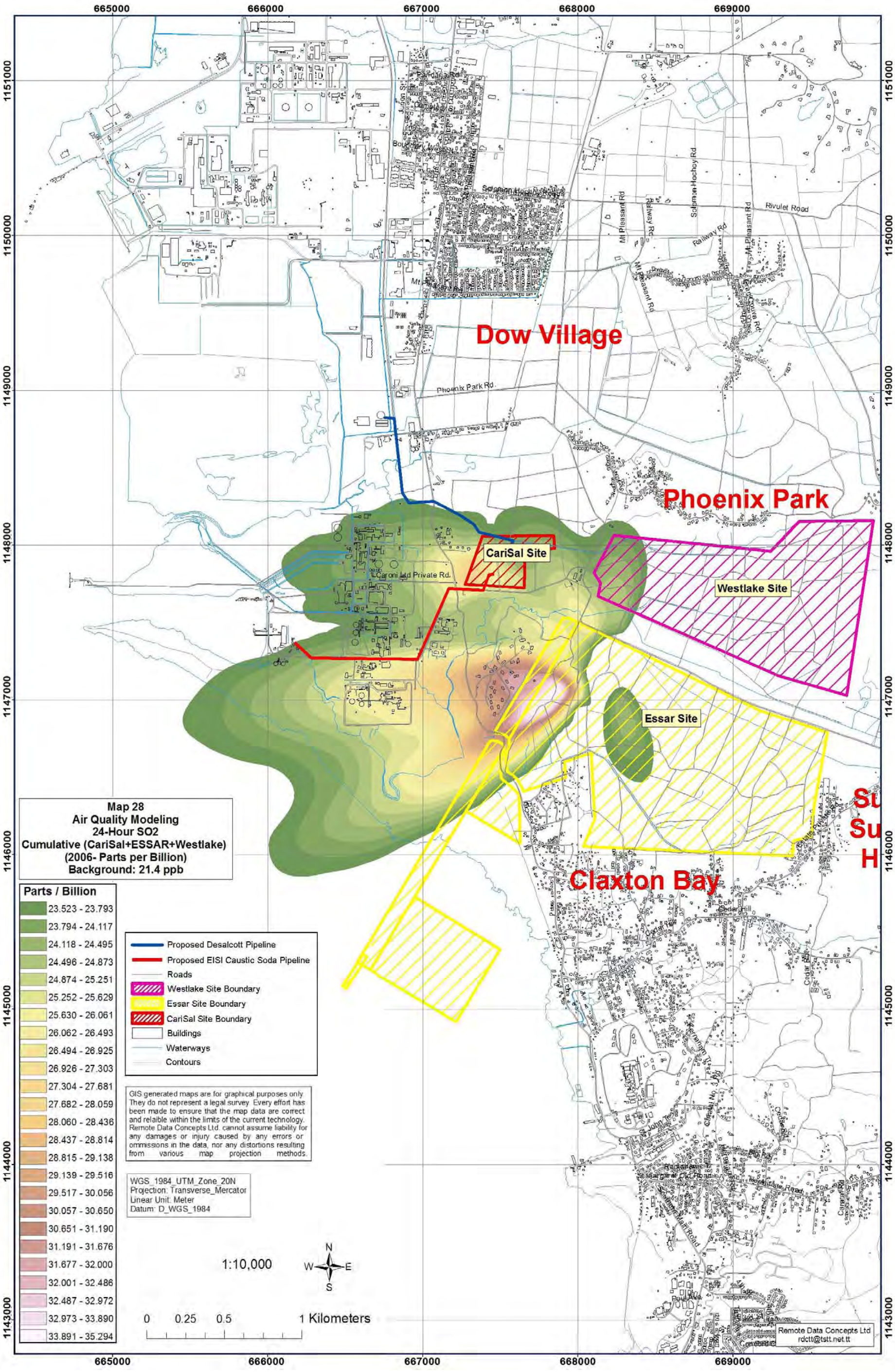

Figure 26. Air Quality Modeling, 24-Hour SO_2, CariSal plus Essar and Westlake.

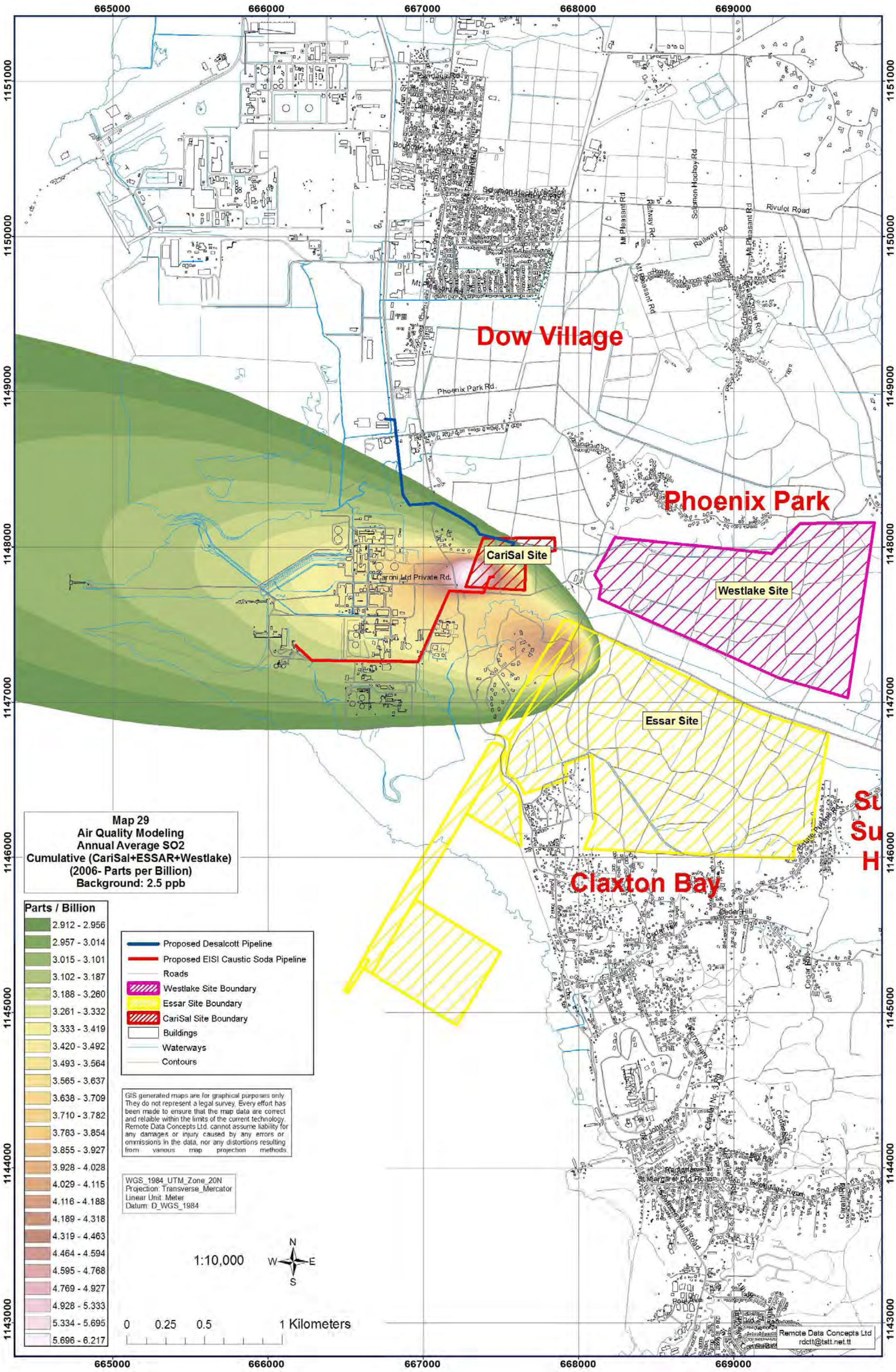

Figure 27. Air Quality Modeling, Annual Average SO_2, CariSal plus Essar and Westlake.

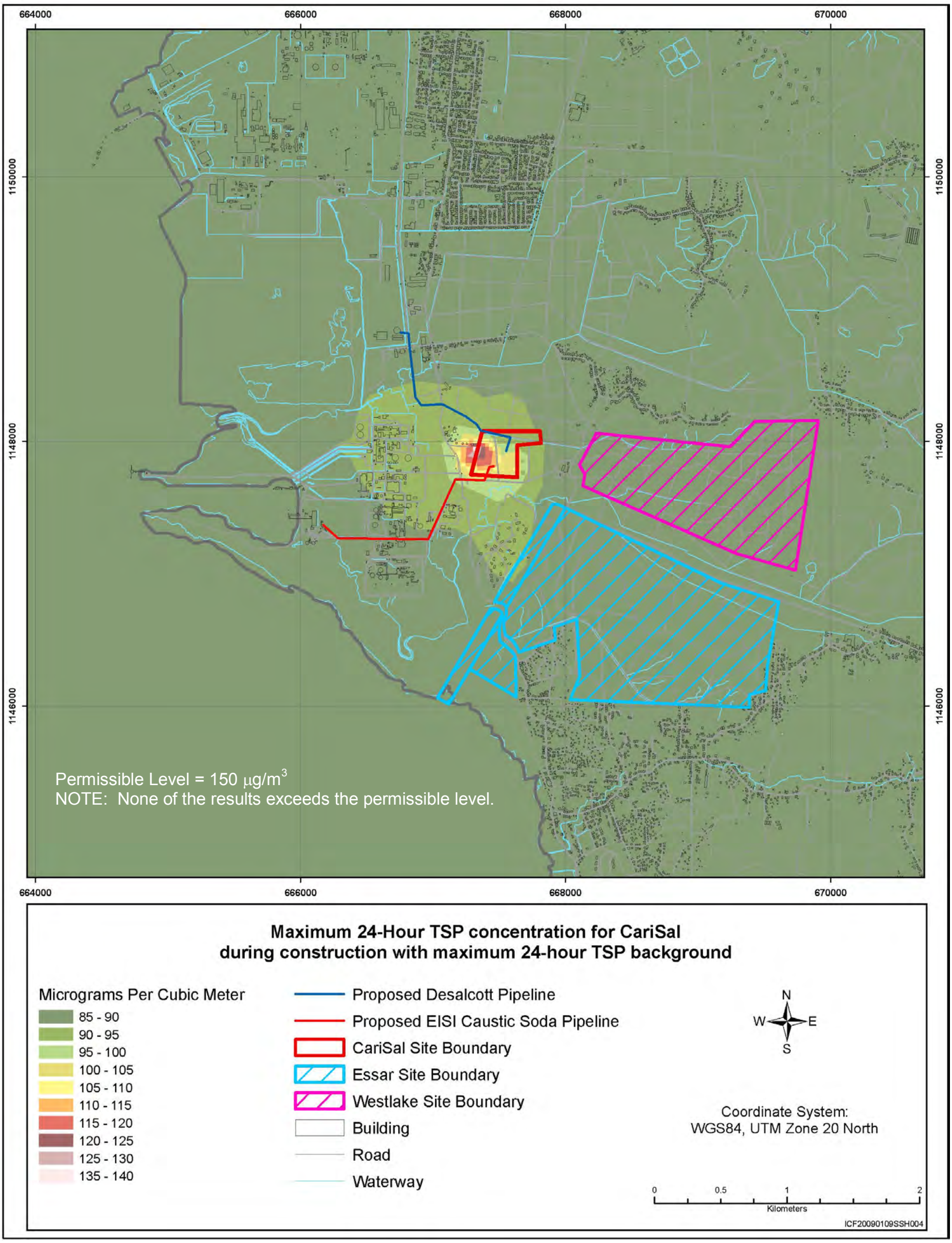

Figure 28. Air Quality Modeling for Total Suspended Particulate, 24-Hour Maximum Concentration, CariSal Only - CONSTRUCTION

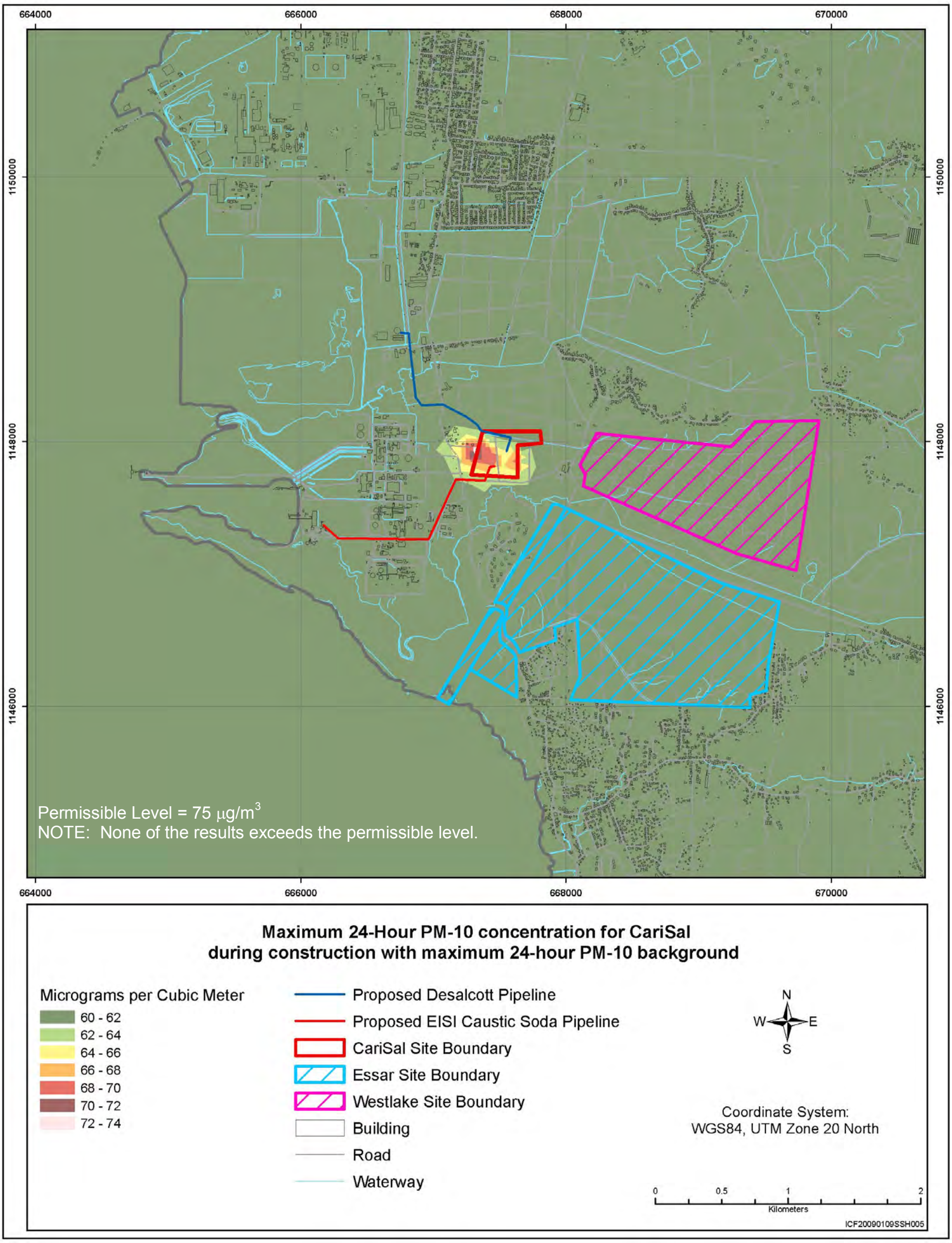

Figure 29. Air Quality Modeling for PM 10. 24-Hour Maximum Concentration, CariSal Only. - CONSTRUCTION

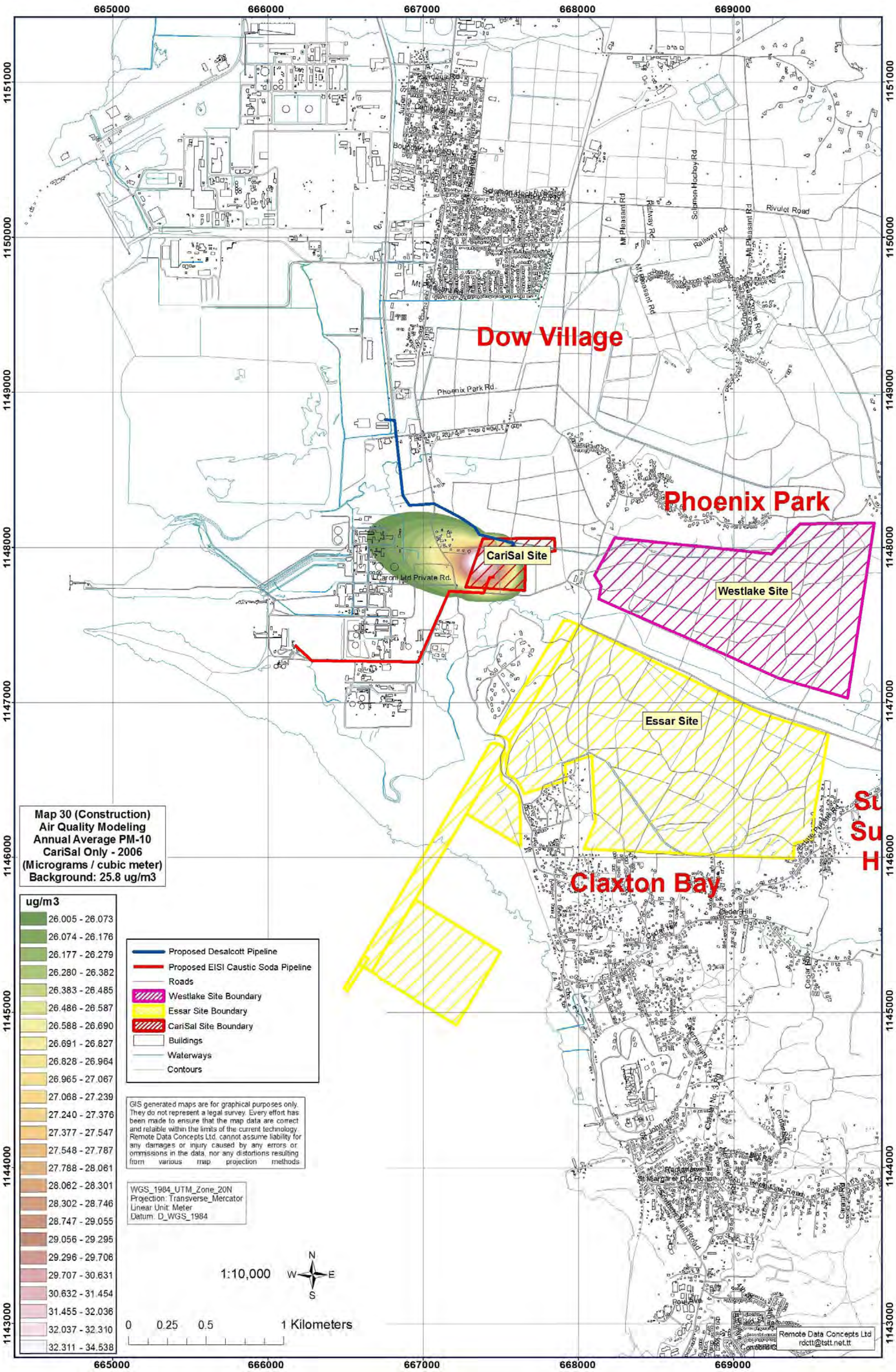

Figure 30. Air Quality Modeling, Annual Average PM 10, CariSal Only. - CONSTRUCTION

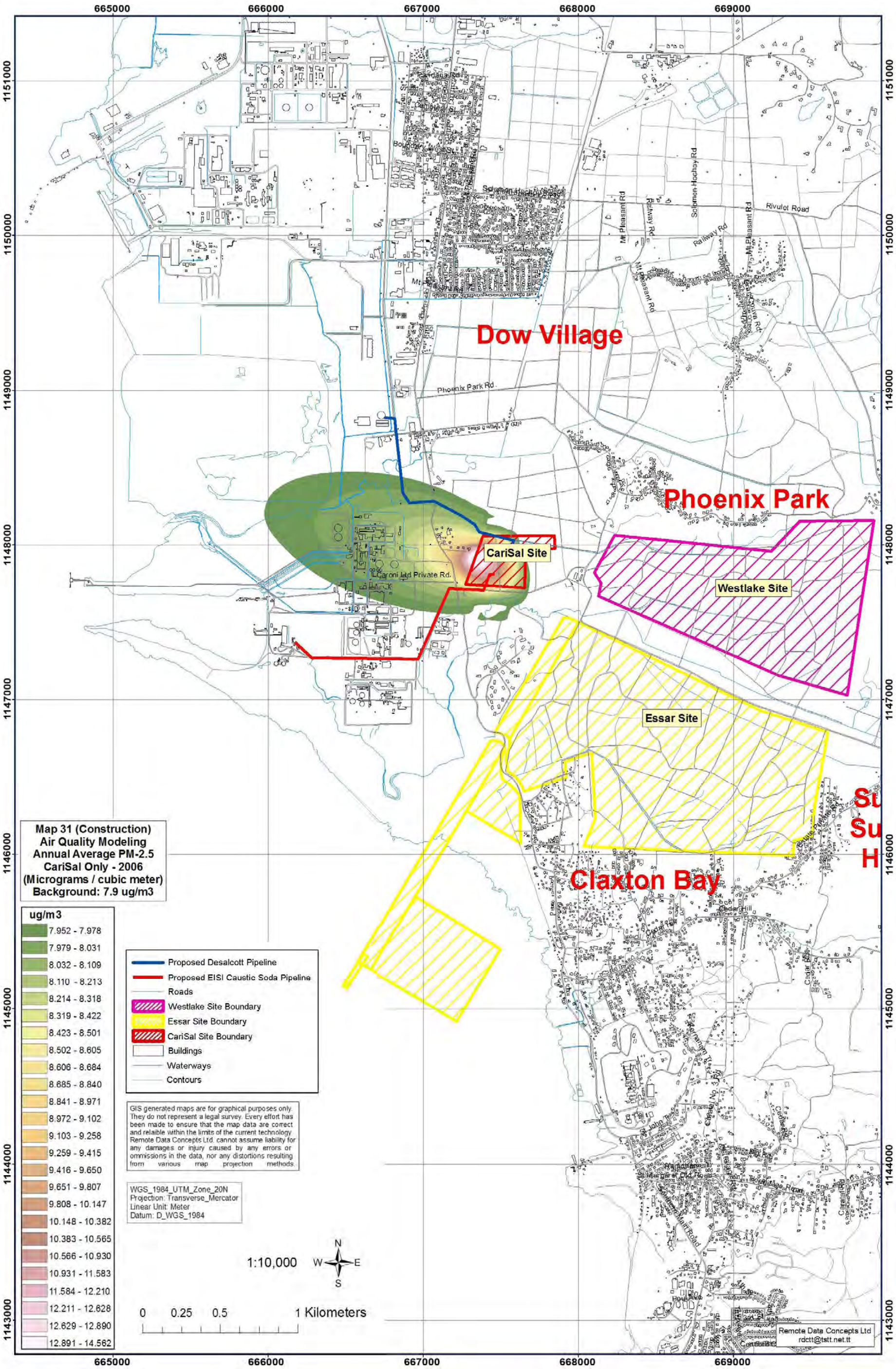

Figure 31. Air Quality Modeling, Annual Average PM 2.5, CariSal Only. - CONSTRUCTION

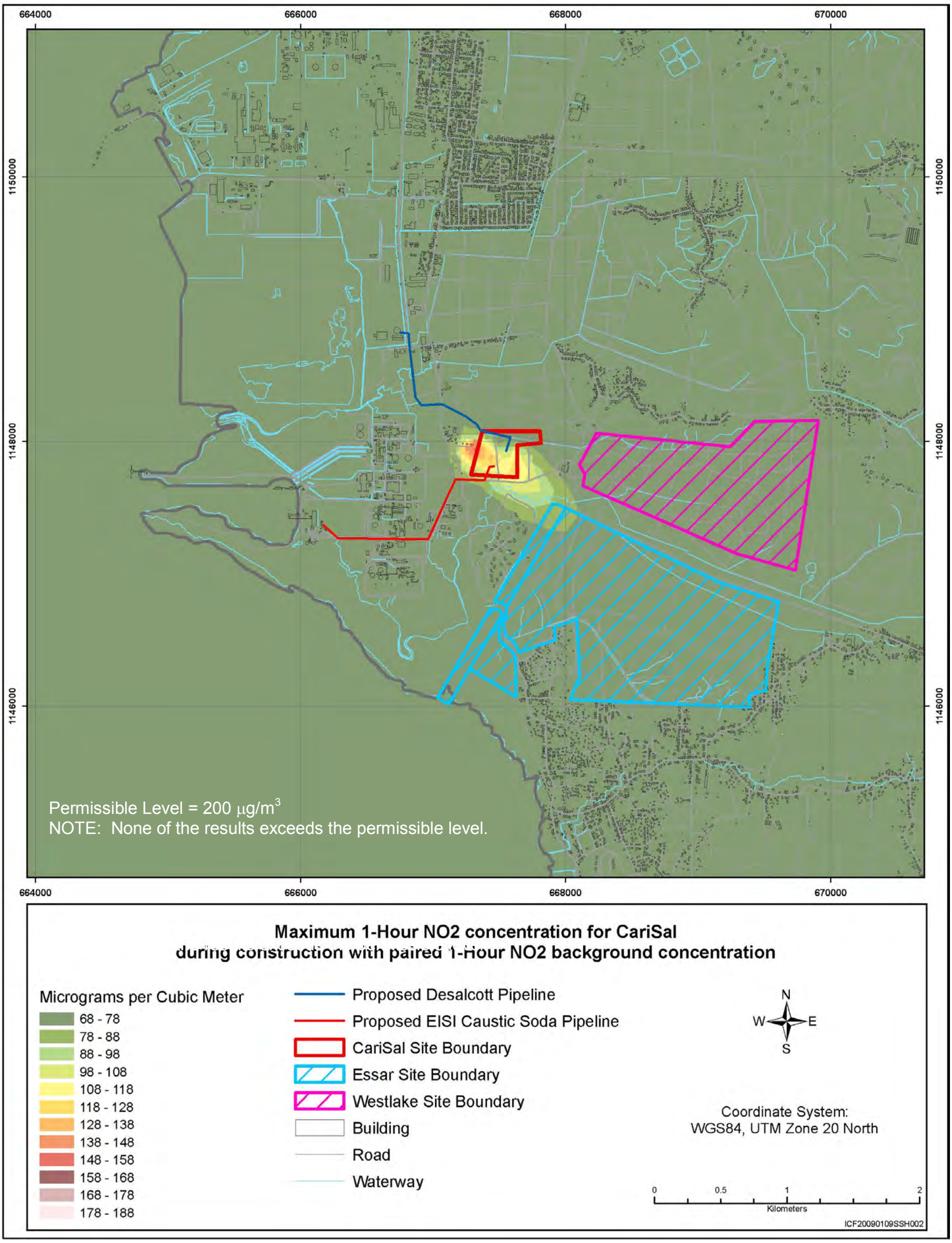

Figure 32. Air Quality Modeling, 1-Hour NO_2, CariSal Only. - CONSTRUCTION

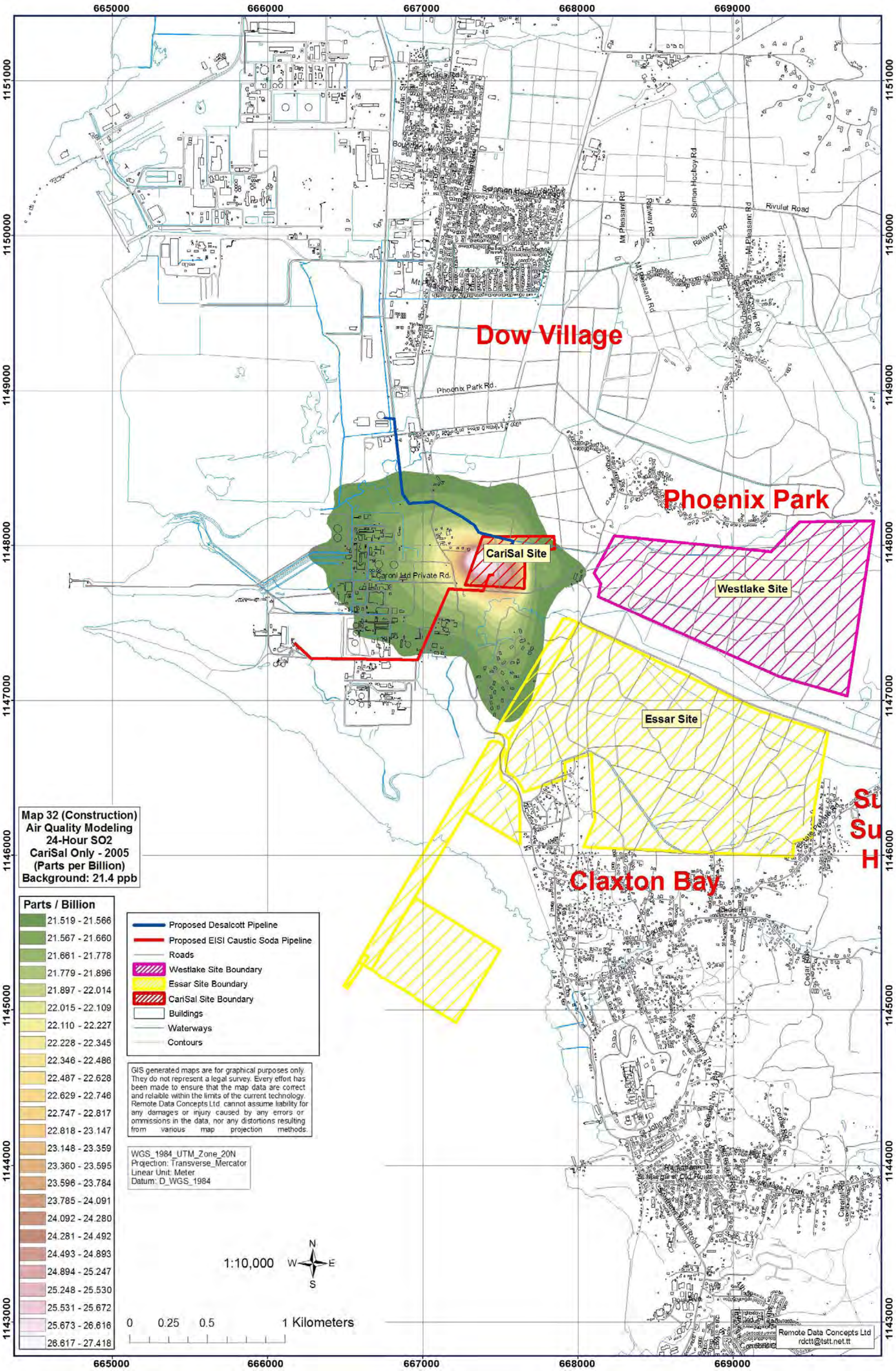

Figure 33. Air Quality Modeling, 24-Hour SO_2, CariSal Only. - CONSTRUCTION

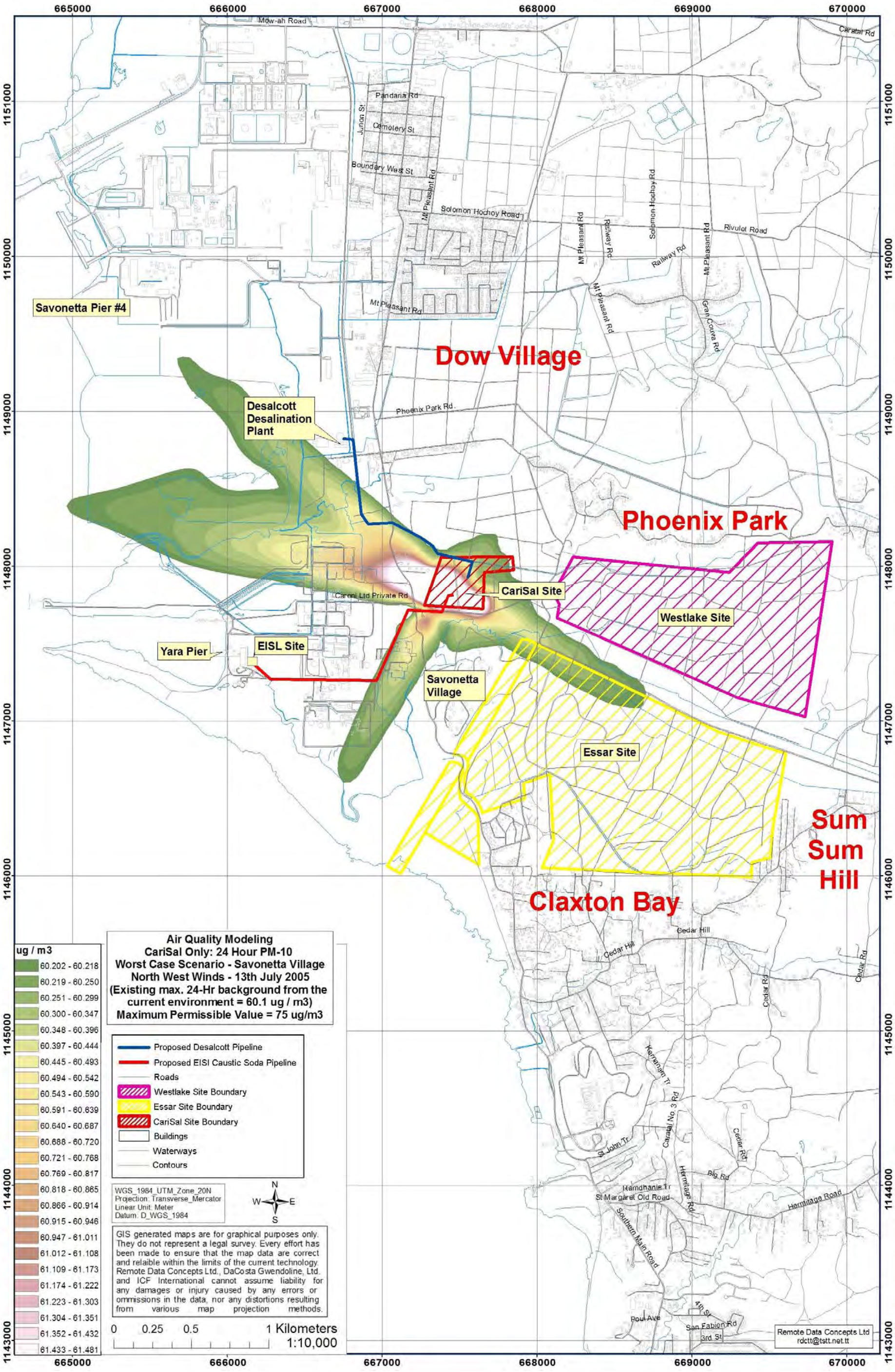

Figure 34. Air Quality Modeling, CariSal Only, 24-Hour PM 10 Worst Case Scenario, Savonetta Village, Northwest Winds, 13, July 2005.

Other

Document
Proposed CariSal Site General Arrangement Figure
Mixing Height Data

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NO	DATE	REVISION	BY	CHK	APP
1	01/05/07	SITE BOUNDARY AND BOUNDARY CO-ORDINATE "A5" MOD.	SH		

GENERAL NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN/STATED.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING WAS COMPILED USING INFORMATION PROVIDED BY CARISAL AND T&TEC THEREFORE SITE BOUNDARY & BOUNDARY CO-ORDINATES ARE TO BE USED FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO CHANGE ON COMPLETION A CADASTRAL SURVEY TO BE CARRIED OUT BY A LICENSED LAND SURVEYOR.
4. T&TEC RESERVE BOUNDARY TO BE ESTABLISHED/VERIFIED ON SITE BY A LICENSED LAND SURVEYOR IN CONJUNCTION WITH THE RELEVANT PERSONNEL FROM T&TEC.
5. PARAMETERS:

GRID -	U.T.M. ZONE 20
PROJECTION -	TRANSVERSE MERCATOR
SPHEROID -	INTERNATIONAL
UNIT OF MEASUREMENT -	METRE
DATUM -	NAPARIMA 1955

LEGEND

PROPOSED CARISAL SITE SHOWN THUS

PROPOSED T&TEC RESERVE SHOWN THUS

EXISTING T&TEC RESERVE SHOWN THUS

EXISTING ESTATE TRACE SHOWN THUS

EXISITNG RAVINE SHOWN THUS

No.	TITLE	DWG. NO.
	REFERENCE DRAWINGS	

CHECKED BY	ENGINEER	APPROVED BY	ACCOUNT NUMBER
DATE	DATE	DATE	JOB NUMBER

NATIONAL ENERGY CORPORATION OF TRINIDAD AND TOBAGO LIMITED

POINT LISAS SOUTH / EAST INDUSTRIAL ESTATE
PROPOSED CARISAL SITE
GENERAL ARRANGEMENT

DATE	23/04/07	DRAWN	SIMON	DRAWING NO.	REV.
SCALE	1:2,500			PTLIS.SE.SK.0005	1

CARISAL BOUNDARY CO-ORDINATES

STATION	NORTHING	EASTING
A1	1 147 751.16	667 285.94
A2	1 147 728.41	667 636.08
A3	1 147 972.14	667 636.62
A4	1 147 968.29	667 814.92
A5	1 148 075.81	667 806.87
A6	1 148 075.81	667 371.11

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yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	1	1	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	39	10	296.5	3	0	0	88	1013	7
5	1	1	1	2	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	42	10	296.6	3	0	0	97	1013	10
5	1	1	1	3	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	62	10	296.9	3	0	0	94	1013	7
5	1	1	1	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.8	3	0	0	100	1013	3
5	1	1	1	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	128	10	296.8	3	0	0	100	1013	3
5	1	1	1	6	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	66	10	296.6	3	0	0	100	1014	0
5	1	1	1	7	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	0.73	1	83	10	297	3	0	0	100	1015	0
5	1	1	1	8	0.1	0.11	-9	-9	-999	84	-1212.4	0.37	0.38	0.33	0.9	106	10	297	3	0	0	97	1016	10
5	1	1	1	9	8.4	0.167	-9	-9	-999	158	-50.5	0.37	0.38	0.22	1.2	108	10	297.5	3	0	0	100	1016	10
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5	1	1	1	14	32.4	0.2	-9	-9	-999	205	-22.2	0.37	0.38	0.19	1.3	120	10	299.9	3	0	0.51	94	1013	10
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5	1	1	1	23	-6.7	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	71	10	297.4	3	0	0	100	1014	7
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5	1	2	2	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	54	10	296.4	3	0	0	94	1013	7
5	1	2	2	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	107	10	296.5	3	0	0	100	1013	7
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5	1	2	2	7	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	0.74	0.7	103	10	297.2	3	0	0	94	1015	0
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5	1	2	2	10	105.6	0.291	1.105	0.005	463	360	-21	0.655	0.64	0.19	1.5	72	10	301.9	3	0	0	82	1016	7
5	1	2	2	11	139.7	0.326	1.518	0.005	907	428	-22.5	0.655	0.64	0.18	1.7	69	10	302.9	3	0	0	77	1015	7
5	1	2	2	12	109.7	0.292	1.506	0.005	1127	363	-20.5	0.655	0.64	0.18	1.5	83	10	303.4	3	0	0	63	1014	8
5	1	2	2	13	91.6	0.273	1.49	0.007	1308	328	-20.1	0.655	0.64	0.18	1.4	82	10	302.9	3	0	0	55	1014	9
5	1	2	2	14	100.5	0.263	1.574	0.007	1402	310	-16.3	0.655	0.64	0.18	1.3	81	10	303.1	3	0	0	48	1013	9
5	1	2	2	15	69.8	0.279	1.404	0.007	1433	339	-28.1	0.655	0.64	0.18	1.5	43	10	303.8	3	0	0	49	1012	9
5	1	2	2	16	52.1	0.297	1.28	0.007	1454	372	-45.4	0.655	0.64	0.2	1.7	36	10	303.4	3	0	0	52	1012	9
5	1	2	2	17	4.7	0.231	0.573	0.007	1453	257	-239.4	0.655	0.64	0.27	1.5	31	10	300.9	3	0	0	57	1013	10
5	1	2	2	18	-1.9	0.059	-9	-9	-999	76	9.6	0.655	0.64	0.54	0.8	52	10	298.9	3	0	0	63	1013	3
5	1	2	2	19	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	83	10	297.9	3	0	0	79	1014	3
5	1	2	2	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	72	10	297.2	3	0	0	79	1014	0
5	1	2	2	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	84	10	297.1	3	0	0	74	1015	3
5	1	2	2	22	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	76	10	296.9	3	0	0	79	1014	3
5	1	2	2	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	78	10	296.6	3	0	0	85	1014	0
5	1	2	2	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296	3	0	0	84	1014	3
5	1	3	3	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	95	10	295.6	3	0	0	84	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	3	3	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	295.4	3	0	0	93	1012	0
5	1	3	3	3	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	54	10	295.2	3	0	0	97	1012	3
5	1	3	3	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	53	10	294.9	3	0	0	97	1012	3
5	1	3	3	5	-1	0.037	-9	-9	-999	16	4.5	0.655	0.64	1	0.5	73	10	294.9	3	0	0	82	1013	0
5	1	3	3	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	295	3	0	0	93	1013	3
5	1	3	3	7	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	0.74	0.8	78	10	298.6	3	0	0	97	1014	0
5	1	3	3	8	52	0.245	0.683	0.005	222	279	-25.6	0.655	0.64	0.32	1.3	66	10	300.9	3	0	0	79	1015	0
5	1	3	3	9	83.5	0.27	0.947	0.005	368	324	-21.4	0.655	0.64	0.22	1.4	77	10	302.5	3	0	0	72	1015	0
5	1	3	3	10	120.5	0.282	1.298	0.005	658	344	-16.8	0.655	0.64	0.19	1.4	82	10	303.4	3	0	0	63	1015	6
5	1	3	3	11	98.8	0.221	1.417	0.006	1044	240	-9.9	0.655	0.64	0.18	1	76	10	303.6	3	0	0	50	1014	8
5	1	3	3	12	117.1	0.165	1.531	0.006	1109	154	-3.5	0.655	0.64	0.18	0.6	8	10	303.6	3	0	0	53	1014	8
5	1	3	3	13	73.5	0.2	1.327	0.006	1149	205	-9.8	0.655	0.64	0.18	0.9	344	10	302.9	3	0	0	56	1012	9
5	1	3	3	14	39.3	-9	-9	-9	1170	-999	-99999	0.542	0.56	0.17	0	0	10	302	3	0	0	59	1012	10
5	1	3	3	15	20.6	-9	-9	-9	1181	-999	-99999	0.542	0.56	0.17	0	0	10	301.8	3	0	0	65	1012	10
5	1	3	3	16	13.5	0.163	0.763	0.005	1188	151	-28.9	0.37	0.38	0.21	1.1	117	10	301	3	0	0	71	1012	10
5	1	3	3	17	0.1	0.146	0.149	0.005	1186	129	-2818.9	0.37	0.38	0.28	1.2	97	10	299.9	3	0	0	77	1012	10
5	1	3	3	18	-1.9	0.067	-9	-9	-999	42	13.9	0.37	0.38	0.54	1.1	110	10	299	3	0	0	81	1013	7
5	1	3	3	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	100	10	298.4	3	0	0	85	1013	99
5	1	3	3	20	-5	0.085	-9	-9	-999	57	11	0.37	0.38	1	1.4	104	10	297.4	3	0	0	90	1014	7
5	1	3	3	21	-4.3	0.079	-9	-9	-999	51	10.2	0.37	0.38	1	1.3	88	10	296.2	3	0	0.51	92	1015	7
5	1	3	3	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	53	10	296.1	3	0	1.02	94	1014	99
5	1	3	3	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	296.4	3	0	0	97	1014	7
5	1	3	3	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	296.4	3	0	0.25	97	1013	7
5	1	4	4	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	81	10	296.2	3	0	0.25	97	1012	99
5	1	4	4	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	83	10	296.2	3	0	0.25	97	1012	7
5	1	4	4	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	60	10	296.1	3	0	0	100	1012	7
5	1	4	4	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	43	10	296.2	3	0	0	100	1012	7
5	1	4	4	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	46	10	296.1	3	0	0	94	1012	7
5	1	4	4	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	296.2	3	0	0	94	1013	7
5	1	4	4	7	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	0.74	0.8	85	10	299.2	3	0	0	94	1013	0
5	1	4	4	8	47.2	0.243	0.674	0.005	234	275	-27.4	0.655	0.64	0.33	1.3	73	10	300.5	3	0	0	88	1014	0
5	1	4	4	9	75.5	0.24	0.949	0.005	409	270	-16.5	0.37	0.38	0.23	1.5	95	10	301.9	3	0	0	82	1015	0
5	1	4	4	10	79.7	0.263	1.094	0.005	595	311	-20.7	0.37	0.38	0.2	1.7	110	10	302.5	3	0	0	77	1015	6
5	1	4	4	11	112	0.261	1.359	0.005	811	307	-14.4	0.37	0.38	0.19	1.6	92	10	302.9	3	0	0	72	1014	5
5	1	4	4	12	51	-9	-9	-9	847	-999	-99999	0.542	0.56	0.17	0	0	10	302	3	0	2.29	79	1013	10
5	1	4	4	13	5.8	0.33	0.514	0.005	848	436	-564.2	0.655	0.64	0.18	2.2	343	10	297.4	3	0	65.53	86	1012	10
5	1	4	4	14	7.3	0.249	0.556	0.005	852	288	-191.6	0.655	0.64	0.18	1.6	4	10	296.9	3	0	10.92	94	1012	10
5	1	4	4	15	3.5	0.201	0.434	0.005	854	208	-213.4	0.655	0.64	0.18	1.3	45	10	296.4	3	0	24.38	999	1012	10
5	1	4	4	16	4.9	-9	-9	-9	858	-999	-99999	0.542	0.56	0.19	0	0	10	296.9	3	0	3.3	999	1012	10
5	1	4	4	17	0.1	0.147	0.134	0.005	858	130	-2892.7	0.655	0.64	0.27	1	5	10	297	3	0	0.51	999	1012	10
5	1	4	4	18	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	0.53	1	17	10	296.9	3	0	0.25	999	1013	99
5	1	4	4	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	24	10	296.9	3	0	0	999	1013	99
5	1	4	4	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	64	10	296.6	3	0	0	97	1014	7
5	1	4	4	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	52	10	296.5	3	0	0	97	1015	7
5	1	4	4	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	68	10	296.4	3	0	3.81	97	1015	99
5	1	4	4	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	35	10	296.4	3	0	0	97	1014	7
5	1	4	4	24	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	71	10	296.4	3	0	0	90	1014	3
5	1	5	5	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	34	10	296	3	0	0	90	1013	7
5	1	5	5	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	63	10	295.9	3	0	0	85	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	5	5	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	42	10	295.9	3	0	0	90	1012	7
5	1	5	5	4	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	50	10	295.9	3	0	0	91	1013	7
5	1	5	5	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	62	10	295.9	3	0	0	93	1013	7
5	1	5	5	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	49	10	296.1	3	0	0	88	1013	7
5	1	5	5	7	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	0.75	0.7	114	10	296.5	3	0	0	83	1014	0
5	1	5	5	8	14.2	0.142	0.365	0.005	124	123	-18.2	0.37	0.38	0.33	0.9	116	10	297.9	3	0	0	79	1015	7
5	1	5	5	9	50.9	0.113	0.671	0.005	215	88	-2.6	0.37	0.38	0.23	0.5	88	10	300.5	3	0	0	999	1015	7
5	1	5	5	10	103.9	0.25	1.049	0.005	402	287	-13.6	0.655	0.64	0.19	1.2	66	10	302.1	3	0	0.25	999	1015	7
5	1	5	5	11	114.2	0.306	1.243	0.005	608	390	-22.8	0.655	0.64	0.18	1.6	69	10	302.4	3	0	0	999	1015	8
5	1	5	5	12	138.4	0.3	1.464	0.005	821	377	-17.6	0.655	0.64	0.18	1.5	80	10	303	3	0	0	999	1014	8
5	1	5	5	13	133.5	0.244	1.509	0.005	932	278	-9.8	0.655	0.64	0.18	1.1	72	10	303.8	3	0	0	999	1013	8
5	1	5	5	14	115.1	0.24	1.484	0.005	1026	270	-10.8	0.655	0.64	0.18	1.1	14	10	303.5	3	0	0	50	1012	8
5	1	5	5	15	99.6	0.329	1.451	0.005	1106	433	-32.1	0.655	0.64	0.18	1.8	351	10	302.8	3	0	0	999	1011	8
5	1	5	5	16	30.7	0.233	0.987	0.005	1130	262	-37	0.655	0.64	0.2	1.3	53	10	302.2	3	0	0	999	1011	10
5	1	5	5	17	1.1	0.167	0.326	0.005	1127	158	-377.5	0.655	0.64	0.27	1.1	39	10	300.2	3	0	0	999	1011	10
5	1	5	5	18	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	0.52	0.8	43	10	298.4	3	0	0	999	1012	99
5	1	5	5	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	52	10	297.8	3	0	0	999	1013	99
5	1	5	5	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	297.5	3	0	0	88	1013	3
5	1	5	5	21	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	97	10	297.1	3	0	0	88	1013	3
5	1	5	5	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	103	10	296.8	3	0	0	89	1013	99
5	1	5	5	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	88	10	297.4	3	0	0	90	1013	7
5	1	5	5	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	297.1	3	0	0	89	1012	7
5	1	6	6	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	70	10	296.8	3	0	0	88	1011	99
5	1	6	6	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.5	3	0	0	87	1011	7
5	1	6	6	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	66	10	296.5	3	0	0	999	1011	7
5	1	6	6	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	83	10	296.8	3	0	0	999	1011	99
5	1	6	6	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	52	10	296.5	3	0	0	999	1011	99
5	1	6	6	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	59	10	296.4	3	0	0	999	1012	99
5	1	6	6	7	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	0.75	0.8	80	10	298.4	3	0	0	999	1012	0
5	1	6	6	8	35.1	0.223	0.527	0.005	150	242	-28.5	0.655	0.64	0.33	1.2	80	10	300.4	3	0	0	82	1014	0
5	1	6	6	9	77.3	0.36	0.854	0.005	291	497	-54.5	0.655	0.64	0.22	2.1	81	10	302	3	0	0	999	1014	6
5	1	6	6	10	80	0.296	0.989	0.005	438	372	-29.2	0.37	0.38	0.2	2	90	10	303	3	0	0	999	1014	7
5	1	6	6	11	73.4	0.294	1.051	0.005	572	366	-31.2	0.37	0.38	0.19	2	107	10	303	3	0	0	999	1013	8
5	1	6	6	12	68.8	0.281	1.148	0.005	793	343	-29.1	0.37	0.38	0.19	1.9	112	10	303.4	3	0	0	999	1012	9
5	1	6	6	13	54.8	0.265	1.088	0.005	847	314	-30.6	0.37	0.38	0.19	1.8	109	10	302.9	3	0	0	999	1012	9
5	1	6	6	14	59.9	0.245	1.146	0.005	907	280	-22.2	0.37	0.38	0.19	1.6	103	10	303.2	3	0	0	68	1011	9
5	1	6	6	15	46.9	0.283	1.075	0.005	954	347	-43.6	0.37	0.38	0.19	2	96	10	302.9	3	0	0	999	1010	9
5	1	6	6	16	22.4	0.236	0.846	0.005	974	265	-53	0.37	0.38	0.21	1.7	92	10	301.9	3	0	0	999	1010	10
5	1	6	6	17	0.9	0.173	0.289	0.005	973	167	-525.6	0.37	0.38	0.28	1.4	90	10	300.6	3	0	0.76	999	1010	10
5	1	6	6	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.53	1.4	93	10	298.9	3	0	0	999	1011	99
5	1	6	6	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.8	82	10	298.4	3	0	0	999	1012	99
5	1	6	6	20	-11.4	0.213	-9	-9	-999	226	76.5	0.655	0.64	1	1.8	71	10	297.5	3	0	0.25	97	1013	10
5	1	6	6	21	-2.8	0.073	-9	-9	-999	63	12.9	0.655	0.64	1	1	67	10	297.4	3	0	0	999	1013	10
5	1	6	6	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	81	10	297.4	3	0	0	999	1013	99
5	1	6	6	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.4	81	10	297.6	3	0	0	999	1012	99
5	1	6	6	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.2	90	10	297.5	3	0	0	999	1012	99
5	1	7	7	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.2	86	10	297.5	3	0	0	999	1012	99
5	1	7	7	2	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	98	10	297.4	3	0	0	999	1011	99
5	1	7	7	3	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	80	10	297.4	3	0	0	999	1010	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	7	7	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	89	10	297.4	3	0	0.25	999	1011	99
5	1	7	7	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.4	106	10	297.2	3	0	9.14	999	1012	99
5	1	7	7	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.3	103	10	296.5	3	0	4.32	999	1013	99
5	1	7	7	7	-10	0.117	-9	-9	-999	93	14.6	0.655	0.64	0.76	1.6	78	10	296.5	3	0	2.03	999	1014	0
5	1	7	7	8	16.5	0.221	0.38	0.005	119	239	-59	0.655	0.64	0.33	1.3	62	10	297.1	3	0	0.25	999	1014	9
5	1	7	7	9	25.2	0.271	0.485	0.005	164	324	-71.3	0.37	0.38	0.23	2	86	10	298	3	0	0.25	999	1015	9
5	1	7	7	10	26.4	0.304	0.536	0.005	211	386	-96.9	0.37	0.38	0.2	2.3	116	10	297.9	3	0	0.51	999	1015	10
5	1	7	7	11	46.8	0.272	0.725	0.005	294	327	-39	0.37	0.38	0.19	1.9	110	10	298.5	3	0	0	999	1014	9
5	1	7	7	12	44.9	0.249	0.775	0.005	375	287	-31.3	0.37	0.38	0.19	1.7	110	10	299.5	3	0	0	999	1013	10
5	1	7	7	13	42.4	0.248	0.809	0.005	451	285	-32.6	0.37	0.38	0.19	1.7	126	10	299.8	3	0	0	999	1012	10
5	1	7	7	14	46.3	0.261	0.882	0.005	535	307	-34.7	0.37	0.38	0.19	1.8	134	10	300.4	3	0	0	85	1012	9
5	1	7	7	15	24.7	0.227	0.734	0.005	578	249	-42.8	0.37	0.38	0.19	1.6	125	10	299.9	3	0	0	999	1012	10
5	1	7	7	16	17.9	0.178	0.671	0.005	609	173	-28.5	0.37	0.38	0.21	1.2	90	10	299.5	3	0	0	999	1012	10
5	1	7	7	17	0.2	0.123	0.157	0.005	608	100	-743.1	0.37	0.38	0.27	1	114	10	298.8	3	0	0	999	1013	10
5	1	7	7	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.52	1.1	120	10	298.4	3	0	0	999	1013	99
5	1	7	7	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.2	117	10	298.4	3	0	0.25	999	1013	99
5	1	7	7	20	-3.5	0.079	-9	-9	-999	51	12.6	0.37	0.38	1	1.3	112	10	297.5	3	0	0.25	94	1014	10
5	1	7	7	21	-2.2	0.066	-9	-9	-999	39	11.6	0.655	0.64	1	0.9	74	10	297.2	3	0	0	999	1015	10
5	1	7	7	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	73	10	297	3	0	0	999	1015	99
5	1	7	7	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	85	10	297.1	3	0	0.25	999	1015	99
5	1	7	7	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.2	122	10	297.5	3	0	0	999	1014	99
5	1	8	8	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.4	126	10	297.5	3	0	0	999	1014	99
5	1	8	8	2	-6.1	0.1	-9	-9	-999	72	14.6	0.736	0.77	1	1.3	144	10	297.2	3	0	0.25	94	1013	7
5	1	8	8	3	-8.2	0.115	-9	-9	-999	90	16.8	0.736	0.77	1	1.5	144	10	297.1	3	0	0	90	1012	7
5	1	8	8	4	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	128	10	297.1	3	0	0	999	1012	7
5	1	8	8	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	110	10	297	3	0	0	999	1013	99
5	1	8	8	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	117	10	297.1	3	0	0.51	999	1014	99
5	1	8	8	7	-5.8	0.085	-9	-9	-999	57	9.6	0.37	0.38	0.77	1.4	124	10	297.4	3	0	0	999	1014	0
5	1	8	8	8	26.1	0.292	0.483	0.005	156	363	-86.4	0.736	0.77	0.33	1.7	158	10	297.9	3	0	0	94	1015	7
5	1	8	8	9	65.7	0.218	0.812	0.005	294	236	-14.3	0.736	0.77	0.22	1	148	10	299.4	3	0	0	999	1015	8
5	1	8	8	10	71.3	0.184	0.958	0.005	447	182	-7.9	0.655	0.64	0.19	0.8	24	10	300.8	3	0	0	999	1014	9
5	1	8	8	11	69.1	0.17	1.043	0.005	594	161	-6.4	0.37	0.38	0.19	0.9	101	10	301.5	3	0	0	999	1014	8
5	1	8	8	12	54.3	0.199	1.022	0.006	711	204	-13.1	0.37	0.38	0.19	1.2	116	10	301.6	3	0	0	999	1013	9
5	1	8	8	13	55.8	0.233	1.078	0.006	812	258	-20.4	0.37	0.38	0.19	1.5	126	10	302	3	0	0	999	1013	9
5	1	8	8	14	50.5	0.252	1.062	0.006	857	291	-28.7	0.37	0.38	0.19	1.7	118	10	301.5	3	0	0	70	1012	9
5	1	8	8	15	35.3	0.212	0.954	0.006	889	225	-24.3	0.37	0.38	0.19	1.4	98	10	301.5	3	0	0	70	1012	10
5	1	8	8	16	15.9	0.176	0.759	0.007	990	170	-31	0.37	0.38	0.21	1.2	87	10	300.9	3	0	0	71	1012	10
5	1	8	8	17	0.1	0.133	0.14	0.007	989	112	-2119.3	0.655	0.64	0.27	0.9	81	10	299.9	3	0	0	72	1012	10
5	1	8	8	18	-0.8	0.051	-9	-9	-999	30	15.8	0.655	0.64	0.51	0.7	79	10	299.2	3	0	0	999	1013	7
5	1	8	8	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	68	10	298.6	3	0	0	999	1013	99
5	1	8	8	20	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	88	10	298.4	3	0	0	999	1014	99
5	1	8	8	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	76	10	298.1	3	0	0	999	1014	99
5	1	8	8	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	85	10	297.8	3	0	0	999	1014	99
5	1	8	8	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	64	10	297.2	3	0	0	999	1014	99
5	1	8	8	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	69	10	297	3	0	0	999	1013	99
5	1	9	9	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	114	10	297	3	0	0	999	1013	99
5	1	9	9	2	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	84	10	296.5	3	0	0	97	1012	7
5	1	9	9	3	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	106	10	296.4	3	0	0	999	1012	7
5	1	9	9	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.2	85	10	296.6	3	0	0.25	999	1013	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	9	9	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	68	10	296.2	3	0	0	999	1013	99
5	1	9	9	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	74	10	295.9	3	0	0	999	1013	99
5	1	9	9	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.2	80	10	296.8	3	0	0	999	1014	99
5	1	9	9	8	41.6	0.305	0.565	0.005	157	387	-61.5	0.655	0.64	0.33	1.8	79	10	299	3	0	0	90	1015	0
5	1	9	9	9	81.4	0.349	0.869	0.005	291	473	-47.1	0.655	0.64	0.22	2	83	10	300.4	3	0	0	82	1015	5
5	1	9	9	10	101.4	0.302	1.089	0.005	461	383	-24.6	0.37	0.38	0.2	2	86	10	302.4	3	0	0	74	1015	0
5	1	9	9	11	116.6	0.296	1.286	0.005	660	370	-20	0.37	0.38	0.19	1.9	94	10	303	3	0	0	74	1014	0
5	1	9	9	12	111.3	0.272	1.366	0.005	828	327	-16.3	0.37	0.38	0.19	1.7	93	10	303.4	3	0	0	65	1013	6
5	1	9	9	13	92.5	0.289	1.328	0.005	914	357	-23.5	0.37	0.38	0.19	1.9	105	10	303.1	3	0	0	70	1012	8
5	1	9	9	14	78.7	0.295	1.291	0.005	987	369	-29.6	0.37	0.38	0.19	2	102	10	303.2	3	0	0	63	1011	8
5	1	9	9	15	43	0.292	1.07	0.005	1025	363	-52.2	0.37	0.38	0.19	2.1	97	10	302.4	3	0	0	65	1011	9
5	1	9	9	16	36.9	0.267	1.026	0.005	1058	318	-46.7	0.37	0.38	0.21	1.9	98	10	301.6	3	0	0	74	1011	9
5	1	9	9	17	4.1	0.182	0.492	0.005	1058	181	-133.5	0.37	0.38	0.27	1.4	88	10	300	3	0	0	79	1011	10
5	1	9	9	18	-2.6	0.154	-9	-9	-999	139	126.9	0.655	0.64	0.51	1.2	74	10	298.6	3	0	0	82	1011	7
5	1	9	9	19	-2.7	0.066	-9	-9	-999	42	9.5	0.655	0.64	1	0.9	83	10	298.2	3	0	0	85	1011	7
5	1	9	9	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	94	10	297.9	3	0	0	88	1012	3
5	1	9	9	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	88	10	297.9	3	0	0	89	1012	3
5	1	9	9	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	90	10	297.8	3	0	0	90	1012	99
5	1	9	9	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	70	10	297.4	3	0	0	91	1012	3
5	1	9	9	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297.5	3	0	0	93	1012	3
5	1	10	10	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	83	10	297.1	3	0	0	95	1011	99
5	1	10	10	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	296.9	3	0	0	97	1010	7
5	1	10	10	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	296.9	3	0	0	97	1010	7
5	1	10	10	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	75	10	296.8	3	0	0	97	1010	99
5	1	10	10	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	56	10	296.6	3	0	0	97	1010	7
5	1	10	10	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	70	10	296.8	3	0	0	96	1012	99
5	1	10	10	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	112	10	297.4	3	0	0	95	1012	99
5	1	10	10	8	27.8	0.163	0.464	0.005	129	152	-14.2	0.37	0.38	0.34	1	86	10	299.4	3	0	0	94	1013	0
5	1	10	10	9	60	0.224	0.779	0.005	284	243	-16.8	0.37	0.38	0.23	1.4	102	10	301.9	3	0	0	999	1013	0
5	1	10	10	10	85.8	0.232	1.069	0.005	514	257	-13.1	0.37	0.38	0.2	1.4	111	10	302.2	3	0	1.27	999	1013	6
5	1	10	10	11	95.7	0.224	1.269	0.005	771	243	-10.5	0.37	0.38	0.19	1.3	116	10	302.5	3	0	0	999	1012	7
5	1	10	10	12	86	0.245	1.285	0.005	891	279	-15.4	0.655	0.64	0.18	1.2	82	10	302.8	3	0	0	999	1011	9
5	1	10	10	13	65.2	0.269	1.21	0.005	978	321	-26.9	0.37	0.38	0.19	1.8	113	10	303.8	3	0	0	999	1010	9
5	1	10	10	14	65	0.237	1.243	0.005	1063	265	-18.3	0.37	0.38	0.19	1.5	107	10	303.4	3	0	0	72	1009	9
5	1	10	10	15	43.4	0.227	1.106	0.005	1120	249	-24.2	0.37	0.38	0.19	1.5	122	10	303.4	3	0	0	999	1009	9
5	1	10	10	16	10.4	0.192	0.688	0.005	1131	193	-61.3	0.37	0.38	0.21	1.4	110	10	302.2	3	0	0	999	1009	10
5	1	10	10	17	1.1	0.139	0.322	0.005	1130	120	-229	0.37	0.38	0.27	1.1	121	10	301	3	0	0	999	1009	10
5	1	10	10	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.51	0.9	110	10	299.8	3	0	0	999	1009	99
5	1	10	10	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	85	10	299	3	0	0	999	1010	99
5	1	10	10	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	298.4	3	0	0	91	1010	3
5	1	10	10	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	68	10	298.1	3	0	0	999	1011	3
5	1	10	10	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	72	10	297.8	3	0	0	999	1011	99
5	1	10	10	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	74	10	297.8	3	0	0	999	1012	99
5	1	10	10	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	78	10	297.9	3	0	0	999	1011	99
5	1	11	11	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	72	10	297.6	3	0	0	999	1011	99
5	1	11	11	2	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.1	80	10	297.4	3	0	0	999	1010	99
5	1	11	11	3	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.3	69	10	297.4	3	0	0	999	1010	99
5	1	11	11	4	-5.4	0.103	-9	-9	-999	76	18.1	0.655	0.64	1	1.4	70	10	297.2	3	0	0	94	1010	10
5	1	11	11	5	-2.2	0.066	-9	-9	-999	39	11.6	0.655	0.64	1	0.9	84	10	296.9	3	0	0.25	97	1011	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	11	11	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	118	10	297.1	3	0	0	100	1012	7
5	1	11	11	7	-5	0.085	-9	-9	-999	57	11.1	0.37	0.38	1	1.4	139	10	298.2	3	0	0	100	1012	7
5	1	11	11	8	26.9	0.225	0.465	0.005	135	245	-38.2	0.736	0.77	0.33	1.2	143	10	299.2	3	0	0	94	1013	4
5	1	11	11	9	89.6	0.232	0.888	0.005	282	257	-12.6	0.655	0.64	0.22	1.1	71	10	301.4	3	0	0	999	1014	0
5	1	11	11	10	57.5	0.223	0.844	0.005	378	242	-17.3	0.37	0.38	0.2	1.4	123	10	302.4	3	0	0	999	1014	8
5	1	11	11	11	123.9	0.264	1.261	0.006	585	312	-13.4	0.736	0.77	0.18	1.2	150	10	303.6	3	0	0	999	1013	8
5	1	11	11	12	74.9	-9	-9	-9	708	-999	-99999	0.542	0.56	0.17	0	0	10	302.9	3	0	0	999	1012	9
5	1	11	11	13	71.8	0.178	1.182	0.007	829	173	-7.1	0.265	0.28	0.14	1.1	284	10	303.5	3	0	2.79	999	1011	8
5	1	11	11	14	87.4	0.232	1.324	0.008	959	256	-12.8	0.655	0.64	0.18	1.1	353	10	302.1	3	0	0	64	1010	9
5	1	11	11	15	23.5	0.162	0.858	0.008	968	151	-16.3	0.655	0.64	0.18	0.8	356	10	300.9	3	0	0.51	999	1010	10
5	1	11	11	16	5.1	0.152	0.516	0.008	970	136	-62.3	0.655	0.64	0.2	0.9	18	10	300.2	3	0	0	999	1010	10
5	1	11	11	17	0.1	0.098	0.139	0.008	970	71	-856.6	0.37	0.38	0.27	0.8	96	10	300.2	3	0	0	999	1010	10
5	1	11	11	18	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	0.5	1.4	83	10	299.2	3	0	0	999	1011	99
5	1	11	11	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.1	74	10	297.6	3	0	0	999	1012	99
5	1	11	11	20	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	84	10	297.2	3	0	0	88	1012	3
5	1	11	11	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	94	10	297	3	0	0	89	1013	3
5	1	11	11	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	88	10	297.2	3	0	0	90	1013	99
5	1	11	11	23	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	76	10	297.2	3	0	0	91	1013	3
5	1	11	11	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	297.2	3	0	0	92	1012	3
5	1	12	12	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	72	10	297.2	3	0	0	94	1012	3
5	1	12	12	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	106	10	297.1	3	0	0	94	1012	0
5	1	12	12	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	297.1	3	0	0	94	1012	3
5	1	12	12	4	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	84	10	297.1	3	0	0	94	1012	3
5	1	12	12	5	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	100	10	297.1	3	0	0	97	1012	0
5	1	12	12	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	297.4	3	0	0	100	1012	3
5	1	12	12	7	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	72	10	299.5	3	0	0	88	1013	3
5	1	12	12	8	44.1	0.228	0.66	0.006	236	250	-24.3	0.655	0.64	0.33	1.2	72	10	301.4	3	0	0	88	1014	0
5	1	12	12	9	72.2	0.282	0.992	0.006	489	345	-28.2	0.37	0.38	0.23	1.9	99	10	302.8	3	0	0	81	1014	0
5	1	12	12	10	78.9	0.274	1.074	0.006	568	330	-23.6	0.37	0.38	0.2	1.8	102	10	303.4	3	0	0	74	1014	7
5	1	12	12	11	100.1	0.258	1.227	0.006	668	302	-15.5	0.37	0.38	0.19	1.6	116	10	304.4	3	0	0	68	1013	6
5	1	12	12	12	112.2	0.25	1.343	0.005	781	287	-12.6	0.37	0.38	0.19	1.5	103	10	305.4	3	0	0	67	1012	6
5	1	12	12	13	38.7	0.29	0.954	0.005	808	359	-56.8	0.655	0.64	0.18	1.7	3	10	301.9	3	0	0	66	1012	10
5	1	12	12	14	86.3	0.159	1.28	0.005	876	154	-4.2	0.655	0.64	0.18	0.6	71	10	303.4	3	0	0	66	1011	9
5	1	12	12	15	33.7	0.222	0.945	0.005	902	240	-29.2	0.37	0.38	0.19	1.5	100	10	303.8	3	0	0	999	1010	10
5	1	12	12	16	14.2	0.207	0.711	0.005	911	217	-56.4	0.37	0.38	0.21	1.5	106	10	302.8	3	0	0	999	1010	10
5	1	12	12	17	0.1	0.17	0.136	0.005	909	162	-4452.3	0.37	0.38	0.27	1.4	104	10	301.1	3	0	0	999	1011	10
5	1	12	12	18	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	0.5	1	83	10	299.9	3	0	0	999	1011	99
5	1	12	12	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	77	10	299	3	0	0	999	1012	99
5	1	12	12	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	298.5	3	0	0	85	1013	3
5	1	12	12	21	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	85	10	298.2	3	0	0	999	1013	3
5	1	12	12	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1	82	10	298.1	3	0	0	999	1013	99
5	1	12	12	23	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	95	10	298.2	3	0	0	999	1013	99
5	1	12	12	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.3	115	10	298.1	3	0	0.25	999	1013	99
5	1	13	13	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	92	10	297.6	3	0	0	999	1012	99
5	1	13	13	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	106	10	297.5	3	0	0	97	1012	7
5	1	13	13	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	297.5	3	0	0.76	999	1012	7
5	1	13	13	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	84	10	297.2	3	0	0.25	999	1012	99
5	1	13	13	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	66	10	297	3	0	0	999	1012	99
5	1	13	13	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	82	10	297	3	0	0	999	1013	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	13	13	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	93	10	297.5	3	0	0.25	999	1014	99
5	1	13	13	8	20.7	0.225	0.427	0.005	135	246	-49.8	0.655	0.64	0.33	1.3	82	10	298.8	3	0	0	97	1015	7
5	1	13	13	9	53	0.242	0.701	0.005	235	274	-24.2	0.37	0.38	0.23	1.6	91	10	300.4	3	0	0	90	1015	6
5	1	13	13	10	100.4	0.28	1.056	0.005	425	342	-19.9	0.37	0.38	0.2	1.8	100	10	302.9	3	0	0	83	1015	0
5	1	13	13	11	35.3	0.236	0.781	0.005	487	264	-33.5	0.655	0.64	0.18	1.3	80	10	299.1	3	0	10.92	77	1014	10
5	1	13	13	12	48.7	0.262	0.92	0.005	578	309	-33.4	0.37	0.38	0.19	1.8	91	10	299.6	3	0	4.06	77	1013	10
5	1	13	13	13	37.2	0.18	0.873	0.005	647	178	-14.2	0.37	0.38	0.19	1.1	118	10	299	3	0	0.51	77	1013	10
5	1	13	13	14	43.6	0.26	0.959	0.005	730	305	-36.4	0.37	0.38	0.19	1.8	115	10	299.8	3	0	0.51	77	1012	10
5	1	13	13	15	25.4	0.184	0.828	0.005	806	183	-22.2	0.37	0.38	0.19	1.2	107	10	298.4	3	0	0.25	999	1012	10
5	1	13	13	16	19	0.168	0.756	0.005	819	159	-22.6	0.37	0.38	0.21	1.1	96	10	299.1	3	0	0	999	1012	10
5	1	13	13	17	0.5	0.122	0.228	0.005	819	98	-316.6	0.655	0.64	0.26	0.8	76	10	298.9	3	0	0	999	1012	10
5	1	13	13	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.5	0.9	106	10	298.2	3	0	1.78	999	1012	99
5	1	13	13	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	96	10	297.4	3	0	3.56	999	1013	99
5	1	13	13	20	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	49	10	297.4	3	0	0.76	999	1013	99
5	1	13	13	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	65	10	297.2	3	0	0.25	999	1014	99
5	1	13	13	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	102	10	297.2	3	0	0	999	1014	99
5	1	13	13	23	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	96	10	297.2	3	0	0	999	1013	99
5	1	13	13	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	39	10	297.1	3	0	0	999	1013	99
5	1	14	14	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	66	10	297	3	0	0	999	1012	99
5	1	14	14	2	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	55	10	296.9	3	0	0	999	1011	99
5	1	14	14	3	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	99	10	296.9	3	0	0	999	1011	99
5	1	14	14	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	120	10	296.9	3	0	0	999	1011	99
5	1	14	14	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	106	10	297	3	0	0	999	1012	99
5	1	14	14	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	88	10	297.4	3	0	0	999	1012	99
5	1	14	14	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1	82	10	298.1	3	0	0	999	1013	99
5	1	14	14	8	19.8	0.211	0.416	0.005	131	223	-42.9	0.655	0.64	0.33	1.2	70	10	300	3	0	0	91	1014	0
5	1	14	14	9	65.9	0.258	0.782	0.005	262	302	-23.6	0.37	0.38	0.23	1.7	87	10	301.9	3	0	0	80	1014	0
5	1	14	14	10	79.8	0.296	1.065	0.005	546	370	-29.3	0.37	0.38	0.2	2	88	10	302.6	3	0	0	77	1014	7
5	1	14	14	11	99.3	0.323	1.312	0.005	822	423	-30.8	0.37	0.38	0.19	2.2	86	10	302.4	3	0	0	75	1013	6
5	1	14	14	12	142	0.418	1.579	0.005	1002	622	-46.5	0.655	0.64	0.18	2.4	80	10	303	3	0	0	66	1012	7
5	1	14	14	13	132	0.429	1.619	0.005	1161	646	-53.9	0.655	0.64	0.18	2.5	82	10	301.1	3	0	0	75	1012	8
5	1	14	14	14	55.8	0.364	1.227	0.005	1196	507	-77.8	0.655	0.64	0.18	2.2	78	10	300.1	3	0	0	91	1011	10
5	1	14	14	15	64.5	0.368	1.303	0.005	1237	513	-69.6	0.655	0.64	0.18	2.2	85	10	300.4	3	0	0	94	1010	9
5	1	14	14	16	26.8	0.261	0.977	0.005	1254	312	-59.7	0.37	0.38	0.21	1.9	86	10	300.4	3	0	0	82	1010	10
5	1	14	14	17	8.8	0.278	0.674	0.005	1258	338	-221.4	0.655	0.64	0.26	1.8	75	10	299.1	3	0	0.76	82	1011	10
5	1	14	14	18	-0.9	0.138	-9	-9	-999	129	269.8	0.37	0.38	0.5	1.2	91	10	298	3	0	0.51	999	1012	7
5	1	14	14	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	86	10	298	3	0	0	999	1012	99
5	1	14	14	20	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	88	10	297.9	3	0	0	999	1012	99
5	1	14	14	21	-6.7	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	85	10	297.6	3	0	0	94	1013	7
5	1	14	14	22	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	88	10	297.4	3	0	0	92	1013	7
5	1	14	14	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	72	10	297.4	3	0	0	91	1012	7
5	1	14	14	24	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	71	10	297.5	3	0	0	94	1012	7
5	1	15	15	1	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	89	10	297.1	3	0	0.51	94	1012	7
5	1	15	15	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	107	10	296.9	3	0	0	97	1011	7
5	1	15	15	3	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	62	10	296.8	3	0	0	100	1010	0
5	1	15	15	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	46	10	296.5	3	0	0	100	1010	7
5	1	15	15	5	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	60	10	296.6	3	0	0.76	94	1010	7
5	1	15	15	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	85	10	296.5	3	0	0.25	97	1011	7
5	1	15	15	7	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	76	10	296.9	3	0	0	92	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	15	15	8	14.4	0.164	0.393	0.005	152	153	-27.6	0.37	0.38	0.34	1.1	99	10	298.1	3	0	0	87	1013	8
5	1	15	15	9	52.9	0.209	0.721	0.005	256	220	-15.7	0.37	0.38	0.23	1.3	131	10	300	3	0	0	82	1013	6
5	1	15	15	10	56.8	0.2	0.82	0.005	350	205	-12.7	0.37	0.38	0.2	1.2	129	10	300.4	3	0	0	75	1013	8
5	1	15	15	11	15.4	0.241	0.542	0.005	374	272	-82.2	0.37	0.38	0.19	1.8	132	10	297.9	3	0	13.21	72	1013	10
5	1	15	15	12	55.8	0.233	0.898	0.005	468	258	-20.4	0.37	0.38	0.19	1.5	124	10	298.9	3	0	0.76	94	1012	9
5	1	15	15	13	42.2	0.237	0.857	0.005	538	266	-28.6	0.37	0.38	0.19	1.6	99	10	299	3	0	0.76	94	1011	10
5	1	15	15	14	61.3	0.246	1.03	0.005	642	281	-21.9	0.37	0.38	0.19	1.6	97	10	300.2	3	0	0	94	1010	9
5	1	15	15	15	32.3	0.2	0.855	0.005	696	205	-22.1	0.37	0.38	0.19	1.3	94	10	300.2	3	0	0	88	1010	10
5	1	15	15	16	7.9	0.189	0.538	0.005	707	188	-76.1	0.37	0.38	0.21	1.4	102	10	298.9	3	0	0	92	1010	10
5	1	15	15	17	0.1	0.146	0.126	0.005	706	129	-2766.7	0.37	0.38	0.27	1.2	111	10	298.2	3	0	0	97	1010	10
5	1	15	15	18	-0.7	0.042	-9	-9	-999	30	10.4	0.37	0.38	0.49	0.7	116	10	297.1	3	0	0	96	1010	10
5	1	15	15	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	93	10	297.2	3	0	0	95	1011	99
5	1	15	15	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	65	10	297	3	0	0	94	1012	7
5	1	15	15	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	80	10	296.9	3	0	0	94	1012	7
5	1	15	15	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	79	10	296.9	3	0	0	94	1012	99
5	1	15	15	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	68	10	296.9	3	0	0	94	1012	7
5	1	15	15	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	35	10	296.8	3	0	0	999	1011	7
5	1	16	16	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	51	10	296.9	3	0	0	999	1010	99
5	1	16	16	2	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	101	10	296.9	3	0	0	999	1010	99
5	1	16	16	3	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	114	10	297	3	0	0	999	1010	99
5	1	16	16	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	110	10	297.1	3	0	0	999	1009	99
5	1	16	16	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	66	10	297.1	3	0	0	999	1009	99
5	1	16	16	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	89	10	297	3	0	0	999	1010	99
5	1	16	16	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	80	10	297.8	3	0	0	999	1011	99
5	1	16	16	8	30.1	0.206	0.492	0.005	142	216	-26.4	0.655	0.64	0.33	1.1	72	10	300.1	3	0	0	94	1012	0
5	1	16	16	9	66.9	0.169	0.824	0.005	302	159	-6.5	0.655	0.64	0.22	0.7	42	10	301.6	3	0	0	999	1012	7
5	1	16	16	10	26.1	0.15	0.64	0.005	362	133	-11.6	0.655	0.64	0.19	0.7	43	10	299.4	3	0	7.11	999	1013	10
5	1	16	16	11	13.1	0.23	0.522	0.005	391	254	-84	0.655	0.64	0.18	1.4	14	10	297.8	3	0	11.68	999	1012	10
5	1	16	16	12	18.3	0.144	0.604	0.005	434	128	-14.7	0.655	0.64	0.18	0.7	70	10	297.2	3	0	3.05	999	1012	10
5	1	16	16	13	11.4	0.161	0.535	0.005	483	148	-32.7	0.37	0.38	0.19	1.1	125	10	297.1	3	0	5.33	999	1010	10
5	1	16	16	14	51	0.205	1.002	0.005	711	213	-15.2	0.655	0.64	0.18	1	76	10	297.8	3	0	1.52	97	1009	10
5	1	16	16	15	72.9	0.227	1.19	0.005	831	249	-14.5	0.655	0.64	0.18	1.1	44	10	299.4	3	0	0.25	999	1008	9
5	1	16	16	16	24.1	0.202	0.83	0.005	855	209	-30.8	0.655	0.64	0.2	1.1	33	10	299.4	3	0	0	999	1008	10
5	1	16	16	17	5.3	0.14	0.502	0.005	859	121	-46.1	0.655	0.64	0.26	0.8	54	10	298.6	3	0	0	999	1008	10
5	1	16	16	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.49	0.6	113	10	297.9	3	0	0	999	1009	99
5	1	16	16	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.4	3	0	0	999	1009	99
5	1	16	16	20	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	78	10	297	3	0	0	999	1010	99
5	1	16	16	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	59	10	296.9	3	0	0	999	1010	99
5	1	16	16	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	64	10	296.5	3	0	0	999	1010	99
5	1	16	16	23	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	103	10	296.4	3	0	0	97	1011	3
5	1	16	16	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	296	3	0	0	98	1010	3
5	1	17	17	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	100	10	295.8	3	0	0	99	1010	99
5	1	17	17	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	295.8	3	0	0	100	1009	3
5	1	17	17	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	295.5	3	0	0	100	1009	3
5	1	17	17	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	295.5	3	0	0	100	1009	3
5	1	17	17	5	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	86	10	295.4	3	0	0	100	1010	0
5	1	17	17	6	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	80	10	295.6	3	0	0	93	1010	3
5	1	17	17	7	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	80	10	298.9	3	0	0	100	1011	3
5	1	17	17	8	20	0.146	0.381	0.008	100	128	-13.9	0.655	0.64	0.33	0.7	50	10	300.4	3	0	0	91	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	17	17	9	84.3	0.203	0.804	0.006	222	210	-9	0.655	0.64	0.22	0.9	25	10	301	3	0	0	999	1013	0
5	1	17	17	10	114.6	0.225	1.074	0.005	390	246	-9	0.655	0.64	0.19	1	7	10	302.1	3	0	0	999	1013	7
5	1	17	17	11	83.5	0.271	1.058	0.005	512	324	-21.4	0.655	0.64	0.18	1.4	350	10	301.9	3	0	0	999	1012	9
5	1	17	17	12	65.5	0.29	1.117	0.005	768	359	-33.5	0.655	0.64	0.18	1.6	352	10	301.4	3	0	0.25	999	1010	10
5	1	17	17	13	31.2	0.143	0.887	0.005	804	138	-8.4	0.37	0.38	0.19	0.8	137	10	300	3	0	0	999	1009	10
5	1	17	17	14	38.7	-9	-9	-9	853	-999	-99999	0.542	0.56	0.17	0	0	10	300.8	3	0	0	999	1008	10
5	1	17	17	15	76	0.214	1.26	0.007	947	228	-11.6	0.655	0.64	0.18	1	2	10	301.8	3	0	0	999	1008	9
5	1	17	17	16	10.8	0.138	0.661	0.007	957	120	-22	0.37	0.38	0.21	0.9	115	10	300.1	3	0	0	999	1009	10
5	1	17	17	17	1	0.099	0.303	0.007	957	71	-82.8	0.655	0.64	0.26	0.6	78	10	299.9	3	0	0	999	1009	10
5	1	17	17	18	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	0.48	0.7	51	10	299.1	3	0	1.02	999	1009	99
5	1	17	17	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	54	10	298.1	3	0	0	999	1010	99
5	1	17	17	20	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	53	10	297.9	3	0	0	999	1010	99
5	1	17	17	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	70	10	297.4	3	0	0	999	1011	99
5	1	17	17	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	67	10	297.2	3	0	0	999	1011	99
5	1	17	17	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	40	10	297.4	3	0	0	999	1011	99
5	1	17	17	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	32	10	297.4	3	0	0	999	1010	99
5	1	18	18	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	73	10	297.1	3	0	0	999	1010	99
5	1	18	18	2	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	73	10	297	3	0	0	999	1009	99
5	1	18	18	3	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	87	10	297	3	0	0	999	1009	99
5	1	18	18	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	58	10	296.9	3	0	0	999	1009	99
5	1	18	18	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	24	10	296.6	3	0	0	999	1009	99
5	1	18	18	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	75	10	296.9	3	0	0	999	1010	99
5	1	18	18	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.6	96	10	298.9	3	0	0	999	1011	99
5	1	18	18	8	37.6	0.185	0.67	0.005	289	182	-15.1	0.655	0.64	0.33	0.9	31	10	300.5	3	0	0	999	1012	0
5	1	18	18	9	83	0.23	1.208	0.005	766	254	-13.3	0.655	0.64	0.22	1.1	24	10	301.9	3	0	0	79	1012	0
5	1	18	18	10	130.7	0.311	1.521	0.006	973	398	-20.7	0.655	0.64	0.19	1.6	27	10	302.6	3	0	0	999	1013	4
5	1	18	18	11	106.8	0.37	1.454	0.006	1039	517	-42.6	0.655	0.64	0.18	2.1	346	10	301.9	3	0	0	999	1012	8
5	1	18	18	12	139.1	0.47	1.63	0.006	1125	740	-67.2	0.655	0.64	0.18	2.8	350	10	301	3	0	0	999	1012	7
5	1	18	18	13	159.7	0.409	1.757	0.006	1227	605	-38.7	0.655	0.64	0.18	2.3	354	10	302.2	3	0	0	999	1010	7
5	1	18	18	14	125.3	0.401	1.656	0.007	1305	584	-46.3	0.655	0.64	0.18	2.3	353	10	302.4	3	0	0	59	1009	8
5	1	18	18	15	94.2	0.392	1.527	0.007	1364	565	-57.6	0.655	0.64	0.18	2.3	354	10	302.4	3	0	0	62	1009	8
5	1	18	18	16	50	0.361	1.246	0.007	1395	500	-84.9	0.655	0.64	0.2	2.2	358	10	301.9	3	0	0	66	1009	9
5	1	18	18	17	4.4	0.3	0.556	0.007	1394	380	-548.8	0.655	0.64	0.25	2	352	10	300.1	3	0	0	70	1010	10
5	1	18	18	18	0.1	0.235	0.157	0.007	1392	264	-8888	0.655	0.64	0.47	1.6	357	10	299.4	3	0	0	73	1010	7
5	1	18	18	19	-1	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.1	23	10	298.9	3	0	0	76	1011	99
5	1	18	18	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	45	10	298	3	0	0	79	1012	7
5	1	18	18	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	297.8	3	0	0	999	1012	7
5	1	18	18	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	95	10	297.4	3	0	0	999	1012	99
5	1	18	18	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	70	10	297.4	3	0	0	999	1012	99
5	1	18	18	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	40	10	297.1	3	0	0	999	1011	99
5	1	19	19	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	45	10	296.8	3	0	0	999	1010	99
5	1	19	19	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	36	10	297.2	3	0	0	85	1010	7
5	1	19	19	3	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	24	10	297.5	3	0	0	999	1010	7
5	1	19	19	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	38	10	297.1	3	0	0	999	1010	99
5	1	19	19	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.3	10	10	297.5	3	0	0	999	1010	99
5	1	19	19	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.5	352	10	297.9	3	0	0	999	1010	99
5	1	19	19	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.4	352	10	299.6	3	0	0	999	1011	99
5	1	19	19	8	24.8	0.268	0.349	0.005	62	318	-69.6	0.655	0.64	0.33	1.6	350	10	300.1	3	0	0	85	1012	5
5	1	19	19	9	45.5	0.254	0.588	0.005	162	295	-32.7	0.655	0.64	0.22	1.4	7	10	299.4	3	0	1.78	999	1013	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	19	19	10	83.1	0.297	0.92	0.005	338	372	-28.5	0.655	0.64	0.19	1.6	6	10	299.5	3	0	0	999	1013	8
5	1	19	19	11	73	0.332	0.999	0.005	493	440	-45.3	0.655	0.64	0.18	1.9	347	10	298.9	3	0	0.25	999	1013	9
5	1	19	19	12	140.6	0.405	1.452	0.006	786	592	-42.6	0.655	0.64	0.18	2.3	343	10	300.4	3	0	0	999	1012	7
5	1	19	19	13	141	0.431	1.52	0.006	900	651	-51.3	0.655	0.64	0.18	2.5	348	10	300.9	3	0	0	999	1011	8
5	1	19	19	14	102.6	0.395	1.4	0.006	963	571	-53.9	0.655	0.64	0.18	2.3	350	10	300.1	3	0	0	85	1010	9
5	1	19	19	15	42.4	0.384	1.052	0.006	988	547	-120.1	0.655	0.64	0.18	2.4	2	10	299.1	3	0	0	82	1010	10
5	1	19	19	16	7.3	0.346	0.585	0.006	990	469	-512.5	0.655	0.64	0.2	2.3	352	10	297.4	3	0	0.51	88	1010	10
5	1	19	19	17	0.1	0.308	0.14	0.006	990	394	-8888	0.655	0.64	0.25	2.1	1	10	297.2	3	0	0	91	1010	10
5	1	19	19	18	0.1	0.264	0.14	0.006	990	313	-8888	0.655	0.64	0.47	1.8	16	10	296.9	3	0	0	94	1010	7
5	1	19	19	19	-9.8	0.125	-9	-9	-999	113	17.9	0.655	0.64	1	1.7	15	10	297.5	3	0	0	88	1010	7
5	1	19	19	20	-2.8	0.066	-9	-9	-999	40	9.4	0.655	0.64	1	0.9	47	10	297	3	0	0	82	1012	7
5	1	19	19	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	38	10	297	3	0	0	85	1012	7
5	1	19	19	22	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	57	10	297	3	0	0	74	1012	7
5	1	19	19	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	297.2	3	0	0	82	1012	7
5	1	19	19	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	83	10	297.1	3	0	0	79	1011	7
5	1	20	20	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	297.1	3	0	0	79	1010	7
5	1	20	20	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	63	10	297	3	0	0	90	1010	7
5	1	20	20	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	52	10	297.1	3	0	0	94	1009	3
5	1	20	20	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	36	10	297	3	0	0	100	1009	3
5	1	20	20	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	35	10	297.1	3	0	0	97	1010	3
5	1	20	20	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	56	10	296.9	3	0	0	97	1011	7
5	1	20	20	7	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	68	10	299.6	3	0	0	89	1012	7
5	1	20	20	8	25.6	0.15	0.463	0.005	140	133	-11.8	0.655	0.64	0.33	0.7	55	10	300.9	3	0	0	82	1013	6
5	1	20	20	9	82.1	0.173	0.899	0.005	320	166	-5.7	0.655	0.64	0.22	0.7	27	10	302	3	0	0	999	1014	4
5	1	20	20	10	113.2	0.28	1.212	0.005	570	341	-17.5	0.655	0.64	0.19	1.4	345	10	302.6	3	0	0	999	1014	7
5	1	20	20	11	141.2	0.379	1.475	0.005	823	536	-34.8	0.655	0.64	0.18	2.1	346	10	302.2	3	0	0	999	1013	7
5	1	20	20	12	130.9	0.416	1.508	0.006	947	616	-49.5	0.655	0.64	0.18	2.4	346	10	302.4	3	0	0	999	1013	8
5	1	20	20	13	62	0.406	1.199	0.006	1004	595	-97.3	0.655	0.64	0.18	2.5	350	10	301.5	3	0	0	999	1012	10
5	1	20	20	14	132.6	0.442	1.607	0.005	1131	676	-58.8	0.655	0.64	0.18	2.6	347	10	302.4	3	0	0	56	1011	8
5	1	20	20	15	99.5	0.433	1.5	0.005	1224	655	-73.3	0.655	0.64	0.18	2.6	345	10	302.1	3	0	0	56	1010	8
5	1	20	20	16	58.8	0.405	1.268	0.005	1252	593	-101.5	0.655	0.64	0.2	2.5	349	10	301.9	3	0	0	56	1010	9
5	1	20	20	17	11.3	0.322	0.733	0.005	1255	424	-266.6	0.655	0.64	0.25	2.1	353	10	300.6	3	0	0	61	1010	10
5	1	20	20	18	0.1	0.25	0.152	0.005	1254	289	-8888	0.655	0.64	0.47	1.7	6	10	299.8	3	0	0	72	1011	7
5	1	20	20	19	-6.6	0.103	-9	-9	-999	92	14.7	0.655	0.64	1	1.4	16	10	299.2	3	0	0	74	1011	7
5	1	20	20	20	-8.8	0.11	-9	-9	-999	84	13.7	0.655	0.64	1	1.5	8	10	299.4	3	0	0	77	1012	0
5	1	20	20	21	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	33	10	298.9	3	0	0	77	1012	7
5	1	20	20	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	66	10	297.6	3	0	0	82	1013	7
5	1	20	20	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	297.5	3	0	0	88	1013	7
5	1	20	20	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	296.9	3	0	0	88	1012	7
5	1	21	21	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	296.9	3	0	0	88	1011	7
5	1	21	21	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	296.9	3	0	0	88	1011	7
5	1	21	21	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	71	10	297	3	0	0	79	1010	7
5	1	21	21	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	82	10	297.4	3	0	0	999	1011	7
5	1	21	21	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	81	10	297.2	3	0	0	999	1012	99
5	1	21	21	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	51	10	297.2	3	0	0	999	1012	99
5	1	21	21	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	49	10	298	3	0	0	999	1013	99
5	1	21	21	8	25.6	0.149	0.466	0.005	142	133	-11.8	0.655	0.64	0.33	0.7	46	10	300.1	3	0	0	999	1014	0
5	1	21	21	9	80.8	0.202	0.893	0.005	319	209	-9.2	0.655	0.64	0.22	0.9	22	10	302.4	3	0	0	999	1015	5
5	1	21	21	10	53.9	0.246	0.865	0.005	435	281	-25	0.655	0.64	0.19	1.3	342	10	301.4	3	0	0	999	1015	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	21	21	11	90.8	0.313	1.167	0.005	634	402	-30.4	0.655	0.64	0.18	1.7	340	10	301.9	3	0	0	999	1014	9
5	1	21	21	12	69.4	0.252	1.146	0.005	785	292	-20.9	0.655	0.64	0.18	1.3	358	10	301.9	3	0	0	999	1014	10
5	1	21	21	13	43.4	0.214	1.004	0.005	842	228	-20.4	0.655	0.64	0.18	1.1	44	10	300.4	3	0	0.25	999	1013	10
5	1	21	21	14	64.9	0.342	1.184	0.005	924	460	-55.6	0.655	0.64	0.18	2	77	10	300.4	3	0	0.25	94	1012	10
5	1	21	21	15	42.7	0.279	1.04	0.005	951	341	-46	0.655	0.64	0.18	1.6	78	10	299.6	3	0	0	999	1012	10
5	1	21	21	16	13	0.283	0.701	0.005	958	347	-158.4	0.37	0.38	0.2	2.2	100	10	299.1	3	0	0	999	1013	10
5	1	21	21	17	1.1	0.233	0.31	0.005	957	259	-1024.7	0.37	0.38	0.26	1.9	98	10	297.8	3	0	0	999	1013	10
5	1	21	21	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.47	1.4	86	10	297.2	3	0	0	999	1013	99
5	1	21	21	19	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1.2	70	10	297.1	3	0	0	999	1014	99
5	1	21	21	20	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	70	10	297	3	0	0	90	1014	7
5	1	21	21	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	88	10	297	3	0	0	91	1015	7
5	1	21	21	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	86	10	297.1	3	0	0	92	1015	99
5	1	21	21	23	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	100	10	297.4	3	0	0	94	1014	7
5	1	21	21	24	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	96	10	297.4	3	0	0.25	95	1014	7
5	1	22	22	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	32	10	296.9	3	0	0	96	1014	99
5	1	22	22	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	34	10	296.6	3	0	0	97	1013	7
5	1	22	22	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	69	10	296.8	3	0	0	98	1013	7
5	1	22	22	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	116	10	296.9	3	0	0	100	1013	7
5	1	22	22	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	296.8	3	0	0	100	1013	7
5	1	22	22	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	65	10	296.5	3	0	0	100	1013	7
5	1	22	22	7	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	66	10	297.4	3	0	0	94	1014	7
5	1	22	22	8	24	0.189	0.463	0.005	149	189	-25.4	0.655	0.64	0.33	1	65	10	299.4	3	0	0	94	1015	4
5	1	22	22	9	78.8	0.308	0.878	0.005	311	393	-33.6	0.655	0.64	0.22	1.7	74	10	301.6	3	0	0	999	1016	6
5	1	22	22	10	62.7	0.302	0.905	0.005	427	381	-39.7	0.655	0.64	0.19	1.7	81	10	301.2	3	0	0.25	999	1015	9
5	1	22	22	11	20.5	0.235	0.632	0.005	445	263	-57	0.37	0.38	0.19	1.7	111	10	298.2	3	0	5.08	999	1015	10
5	1	22	22	12	43.7	0.227	1.029	0.005	904	249	-24.3	0.37	0.38	0.19	1.5	103	10	299.6	3	0	0	999	1015	10
5	1	22	22	13	74.2	0.306	1.288	0.006	1042	390	-35	0.655	0.64	0.18	1.7	83	10	300.9	3	0	0	999	1014	9
5	1	22	22	14	83.5	0.336	1.386	0.006	1153	448	-41	0.655	0.64	0.18	1.9	83	10	301.4	3	0	0	91	1013	9
5	1	22	22	15	20	0.245	0.863	0.006	1162	282	-66.4	0.37	0.38	0.19	1.8	87	10	300.5	3	0	0	87	1013	10
5	1	22	22	16	9.5	0.169	0.673	0.006	1166	161	-46.1	0.37	0.38	0.2	1.2	113	10	299.6	3	0	0	83	1013	10
5	1	22	22	17	0.6	0.137	0.271	0.006	1166	117	-378.7	0.37	0.38	0.26	1.1	89	10	299.6	3	0	0	79	1013	10
5	1	22	22	18	0.1	0.146	0.148	0.006	1166	129	-2825.4	0.37	0.38	0.47	1.2	88	10	299.1	3	0	0	79	1014	7
5	1	22	22	19	-3.6	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1	84	10	298.9	3	0	0	79	1015	99
5	1	22	22	20	-7.4	0.103	-9	-9	-999	76	13.4	0.37	0.38	1	1.7	107	10	298.5	3	0	0	79	1016	7
5	1	22	22	21	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	63	10	297.5	3	0	0.25	999	1016	7
5	1	22	22	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	77	10	297	3	0	0	999	1016	99
5	1	22	22	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	84	10	296.9	3	0	0	999	1015	99
5	1	22	22	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	88	10	297.4	3	0	0	999	1015	99
5	1	23	23	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	82	10	297.4	3	0	0	999	1015	99
5	1	23	23	2	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	89	10	297.4	3	0	0	94	1014	7
5	1	23	23	3	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	93	10	297.8	3	0	0	999	1013	7
5	1	23	23	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	91	10	297.4	3	0	0	999	1013	99
5	1	23	23	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	52	10	296.8	3	0	0	999	1013	99
5	1	23	23	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	56	10	296.4	3	0	0	999	1014	99
5	1	23	23	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.3	114	10	298.9	3	0	0	999	1015	99
5	1	23	23	8	35.3	0.266	0.586	0.005	206	316	-48.5	0.37	0.38	0.34	1.9	103	10	301.2	3	0	0	88	1016	0
5	1	23	23	9	71	0.336	0.894	0.005	365	448	-48.6	0.37	0.38	0.23	2.4	105	10	302.4	3	0	0	81	1016	0
5	1	23	23	10	115.7	0.393	1.259	0.005	625	567	-47.6	0.37	0.38	0.2	2.8	114	10	303.6	3	0	0	74	1016	0
5	1	23	23	11	116.1	0.393	1.39	0.005	839	567	-47.4	0.37	0.38	0.19	2.8	105	10	303.9	3	0	0	68	1016	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	23	23	12	110.5	0.392	1.412	0.007	924	564	-49.3	0.37	0.38	0.19	2.8	110	10	304	3	0	0	65	1015	7
5	1	23	23	13	120.6	0.384	1.493	0.009	999	547	-42.3	0.37	0.38	0.19	2.7	107	10	304.4	3	0	0	63	1014	6
5	1	23	23	14	102.8	0.379	1.459	0.009	1093	536	-47.8	0.37	0.38	0.19	2.7	108	10	304	3	0	0	61	1013	7
5	1	23	23	15	63.4	0.334	1.272	0.01	1173	444	-52.8	0.37	0.38	0.19	2.4	114	10	303.2	3	0	0	63	1013	9
5	1	23	23	16	25.2	0.293	0.943	0.01	1203	365	-89.8	0.37	0.38	0.2	2.2	113	10	302.4	3	0	0	65	1013	10
5	1	23	23	17	6.9	0.231	0.613	0.01	1207	257	-162.8	0.37	0.38	0.26	1.8	112	10	301	3	0	0	70	1013	10
5	1	23	23	18	0.1	0.134	0.15	0.01	1202	116	-2181.1	0.37	0.38	0.46	1.1	98	10	299.6	3	0	0	74	1013	7
5	1	23	23	19	-1.7	0.051	-9	-9	-999	31	7.4	0.655	0.64	1	0.7	70	10	298.8	3	0	0	79	1014	7
5	1	23	23	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	89	10	298	3	0	0	85	1014	3
5	1	23	23	21	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	106	10	297.6	3	0	0	86	1015	3
5	1	23	23	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	71	10	297.2	3	0	0	87	1015	99
5	1	23	23	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	296.9	3	0	0	88	1015	3
5	1	23	23	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	296.9	3	0	0	87	1015	3
5	1	24	24	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	106	10	297.1	3	0	0	86	1014	99
5	1	24	24	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	296.9	3	0	0	85	1014	3
5	1	24	24	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	296.5	3	0	0	999	1014	3
5	1	24	24	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	91	10	296.2	3	0	0	999	1013	99
5	1	24	24	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	93	10	295.9	3	0	0	999	1014	99
5	1	24	24	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	77	10	296	3	0	0	999	1014	99
5	1	24	24	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	75	10	298.9	3	0	0	999	1015	99
5	1	24	24	8	34.4	0.201	-9	-9	-999	207	-21.3	0.37	0.38	0.34	1.3	102	10	301.4	3	0	0	79	1016	0
5	1	24	24	9	75.8	0.305	-9	-9	-999	388	-34	0.37	0.38	0.23	2.1	118	10	302.5	3	0	0	72	1016	0
5	1	24	24	10	88.7	0.298	-9	-9	-999	375	-27.2	0.37	0.38	0.2	2	114	10	303.4	3	0	0	65	1016	5
5	1	24	24	11	86.3	0.265	-9	-9	-999	315	-19.6	0.37	0.38	0.19	1.7	111	10	303.6	3	0	0	65	1016	8
5	1	24	24	12	99.7	0.28	-9	-9	-999	341	-20	0.37	0.38	0.19	1.8	108	10	302.4	3	0	0.51	65	1015	7
5	1	24	24	13	114.2	0.338	-9	-9	-999	453	-30.6	0.37	0.38	0.19	2.3	119	10	303.9	3	0	0	65	1014	7
5	1	24	24	14	79	0.306	-9	-9	-999	391	-32.9	0.37	0.38	0.19	2.1	108	10	303.9	3	0	0	63	1013	8
5	1	24	24	15	78.4	0.361	-9	-9	-999	498	-54	0.37	0.38	0.19	2.6	128	10	303.2	3	0	0	63	1013	8
5	1	24	24	16	35	0.288	-9	-9	-999	357	-61.3	0.37	0.38	0.2	2.1	116	10	302.5	3	0	0	70	1013	9
5	1	24	24	17	8	0.244	-9	-9	-999	278	-163.6	0.37	0.38	0.26	1.9	117	10	301	3	0	0	67	1013	10
5	1	24	24	18	0.1	0.134	-9	-9	-999	118	-2181.1	0.37	0.38	0.46	1.1	110	10	299	3	0	0	74	1013	7
5	1	24	24	19	-2.1	0.055	-9	-9	-999	33	7.1	0.37	0.38	1	0.9	99	10	298.2	3	0	0	79	1013	7
5	1	24	24	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	95	10	297.8	3	0	0	85	1014	0
5	1	24	24	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	297.2	3	0	0	85	1015	3
5	1	24	24	22	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	95	10	296.6	3	0	0	85	1015	3
5	1	24	24	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	296.6	3	0	0	97	1015	3
5	1	24	24	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	83	10	296.5	3	0	0	97	1015	3
5	1	25	25	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	295.9	3	0	0	97	1014	3
5	1	25	25	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	104	10	295.4	3	0	0	90	1013	3
5	1	25	25	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	111	10	295.4	3	0	0	91	1013	3
5	1	25	25	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	130	10	295.8	3	0	0	92	1013	99
5	1	25	25	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	82	10	295.2	3	0	0	93	1013	7
5	1	25	25	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	80	10	295	3	0	0	93	1014	7
5	1	25	25	7	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	297.8	3	0	0	90	1015	7
5	1	25	25	8	30.7	0.154	0.503	0.005	150	139	-10.8	0.37	0.38	0.34	0.9	104	10	299.6	3	0	0	87	1015	0
5	1	25	25	9	74.4	0.228	0.844	0.005	293	251	-14.5	0.37	0.38	0.23	1.4	88	10	302	3	0	0	999	1016	0
5	1	25	25	10	98	0.28	1.092	0.005	481	340	-20.2	0.37	0.38	0.2	1.8	93	10	302.8	3	0	0	999	1016	0
5	1	25	25	11	118.3	0.263	1.504	0.005	1042	310	-13.9	0.37	0.38	0.19	1.6	95	10	303.4	3	0	0	999	1015	2
5	1	25	25	12	130.4	0.243	1.667	0.005	1289	276	-10	0.37	0.38	0.19	1.4	112	10	304.1	3	0	0	999	1015	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	25	25	13	126.9	0.276	1.713	0.012	1435	333	-14.9	0.37	0.38	0.19	1.7	113	10	304.4	3	0	0	999	1013	6
5	1	25	25	14	88.8	0.299	1.555	0.014	1530	375	-27.1	0.37	0.38	0.19	2	120	10	303.4	3	0	0	52	1013	8
5	1	25	25	15	74.8	0.272	1.489	0.013	1595	327	-24.4	0.37	0.38	0.19	1.8	117	10	303.5	3	0	0	51	1012	8
5	1	25	25	16	46.1	0.261	1.281	0.013	1646	307	-34.8	0.37	0.38	0.2	1.8	98	10	302.6	3	0	0	55	1012	9
5	1	25	25	17	9.2	0.201	0.75	0.013	1648	209	-79.8	0.37	0.38	0.25	1.5	89	10	301.1	3	0	0	63	1013	10
5	1	25	25	18	-0.2	0.16	-9	-9	-999	147	1583.8	0.655	0.64	0.45	1.1	83	10	299.1	3	0	0	65	1013	3
5	1	25	25	19	-3.4	0.073	-9	-9	-999	48	10.5	0.655	0.64	1	1	81	10	298.1	3	0	0	74	1014	7
5	1	25	25	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	67	10	297.1	3	0	0	79	1014	0
5	1	25	25	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	66	10	296.6	3	0	0	84	1015	3
5	1	25	25	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	75	10	296.2	3	0	0	90	1015	3
5	1	25	25	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	86	10	296	3	0	0	90	1015	0
5	1	25	25	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	295.6	3	0	0	93	1014	3
5	1	26	26	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	96	10	295.5	3	0	0	93	1013	3
5	1	26	26	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	95	10	295.2	3	0	0	93	1013	0
5	1	26	26	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	91	10	294.9	3	0	0	100	1013	3
5	1	26	26	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	294.8	3	0	0	97	1013	3
5	1	26	26	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	100	10	294.5	3	0	0	95	1013	99
5	1	26	26	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	112	10	294.6	3	0	0	93	1014	3
5	1	26	26	7	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	77	10	297.9	3	0	0	85	1014	3
5	1	26	26	8	50.6	0.257	0.658	0.005	203	300	-30.5	0.655	0.64	0.33	1.4	66	10	300.4	3	0	0	77	1015	0
5	1	26	26	9	107.2	0.37	1.089	0.005	436	517	-42.6	0.655	0.64	0.22	2.1	79	10	301.9	3	0	0	999	1016	0
5	1	26	26	10	113.2	0.316	1.361	0.005	809	410	-25.3	0.37	0.38	0.2	2.1	89	10	303.5	3	0	0	999	1016	0
5	1	26	26	11	158.2	0.383	1.666	0.006	1060	545	-32.2	0.655	0.64	0.18	2.1	85	10	303.6	3	0	0	999	1016	6
5	1	26	26	12	128	-9	-9	-9	1239	-999	-99999	0.542	0.56	0.17	99.8	999	10	999	3	0	-9	999	1013	99
5	1	26	26	13	97.9	0.323	1.553	0.011	1385	422	-31.1	0.37	0.38	0.19	2.2	92	10	303.8	3	0	0	999	1014	8
5	1	26	26	14	97.7	0.323	1.571	0.011	1435	422	-31.2	0.37	0.38	0.19	2.2	95	10	303.8	3	0	0	52	1013	7
5	1	26	26	15	58.4	0.321	1.332	0.011	1464	418	-51	0.37	0.38	0.19	2.3	97	10	302.9	3	0	0	999	1013	9
5	1	26	26	16	48.8	0.306	1.258	0.011	1474	389	-52.9	0.37	0.38	0.2	2.2	93	10	303	3	0	0	999	1013	9
5	1	26	26	17	8.1	0.222	0.692	0.011	1475	243	-121.9	0.37	0.38	0.25	1.7	89	10	301.1	3	0	0	999	1013	10
5	1	26	26	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.45	1.2	95	10	299.2	3	0	0	999	1014	99
5	1	26	26	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	96	10	297.9	3	0	0	999	1014	99
5	1	26	26	20	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	81	10	297.4	3	0	0	82	1015	3
5	1	26	26	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	77	10	296.9	3	0	0	999	1015	3
5	1	26	26	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	97	10	296.6	3	0	0	999	1015	99
5	1	26	26	23	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	136	10	296.4	3	0	0	999	1015	99
5	1	26	26	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	112	10	296	3	0	0	999	1014	99
5	1	27	27	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	102	10	296	3	0	0	999	1014	99
5	1	27	27	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	116	10	295.6	3	0	0	87	1013	3
5	1	27	27	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	106	10	295.5	3	0	0	92	1013	3
5	1	27	27	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	109	10	295.5	3	0	0	97	1013	3
5	1	27	27	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	96	10	295.4	3	0	0	87	1013	0
5	1	27	27	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	295.9	3	0	0	93	1014	3
5	1	27	27	7	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	88	10	298.4	3	0	0	93	1014	3
5	1	27	27	8	47.8	0.256	0.993	0.005	742	298	-31.7	0.655	0.64	0.33	1.4	79	10	300.5	3	0	0	77	1015	0
5	1	27	27	9	97.2	0.327	1.36	0.005	938	431	-32.7	0.655	0.64	0.22	1.8	65	10	302.4	3	0	0	63	1016	0
5	1	27	27	10	118.5	0.412	1.521	0.005	1078	608	-53.5	0.655	0.64	0.19	2.4	75	10	302.5	3	0	0	59	1016	6
5	1	27	27	11	102.3	0.357	1.498	0.006	1191	492	-40.3	0.37	0.38	0.19	2.5	99	10	303.2	3	0	0	55	1016	7
5	1	27	27	12	64.5	0.355	1.309	0.007	1260	487	-63	0.37	0.38	0.19	2.6	112	10	301.9	3	0	0	55	1015	9
5	1	27	27	13	53.1	0.34	1.246	0.008	1318	456	-66.9	0.37	0.38	0.19	2.5	103	10	301.6	3	0	0	59	1014	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	27	27	14	58.4	0.321	1.307	0.01	1384	418	-51	0.37	0.38	0.19	2.3	103	10	302.4	3	0	0	59	1013	9
5	1	27	27	15	34.3	0.287	1.105	0.01	1421	355	-62.4	0.37	0.38	0.19	2.1	97	10	301.9	3	0	0	59	1013	10
5	1	27	27	16	21.3	0.268	0.947	0.011	1443	319	-81.7	0.37	0.38	0.2	2	95	10	301.5	3	0	0	59	1013	10
5	1	27	27	17	3.3	0.237	0.51	0.011	1444	266	-363.8	0.37	0.38	0.25	1.9	92	10	300.6	3	0	0	65	1013	10
5	1	27	27	18	0.1	0.158	0.159	0.011	1442	146	-3578.7	0.37	0.38	0.45	1.3	88	10	299.4	3	0	0	72	1013	7
5	1	27	27	19	-2.1	0.055	-9	-9	-999	37	7.1	0.37	0.38	1	0.9	94	10	298.4	3	0	0	999	1014	7
5	1	27	27	20	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	87	10	297.6	3	0	0	999	1014	99
5	1	27	27	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	77	10	297.2	3	0	0	999	1015	99
5	1	27	27	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	62	10	296.8	3	0	0	999	1015	99
5	1	27	27	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	68	10	296.1	3	0	0	999	1014	99
5	1	27	27	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	103	10	295.9	3	0	0	999	1014	99
5	1	28	28	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	100	10	295.9	3	0	0	999	1014	99
5	1	28	28	2	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	87	10	295.9	3	0	0	999	1013	99
5	1	28	28	3	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	75	10	295.4	3	0	0	999	1013	99
5	1	28	28	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	62	10	295	3	0	0	999	1012	99
5	1	28	28	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.5	93	10	294.8	3	0	0	999	1013	99
5	1	28	28	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	100	10	295.2	3	0	0	999	1013	99
5	1	28	28	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	95	10	298	3	0	0	999	1014	99
5	1	28	28	8	49.4	0.283	0.666	0.005	216	345	-41.3	0.655	0.64	0.33	1.6	84	10	300.5	3	0	0	74	1015	0
5	1	28	28	9	74.5	0.327	0.94	0.005	403	429	-42.4	0.37	0.38	0.22	2.3	86	10	302	3	0	0	999	1015	0
5	1	28	28	10	139.7	0.378	1.429	0.005	756	535	-35.1	0.655	0.64	0.19	2.1	85	10	303.4	3	0	0	999	1015	0
5	1	28	28	11	116.2	0.317	1.447	0.006	945	412	-24.8	0.37	0.38	0.19	2.1	93	10	303.9	3	0	0	999	1014	4
5	1	28	28	12	164.6	0.359	1.737	0.009	1151	494	-25.3	0.655	0.64	0.18	1.9	84	10	304.5	3	0	0	999	1013	7
5	1	28	28	13	112	0.272	1.548	0.008	1196	330	-16.3	0.37	0.38	0.19	1.7	97	10	304.6	3	0	0	55	1012	7
5	1	28	28	14	80.5	0.253	1.399	0.007	1227	292	-18.1	0.37	0.38	0.19	1.6	105	10	304.4	3	0	0	54	1011	8
5	1	28	28	15	22.5	0.161	0.916	0.007	1234	151	-16.8	0.655	0.64	0.18	0.8	75	10	302.1	3	0	0	63	1010	10
5	1	28	28	16	15.3	0.252	0.807	0.007	1240	291	-94.4	0.37	0.38	0.2	1.9	89	10	301.9	3	0	0	63	1010	10
5	1	28	28	17	1.6	0.239	0.384	0.007	1239	269	-750.3	0.655	0.64	0.24	1.6	82	10	300.9	3	0	0	59	1011	10
5	1	28	28	18	0.1	0.177	0.151	0.007	1238	172	-4965.1	0.655	0.64	0.44	1.2	78	10	299.8	3	0	0	67	1011	7
5	1	28	28	19	-4.1	0.081	-9	-9	-999	57	11.6	0.655	0.64	1	1.1	67	10	299.1	3	0	0	72	1012	7
5	1	28	28	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	66	10	298.6	3	0	0	77	1013	7
5	1	28	28	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	297.9	3	0	0	79	1013	7
5	1	28	28	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	55	10	296.9	3	0	0	82	1013	99
5	1	28	28	23	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	63	10	296.4	3	0	0	85	1013	3
5	1	28	28	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	296.2	3	0	0	87	1013	3
5	1	29	29	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	61	10	295.8	3	0	0	90	1012	99
5	1	29	29	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	295.6	3	0	0	93	1011	3
5	1	29	29	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	54	10	295.5	3	0	0	999	1010	3
5	1	29	29	4	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	80	10	295.1	3	0	0	999	1011	99
5	1	29	29	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	76	10	295.5	3	0	0	999	1011	99
5	1	29	29	6	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	40	10	295.4	3	0	0	999	1012	99
5	1	29	29	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	66	10	297.9	3	0	0	999	1012	99
5	1	29	29	8	52.6	0.245	0.728	0.005	265	280	-25.4	0.655	0.64	0.33	1.3	75	10	301	3	0	0	77	1013	0
5	1	29	29	9	102.3	0.342	1.136	0.005	518	460	-35.4	0.655	0.64	0.22	1.9	77	10	302.1	3	0	0	69	1014	0
5	1	29	29	10	148.9	0.302	1.483	0.005	793	383	-16.7	0.655	0.64	0.19	1.5	73	10	303.8	3	0	0	61	1014	0
5	1	29	29	11	102.6	0.237	1.385	0.005	937	266	-11.7	0.37	0.38	0.19	1.4	92	10	303.9	3	0	0	53	1013	7
5	1	29	29	12	93.5	0.247	1.403	0.005	1067	283	-14.6	0.655	0.64	0.18	1.2	0	10	303	3	0	0	53	1012	9
5	1	29	29	13	75	0.307	1.345	0.005	1170	391	-34.7	0.655	0.64	0.18	1.7	343	10	302	3	0	0	53	1011	10
5	1	29	29	14	51.5	0.218	1.211	0.005	1243	237	-18.1	0.655	0.64	0.18	1.1	351	10	302.2	3	0	0	53	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	29	29	15	30.7	0.176	1.032	0.005	1287	171	-16.1	0.37	0.38	0.19	1.1	109	10	302.4	3	0	0	56	1010	10
5	1	29	29	16	12.7	0.173	0.772	0.005	1302	166	-36.8	0.37	0.38	0.2	1.2	92	10	301.6	3	0	0	59	1010	10
5	1	29	29	17	1.2	0.181	0.349	0.005	1299	177	-454.3	0.655	0.64	0.24	1.2	36	10	300	3	0	0	63	1010	10
5	1	29	29	18	0.1	0.133	0.153	0.005	1295	112	-2114.5	0.655	0.64	0.44	0.9	47	10	298.8	3	0	0	67	1010	7
5	1	29	29	19	-0.4	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	61	10	297.8	3	0	0	71	1010	99
5	1	29	29	20	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	92	10	297	3	0	0	76	1011	7
5	1	29	29	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	296.4	3	0	0	90	1011	3
5	1	29	29	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	296	3	0	0	84	1012	3
5	1	29	29	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	296	3	0	0	87	1011	3
5	1	29	29	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	295.8	3	0	0	90	1011	3
5	1	30	30	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	295.8	3	0	0	93	1010	3
5	1	30	30	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	295.4	3	0	0	93	1010	3
5	1	30	30	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	89	10	295.1	3	0	0	93	1010	3
5	1	30	30	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	99	10	295.6	3	0	0	97	1010	3
5	1	30	30	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	295.8	3	0	0	97	1010	7
5	1	30	30	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	296.1	3	0	0	97	1010	3
5	1	30	30	7	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	298.8	3	0	0	100	1011	3
5	1	30	30	8	51	0.205	-9	-9	-999	213	-15.2	0.655	0.64	0.33	1	62	10	300.8	3	0	0	85	1012	0
5	1	30	30	9	110.9	0.292	-9	-9	-999	363	-20.3	0.655	0.64	0.22	1.5	53	10	302.1	3	0	0	67	1013	0
5	1	30	30	10	147	0.274	-9	-9	-999	330	-12.7	0.655	0.64	0.19	1.3	49	10	303.5	3	0	0	55	1013	0
5	1	30	30	11	152.9	0.29	-9	-9	-999	359	-14.3	0.655	0.64	0.18	1.4	39	10	303.9	3	0	0	55	1012	6
5	1	30	30	12	152	0.248	-9	-9	-999	284	-9	0.655	0.64	0.18	1.1	68	10	304.4	3	0	0	52	1011	7
5	1	30	30	13	137.5	0.258	-9	-9	-999	302	-11.3	0.655	0.64	0.18	1.2	20	10	304.2	3	0	0	49	1010	8
5	1	30	30	14	104.3	0.356	-9	-9	-999	488	-38.9	0.655	0.64	0.18	2	359	10	303.1	3	0	0	47	1009	9
5	1	30	30	15	99	0.276	-9	-9	-999	335	-19	0.655	0.64	0.18	1.4	27	10	304.2	3	0	0	45	1009	8
5	1	30	30	16	47.6	0.243	-9	-9	-999	276	-27.1	0.655	0.64	0.19	1.3	59	10	303.5	3	0	0	48	1009	9
5	1	30	30	17	15.6	0.207	-9	-9	-999	217	-51.3	0.655	0.64	0.24	1.2	76	10	302	3	0	0	52	1009	10
5	1	30	30	18	0.1	0.162	-9	-9	-999	150	-3826.9	0.655	0.64	0.44	1.1	70	10	299.6	3	0	0	60	1009	7
5	1	30	30	19	-4.1	0.081	-9	-9	-999	55	11.6	0.655	0.64	1	1.1	65	10	298.2	3	0	0	69	1010	7
5	1	30	30	20	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	77	10	297.1	3	0	0	79	1010	7
5	1	30	30	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	296.4	3	0	0	84	1011	7
5	1	30	30	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	295.8	3	0	0	90	1011	7
5	1	30	30	23	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	82	10	295.6	3	0	0	90	1011	7
5	1	30	30	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	295.1	3	0	0	87	1011	7
5	1	31	31	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	294.9	3	0	0	87	1010	7
5	1	31	31	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	294.6	3	0	0	93	1010	3
5	1	31	31	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	294.8	3	0	0	93	1010	3
5	1	31	31	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	92	10	294.4	3	0	0	96	1010	3
5	1	31	31	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	294	3	0	0	100	1010	7
5	1	31	31	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	294.2	3	0	0	100	1011	7
5	1	31	31	7	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	297.6	3	0	0	91	1012	7
5	1	31	31	8	50.9	0.191	0.659	0.005	203	192	-12.3	0.655	0.64	0.33	0.9	84	10	300.4	3	0	0	82	1013	0
5	1	31	31	9	103.9	0.264	1.225	0.005	640	312	-16	0.655	0.64	0.22	1.3	63	10	301.8	3	0	0	72	1013	0
5	1	31	31	10	123.7	0.269	1.476	0.006	941	321	-14.3	0.655	0.64	0.19	1.3	6	10	302.2	3	0	0	51	1013	6
5	1	31	31	11	164.8	0.332	1.697	0.005	1073	440	-20	0.655	0.64	0.18	1.7	341	10	302.6	3	0	0	47	1012	5
5	1	31	31	12	188.9	0.403	1.817	0.005	1147	588	-31.3	0.655	0.64	0.18	2.2	336	10	303.1	3	0	0	40	1012	4
5	1	31	31	13	176.5	0.439	1.839	0.006	1272	669	-43.2	0.655	0.64	0.18	2.5	344	10	303.2	3	0	0	37	1010	6
5	1	31	31	14	151.1	0.434	1.794	0.007	1379	658	-48.7	0.655	0.64	0.18	2.5	344	10	303.1	3	0	0	41	1010	7
5	1	31	31	15	114.4	0.411	1.667	0.007	1460	607	-54.7	0.655	0.64	0.18	2.4	345	10	302.9	3	0	0	41	1009	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	1	31	31	16	66.4	0.381	1.415	0.008	1539	542	-75.2	0.655	0.64	0.19	2.3	347	10	302.4	3	0	0	42	1009	9
5	1	31	31	17	15	0.285	0.863	0.008	1541	355	-139.5	0.655	0.64	0.24	1.8	357	10	300.9	3	0	0	50	1009	10
5	1	31	31	18	0.1	0.177	0.163	0.008	1540	176	-4958.4	0.655	0.64	0.43	1.2	17	10	299.2	3	0	0	59	1010	3
5	1	31	31	19	-2.4	0.059	-9	-9	-999	46	7.5	0.655	0.64	1	0.8	48	10	297.6	3	0	0	65	1010	3
5	1	31	31	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	60	10	296.8	3	0	0	71	1011	0
5	1	31	31	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	76	10	296.2	3	0	0	79	1012	3
5	1	31	31	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	59	10	295.4	3	0	0	87	1012	3
5	1	31	31	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	83	10	295.1	3	0	0	93	1012	0
5	1	31	31	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	295.2	3	0	0	93	1012	3
5	2	1	32	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	98	10	294.9	3	0	0	93	1011	3
5	2	1	32	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	82	10	294.4	3	0	0	93	1010	0
5	2	1	32	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	294	3	0	0	93	1010	3
5	2	1	32	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	71	10	293.9	3	0	0	93	1010	3
5	2	1	32	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	92	10	293.4	3	0	0	97	1010	0
5	2	1	32	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	103	10	293.8	3	0	0	100	1011	3
5	2	1	32	7	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	98	10	298.1	3	0	0	87	1012	3
5	2	1	32	8	48.9	0.141	0.837	0.005	433	122	-5.2	0.562	0.7	0.33	0.6	68	10	300.6	3	0	0	84	1013	0
5	2	1	32	9	131	0.233	1.453	0.005	847	258	-8.7	0.562	0.7	0.22	1.1	69	10	302.4	3	0	0	75	1013	0
5	2	1	32	10	129.9	0.219	1.52	0.005	978	235	-7.3	0.562	0.7	0.19	1	9	10	302.4	3	0	0	67	1013	6
5	2	1	32	11	80	0.258	1.328	0.005	1058	301	-19.3	0.562	0.7	0.18	1.4	340	10	301.8	3	0	0	59	1012	9
5	2	1	32	12	171.6	0.345	1.802	0.005	1233	465	-21.5	0.562	0.7	0.18	1.9	341	10	302.8	3	0	0	54	1012	7
5	2	1	32	13	160.3	0.367	1.837	0.009	1396	511	-27.8	0.562	0.7	0.18	2.1	340	10	302.8	3	0	0	49	1010	7
5	2	1	32	14	150.7	0.365	1.882	0.013	1595	507	-29	0.562	0.7	0.18	2.1	336	10	302.8	3	0	0	44	1009	7
5	2	1	32	15	124	0.358	1.778	0.013	1634	492	-33.2	0.562	0.7	0.18	2.1	347	10	303.2	3	0	0	55	1009	8
5	2	1	32	16	56.7	0.286	1.375	0.013	1651	354	-37.1	0.562	0.7	0.19	1.7	356	10	302.4	3	0	0	45	1009	9
5	2	1	32	17	4.3	0.13	0.585	0.013	1651	125	-45.5	0.212	0.48	0.24	1.1	97	10	301.4	3	0	0	53	1009	10
5	2	1	32	18	0.1	0.181	0.166	0.013	1649	177	-5350.7	0.562	0.7	0.43	1.3	62	10	299.8	3	0	0	59	1010	3
5	2	1	32	19	-5.1	0.083	-9	-9	-999	60	10.3	0.562	0.7	1	1.2	62	10	298.2	3	0	0	69	1010	3
5	2	1	32	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	297.1	3	0	0	69	1011	3
5	2	1	32	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	296.2	3	0	0	84	1011	3
5	2	1	32	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	295.9	3	0	0	85	1012	3
5	2	1	32	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	295.8	3	0	0	87	1012	3
5	2	1	32	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	295.4	3	0	0	89	1011	3
5	2	2	33	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.6	109	10	295	3	0	0	91	1011	99
5	2	2	33	2	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	66	10	294.5	3	0	0	93	1010	0
5	2	2	33	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	64	10	294	3	0	0	93	1010	3
5	2	2	33	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	99	10	293.8	3	0	0	95	1010	3
5	2	2	33	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	110	10	293.4	3	0	0	97	1010	3
5	2	2	33	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	107	10	293.8	3	0	0	93	1011	3
5	2	2	33	7	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	297.9	3	0	0	93	1012	3
5	2	2	33	8	56.9	0.144	0.665	0.007	187	125	-4.7	0.562	0.7	0.33	0.6	64	10	301	3	0	0	84	1012	0
5	2	2	33	9	118.5	0.23	1.102	0.005	408	254	-9.3	0.562	0.7	0.22	1.1	71	10	302.4	3	0	0	999	1013	0
5	2	2	33	10	163.4	0.225	1.429	0.005	646	245	-6.3	0.562	0.7	0.19	1	360	10	303.2	3	0	0	999	1013	0
5	2	2	33	11	186.2	0.27	1.683	0.005	925	323	-9.6	0.562	0.7	0.18	1.3	345	10	303.6	3	0	0	999	1012	0
5	2	2	33	12	141	-9	-9	-9	1082	-999	-99999	0.475	0.6	0.17	0	0	10	304.4	3	0	0	45	1011	8
5	2	2	33	13	104.8	0.204	1.515	0.006	1197	211	-7.3	0.24	0.3	0.16	1.3	317	10	304.4	3	0	0	45	1010	6
5	2	2	33	14	126.3	0.358	1.671	0.007	1332	494	-32.8	0.562	0.7	0.18	2.1	336	10	302.9	3	0	0	48	1009	8
5	2	2	33	15	112.7	0.318	1.657	0.008	1456	413	-25.7	0.562	0.7	0.18	1.8	342	10	303.1	3	0	0	42	1009	8
5	2	2	33	16	57	0.249	1.336	0.008	1506	288	-24.4	0.562	0.7	0.19	1.4	354	10	302.9	3	0	0	48	1009	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	2	33	17	4.4	0.13	0.567	0.008	1506	115	-45.4	0.212	0.48	0.24	1.1	110	10	301.4	3	0	0	59	1009	10
5	2	2	33	18	0.1	0.115	0.161	0.008	1504	90	-1369.4	0.212	0.48	0.43	1.1	86	10	299.4	3	0	0	67	1010	3
5	2	2	33	19	-2.2	0.056	-9	-9	-999	31	6.9	0.562	0.7	1	0.8	73	10	298.1	3	0	0	76	1011	3
5	2	2	33	20	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	73	10	297.4	3	0	0	85	1012	3
5	2	2	33	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	64	10	296.8	3	0	0	91	1012	3
5	2	2	33	22	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	72	10	296.4	3	0	0	97	1013	3
5	2	2	33	23	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	75	10	296.1	3	0	0	93	1012	3
5	2	2	33	24	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	295.9	3	0	0	90	1012	3
5	2	3	34	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	295.8	3	0	0	93	1012	3
5	2	3	34	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	94	10	295.9	3	0	0	93	1012	0
5	2	3	34	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	296.2	3	0	0	93	1011	7
5	2	3	34	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	295.6	3	0	0	93	1011	7
5	2	3	34	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	92	10	295.2	3	0	0	93	1012	0
5	2	3	34	6	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	96	10	295.1	3	0	0	87	1012	7
5	2	3	34	7	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	99	10	296.9	3	0	0	93	1013	7
5	2	3	34	8	31.7	0.147	0.497	0.006	140	130	-9.1	0.562	0.7	0.33	0.7	57	10	299.9	3	0	0	84	1014	0
5	2	3	34	9	101.9	0.213	0.965	0.005	319	225	-8.5	0.562	0.7	0.22	1	66	10	301.9	3	0	0	74	1014	0
5	2	3	34	10	143.3	0.208	1.513	0.005	876	218	-5.7	0.562	0.7	0.19	0.9	62	10	303.2	3	0	0	55	1014	4
5	2	3	34	11	104.7	0.29	1.405	0.005	958	360	-21.1	0.562	0.7	0.18	1.6	344	10	301.9	3	0	0	55	1014	9
5	2	3	34	12	143	0.351	1.607	0.005	1051	477	-27.2	0.562	0.7	0.18	2	339	10	302.2	3	0	0	59	1013	8
5	2	3	34	13	103.1	0.29	1.471	0.005	1116	361	-21.3	0.562	0.7	0.18	1.6	355	10	301.9	3	0	0	72	1013	9
5	2	3	34	14	20.6	0.186	0.864	0.005	1127	189	-28.2	0.212	0.48	0.18	1.5	92	10	299.9	3	0	0	74	1012	10
5	2	3	34	15	51.3	0.209	1.182	0.005	1162	219	-16	0.562	0.7	0.18	1.1	85	10	301	3	0	0	74	1011	10
5	2	3	34	16	20.4	0.202	0.873	0.005	1174	209	-36.5	0.562	0.7	0.19	1.2	82	10	300.5	3	0	0	55	1011	10
5	2	3	34	17	3.7	0.11	0.495	0.005	1176	87	-32.4	0.212	0.48	0.24	0.9	98	10	299.9	3	0	0	59	1011	10
5	2	3	34	18	0.1	0.074	0.148	0.005	1174	47	-372.2	0.212	0.48	0.43	0.7	100	10	298.9	3	0	0	69	1012	7
5	2	3	34	19	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	297.9	3	0	0	69	1013	7
5	2	3	34	20	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	78	10	297.4	3	0	0	85	1013	7
5	2	3	34	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	108	10	296.9	3	0	0	84	1013	7
5	2	3	34	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	296.4	3	0	0	84	1014	7
5	2	3	34	23	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	79	10	295.9	3	0	0	84	1014	7
5	2	3	34	24	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	65	10	295.4	3	0	0	87	1013	3
5	2	4	35	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	295	3	0	0	90	1013	3
5	2	4	35	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	71	10	295	3	0	0	93	1013	0
5	2	4	35	3	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	98	10	294.6	3	0	0	93	1013	99
5	2	4	35	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	91	10	294.6	3	0	0	93	1013	3
5	2	4	35	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	294.8	3	0	0	93	1013	3
5	2	4	35	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	109	10	294.9	3	0	0	93	1014	7
5	2	4	35	7	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	297.9	3	0	0	93	1014	7
5	2	4	35	8	52.2	0.196	0.92	0.005	540	200	-13.1	0.562	0.7	0.33	1	76	10	300.5	3	0	0	84	1015	0
5	2	4	35	9	91.8	0.164	1.301	0.006	870	153	-4.4	0.212	0.48	0.22	1	106	10	302.4	3	0	0	72	1016	0
5	2	4	35	10	135.1	-9	-9	-9	972	-999	-99999	0.475	0.6	0.18	0	0	10	304.4	3	0	0	61	1016	0
5	2	4	35	11	158.2	0.316	1.682	0.006	1090	409	-18.1	0.562	0.7	0.18	1.7	339	10	303	3	0	0	50	1015	7
5	2	4	35	12	156.5	0.341	1.725	0.006	1189	458	-23	0.562	0.7	0.18	1.9	343	10	302.8	3	0	0	48	1014	7
5	2	4	35	13	150.7	0.377	1.741	0.006	1268	531	-32	0.562	0.7	0.18	2.2	343	10	302.4	3	0	0	46	1013	8
5	2	4	35	14	47.9	0.282	1.196	0.006	1292	348	-42.1	0.562	0.7	0.18	1.7	350	10	301.4	3	0	0	44	1013	10
5	2	4	35	15	13.5	0.17	0.786	0.006	1299	167	-33.1	0.562	0.7	0.18	1	360	10	300.9	3	0	0	47	1012	10
5	2	4	35	16	13.4	0.146	0.785	0.006	1306	128	-20.8	0.562	0.7	0.19	0.8	51	10	301.1	3	0	0	51	1012	10
5	2	4	35	17	0.1	0.153	0.154	0.006	1304	138	-3266.2	0.562	0.7	0.24	1.1	43	10	299.8	3	0	0	55	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	4	35	18	0.1	0.112	0.154	0.006	1303	87	-1279.8	0.562	0.7	0.42	0.8	54	10	299.2	3	0	0	59	1014	7
5	2	4	35	19	-1.2	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	60	10	298.9	3	0	0	64	1014	99
5	2	4	35	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	65	10	298.4	3	0	0	69	1015	7
5	2	4	35	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	66	10	297.6	3	0	0	74	1015	7
5	2	4	35	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	68	10	297.5	3	0	0	74	1015	7
5	2	4	35	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	297.2	3	0	0	84	1015	7
5	2	4	35	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	296.8	3	0	0	84	1015	7
5	2	5	36	1	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	91	10	296.8	3	0	0	90	1014	0
5	2	5	36	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	296.6	3	0	0	87	1013	7
5	2	5	36	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	296.1	3	0	0	90	1013	7
5	2	5	36	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	92	10	295.9	3	0	0	90	1013	7
5	2	5	36	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.8	3	0	0	90	1014	7
5	2	5	36	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	97	10	296.4	3	0	0	90	1014	7
5	2	5	36	7	10.8	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	105	10	297.6	3	0	0	90	1014	99
5	2	5	36	8	22.6	0.159	0.423	0.005	121	146	-16.2	0.212	0.48	0.33	1.2	97	10	299.9	3	0	0	90	1015	0
5	2	5	36	9	69	0.227	0.747	0.005	219	249	-15.4	0.212	0.48	0.22	1.7	102	10	302.2	3	0	0	74	1015	0
5	2	5	36	10	108.5	0.275	1.346	0.008	815	332	-17.4	0.212	0.48	0.19	2.1	105	10	303.4	3	0	0	59	1015	5
5	2	5	36	11	80.2	0.249	1.228	0.008	835	286	-17.4	0.212	0.48	0.18	1.9	106	10	303.6	3	0	0	59	1015	9
5	2	5	36	12	48.7	0.248	1.045	0.007	848	284	-28.3	0.212	0.48	0.18	2	109	10	302.6	3	0	0	59	1014	10
5	2	5	36	13	56.1	0.251	1.102	0.007	862	289	-25.4	0.212	0.48	0.18	2	123	10	302.5	3	0	0	67	1013	10
5	2	5	36	14	48.7	0.238	1.057	0.006	875	268	-25.1	0.212	0.48	0.18	1.9	125	10	302.8	3	0	0	65	1012	10
5	2	5	36	15	22	0.262	0.812	0.006	879	308	-73.9	0.212	0.48	0.18	2.3	135	10	299.8	3	0	2.03	70	1013	10
5	2	5	36	16	19.3	0.157	0.779	0.006	883	147	-18	0.212	0.48	0.19	1.2	117	10	297.6	3	0	0.76	78	1012	10
5	2	5	36	17	12.7	0.182	0.679	0.006	887	179	-42.7	0.562	0.7	0.24	1.1	85	10	298.4	3	0	0	86	1012	10
5	2	5	36	18	0.1	0.084	0.135	0.006	886	61	-544.4	0.212	0.48	0.42	0.8	101	10	297.9	3	0	0	94	1013	7
5	2	5	36	19	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	58	10	297.9	3	0	0	999	1013	7
5	2	5	36	20	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	56	10	297.9	3	0	0	999	1014	99
5	2	5	36	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	100	10	297.9	3	0	0	999	1014	99
5	2	5	36	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	94	10	298	3	0	0	999	1014	99
5	2	5	36	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	297.9	3	0	0	94	1014	7
5	2	5	36	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	297.6	3	0	0	93	1014	7
5	2	6	37	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	94	10	297.6	3	0	0	92	1013	99
5	2	6	37	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	297.9	3	0	0	91	1012	7
5	2	6	37	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	297.6	3	0	0	999	1012	7
5	2	6	37	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	120	10	297.9	3	0	0	999	1012	99
5	2	6	37	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	108	10	297.9	3	0	0	999	1012	99
5	2	6	37	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	113	10	297.6	3	0	0	999	1012	99
5	2	6	37	7	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	99	10	300	3	0	0	999	1012	99
5	2	6	37	8	38.1	0.177	0.606	0.005	211	172	-13.2	0.212	0.48	0.33	1.3	108	10	301.9	3	0	0	88	1013	0
5	2	6	37	9	86.5	0.242	1.062	0.005	500	273	-14.8	0.212	0.48	0.22	1.8	121	10	303	3	0	0	75	1014	0
5	2	6	37	10	110.2	0.267	1.358	0.006	823	317	-15.6	0.212	0.48	0.19	2	121	10	303.8	3	0	0	61	1014	5
5	2	6	37	11	110.2	0.257	1.43	0.006	961	300	-14	0.212	0.48	0.18	1.9	117	10	304.1	3	0	0	57	1013	8
5	2	6	37	12	107.4	0.257	1.456	0.005	1038	299	-14.2	0.212	0.48	0.18	1.9	108	10	304	3	0	0	59	1012	8
5	2	6	37	13	110.4	0.276	1.506	0.005	1118	333	-17.2	0.212	0.48	0.18	2.1	118	10	304	3	0	0	59	1012	8
5	2	6	37	14	93.8	0.291	1.455	0.006	1186	360	-23.6	0.212	0.48	0.18	2.3	125	10	303.9	3	0	0	56	1011	8
5	2	6	37	15	81.5	0.259	1.404	0.006	1224	304	-19.2	0.212	0.48	0.18	2	109	10	303.8	3	0	0	59	1010	8
5	2	6	37	16	54.1	0.25	1.23	0.006	1242	288	-26	0.212	0.48	0.19	2	110	10	303.8	3	0	0	59	1010	9
5	2	6	37	17	7.4	0.182	0.634	0.006	1243	180	-74	0.212	0.48	0.24	1.6	114	10	301.9	3	0	0	61	1010	10
5	2	6	37	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.42	1.2	100	10	300	3	0	0	999	1010	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	6	37	19	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	76	10	299.2	3	0	0	999	1011	99
5	2	6	37	20	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	63	10	298.6	3	0	0	999	1012	99
5	2	6	37	21	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	71	10	298.2	3	0	0	999	1013	99
5	2	6	37	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	97	10	297.9	3	0	0	999	1013	99
5	2	6	37	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	103	10	297.9	3	0	0	999	1013	99
5	2	6	37	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	71	10	297.9	3	0	0	999	1012	99
5	2	7	38	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	94	10	297.5	3	0	0	999	1011	99
5	2	7	38	2	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	113	10	297	3	0	0	999	1010	99
5	2	7	38	3	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.3	118	10	297.4	3	0	0	999	1009	99
5	2	7	38	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	112	10	297.6	3	0	0	999	1009	99
5	2	7	38	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	109	10	297.8	3	0	0	999	1010	99
5	2	7	38	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	102	10	297.8	3	0	0	999	1010	99
5	2	7	38	7	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	62	10	299.1	3	0	0	999	1011	99
5	2	7	38	8	36.7	0.177	-9	-9	-999	171	-13.6	0.212	0.48	0.33	1.3	106	10	301.4	3	0	0	999	1012	0
5	2	7	38	9	70.8	0.237	-9	-9	-999	266	-17	0.212	0.48	0.22	1.8	112	10	302.9	3	0	0	999	1012	0
5	2	7	38	10	115.8	0.259	-9	-9	-999	302	-13.5	0.212	0.48	0.19	1.9	128	10	304	3	0	0	999	1012	0
5	2	7	38	11	114.8	0.249	-9	-9	-999	286	-12.1	0.212	0.48	0.18	1.8	123	10	304.5	3	0	0	999	1011	7
5	2	7	38	12	95.8	0.254	-9	-9	-999	294	-15.4	0.212	0.48	0.18	1.9	124	10	304.5	3	0	0	999	1011	9
5	2	7	38	13	131.8	0.272	-9	-9	-999	326	-13.7	0.212	0.48	0.18	2	132	10	305.2	3	0	0	999	1010	7
5	2	7	38	14	96	0.272	-9	-9	-999	327	-19	0.212	0.48	0.18	2.1	129	10	304.9	3	0	0	999	1009	9
5	2	7	38	15	88	0.27	-9	-9	-999	323	-20.2	0.212	0.48	0.18	2.1	119	10	304.8	3	0	0	999	1008	8
5	2	7	38	16	48.4	0.267	-9	-9	-999	317	-35.2	0.212	0.48	0.19	2.2	123	10	303.9	3	0	0	999	1008	9
5	2	7	38	17	10.2	0.195	-9	-9	-999	200	-65.6	0.212	0.48	0.24	1.7	110	10	302	3	0	0	999	1008	10
5	2	7	38	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.42	1.3	112	10	300.2	3	0	0	999	1009	99
5	2	7	38	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	109	10	299.1	3	0	0	999	1009	99
5	2	7	38	20	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	106	10	298.8	3	0	0	999	1010	99
5	2	7	38	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	105	10	298.4	3	0	0	999	1010	99
5	2	7	38	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	113	10	298.2	3	0	0	999	1010	99
5	2	7	38	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	47	10	298	3	0	0	999	1010	99
5	2	7	38	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	43	10	297.4	3	0	0	999	1010	99
5	2	8	39	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	70	10	297	3	0	0	999	1010	99
5	2	8	39	2	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	109	10	296.9	3	0	0	999	1009	99
5	2	8	39	3	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	98	10	296.9	3	0	0	999	1009	99
5	2	8	39	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	97	10	297	3	0	0	999	1009	99
5	2	8	39	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	77	10	296.9	3	0	0	999	1010	99
5	2	8	39	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	79	10	296.8	3	0	0	999	1010	99
5	2	8	39	7	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	104	10	299.4	3	0	0	999	1010	99
5	2	8	39	8	39.5	0.178	-9	-9	-999	173	-12.9	0.212	0.48	0.33	1.3	114	10	301.9	3	0	0	999	1011	0
5	2	8	39	9	79.4	0.277	-9	-9	-999	336	-24.2	0.212	0.48	0.22	2.2	133	10	302.9	3	0	0	999	1012	0
5	2	8	39	10	112.8	0.286	-9	-9	-999	352	-18.7	0.212	0.48	0.19	2.2	138	10	303.9	3	0	0	999	1012	0
5	2	8	39	11	125.3	0.27	-9	-9	-999	323	-14.2	0.212	0.48	0.18	2	137	10	304.8	3	0	0	999	1012	7
5	2	8	39	12	192.9	0.356	-9	-9	-999	488	-21.1	0.687	0.8	0.18	1.8	144	10	305.5	3	0	0	999	1011	7
5	2	8	39	13	160.4	0.349	-9	-9	-999	475	-23.9	0.687	0.8	0.18	1.8	154	10	305.5	3	0	0	999	1010	8
5	2	8	39	14	99	0.264	-9	-9	-999	315	-16.7	0.212	0.48	0.18	2	139	10	305.2	3	0	0	999	1009	8
5	2	8	39	15	97.4	0.264	-9	-9	-999	311	-16.9	0.212	0.48	0.18	2	132	10	305.6	3	0	0	999	1008	8
5	2	8	39	16	48.8	0.239	-9	-9	-999	268	-25	0.212	0.48	0.19	1.9	121	10	304.9	3	0	0	999	1008	9
5	2	8	39	17	11.8	0.216	-9	-9	-999	231	-76.8	0.212	0.48	0.24	1.9	114	10	302.4	3	0	0	999	1009	10
5	2	8	39	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.42	1.4	105	10	300.4	3	0	0	999	1009	99
5	2	8	39	19	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1.1	85	10	299.4	3	0	0	999	1009	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	8	39	20	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1.1	80	10	298.8	3	0	0	999	1010	99
5	2	8	39	21	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1.2	83	10	298.4	3	0	0	999	1011	99
5	2	8	39	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	92	10	297.9	3	0	0	999	1011	99
5	2	8	39	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	110	10	297.5	3	0	0	999	1011	99
5	2	8	39	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	101	10	297.5	3	0	0	999	1011	99
5	2	9	40	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.5	64	10	297.4	3	0	0	999	1010	99
5	2	9	40	2	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	69	10	296.9	3	0	0	999	1009	99
5	2	9	40	3	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	98	10	297.4	3	0	0	999	1009	99
5	2	9	40	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	111	10	297.4	3	0	0	999	1009	99
5	2	9	40	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	90	10	297.4	3	0	0	999	1009	99
5	2	9	40	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	59	10	296.9	3	0	0	999	1010	99
5	2	9	40	7	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	66	10	299	3	0	0	999	1010	99
5	2	9	40	8	39.5	0.178	-9	-9	-999	173	-12.9	0.212	0.48	0.33	1.3	87	10	301.6	3	0	0	999	1011	0
5	2	9	40	9	64.6	0.235	-9	-9	-999	262	-18.1	0.212	0.48	0.22	1.8	106	10	302.5	3	0	0	999	1012	7
5	2	9	40	10	107.6	0.266	-9	-9	-999	316	-15.8	0.212	0.48	0.19	2	115	10	304.1	3	0	0	999	1012	6
5	2	9	40	11	129.8	0.281	-9	-9	-999	342	-15.3	0.212	0.48	0.18	2.1	125	10	305	3	0	0	999	1011	6
5	2	9	40	12	110.9	0.267	-9	-9	-999	317	-15.4	0.212	0.48	0.18	2	120	10	305.1	3	0	0	999	1010	8
5	2	9	40	13	108.1	0.266	-9	-9	-999	316	-15.7	0.212	0.48	0.18	2	124	10	305.4	3	0	0	999	1009	8
5	2	9	40	14	106.4	0.285	-9	-9	-999	349	-19.5	0.212	0.48	0.18	2.2	126	10	305.1	3	0	0	999	1008	8
5	2	9	40	15	83.7	0.279	-9	-9	-999	338	-23.2	0.212	0.48	0.18	2.2	127	10	304.9	3	0	0	999	1008	9
5	2	9	40	16	45.7	0.256	-9	-9	-999	298	-33	0.212	0.48	0.19	2.1	119	10	304.5	3	0	0	999	1008	9
5	2	9	40	17	13.3	0.217	-9	-9	-999	233	-69.5	0.212	0.48	0.24	1.9	113	10	302.6	3	0	0	999	1008	10
5	2	9	40	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.41	1.4	109	10	300.5	3	0	0	999	1008	99
5	2	9	40	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	100	10	299.5	3	0	0	999	1009	99
5	2	9	40	20	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	88	10	298.9	3	0	0	999	1010	99
5	2	9	40	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	96	10	298.5	3	0	0	999	1011	99
5	2	9	40	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	96	10	298	3	0	0	999	1012	99
5	2	9	40	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	86	10	297.9	3	0	0	999	1012	99
5	2	9	40	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	63	10	297.5	3	0	0	999	1011	99
5	2	10	41	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	70	10	297.2	3	0	0	999	1010	99
5	2	10	41	2	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	61	10	297	3	0	0	999	1010	99
5	2	10	41	3	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	57	10	296.9	3	0	0	999	1010	99
5	2	10	41	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	77	10	297	3	0	0	999	1010	99
5	2	10	41	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	76	10	296.8	3	0	0	999	1010	99
5	2	10	41	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	70	10	296.8	3	0	0	999	1010	99
5	2	10	41	7	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	68	10	299.2	3	0	0	999	1011	99
5	2	10	41	8	42	0.179	-9	-9	-999	174	-12.4	0.212	0.48	0.33	1.3	87	10	301.6	3	0	0	999	1012	0
5	2	10	41	9	75.4	0.2	-9	-9	-999	206	-9.6	0.212	0.48	0.21	1.4	103	10	303.4	3	0	0	999	1013	0
5	2	10	41	10	112	0.238	-9	-9	-999	267	-10.9	0.212	0.48	0.19	1.7	122	10	304.4	3	0	0	999	1013	5
5	2	10	41	11	110.7	0.228	-9	-9	-999	251	-9.7	0.212	0.48	0.18	1.6	113	10	305	3	0	0	999	1012	8
5	2	10	41	12	144.1	0.245	-9	-9	-999	278	-9.2	0.212	0.48	0.18	1.7	119	10	305.9	3	0	0	999	1011	6
5	2	10	41	13	57.5	0.185	-9	-9	-999	184	-9.9	0.212	0.48	0.18	1.3	104	10	305.2	3	0	0	999	1010	10
5	2	10	41	14	35.8	0.233	-9	-9	-999	258	-31.7	0.212	0.48	0.18	1.9	101	10	303.6	3	0	0	63	1009	10
5	2	10	41	15	52	0.259	-9	-9	-999	303	-30	0.212	0.48	0.18	2.1	105	10	303.8	3	0	0	999	1009	10
5	2	10	41	16	51.2	0.249	-9	-9	-999	286	-27.2	0.212	0.48	0.19	2	111	10	303.8	3	0	0	999	1009	9
5	2	10	41	17	8.9	0.184	-9	-9	-999	183	-63	0.212	0.48	0.24	1.6	107	10	302.2	3	0	0	999	1009	10
5	2	10	41	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.41	0.9	98	10	300.5	3	0	0	999	1009	99
5	2	10	41	19	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	80	10	299.8	3	0	0	999	1010	99
5	2	10	41	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	109	10	299.1	3	0	0	85	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	10	41	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.9	3	0	0	86	1012	7
5	2	10	41	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	71	10	298.9	3	0	0	87	1012	99
5	2	10	41	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	72	10	298.2	3	0	0	88	1012	7
5	2	10	41	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	98	10	297.9	3	0	0	88	1012	7
5	2	11	42	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	90	10	297.5	3	0	0	88	1011	99
5	2	11	42	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	89	10	297.6	3	0	0	88	1010	7
5	2	11	42	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	297.5	3	0	0	90	1010	7
5	2	11	42	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	102	10	297.4	3	0	0	92	1010	99
5	2	11	42	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	85	10	297.6	3	0	0	94	1011	7
5	2	11	42	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	104	10	297.5	3	0	0	89	1012	7
5	2	11	42	7	19.9	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	73	10	299.6	3	0	0	84	1013	99
5	2	11	42	8	40.7	0.198	0.807	0.005	466	202	-17.1	0.212	0.48	0.32	1.5	91	10	301.2	3	0	0	79	1014	0
5	2	11	42	9	115.9	0.281	1.357	0.005	781	342	-17.3	0.562	0.7	0.21	1.5	83	10	303.4	3	0	0	70	1014	0
5	2	11	42	10	113.5	0.239	1.404	0.005	882	268	-10.8	0.212	0.48	0.19	1.7	91	10	304.4	3	0	0	61	1014	5
5	2	11	42	11	132.9	0.252	1.538	0.005	990	291	-10.9	0.212	0.48	0.18	1.8	102	10	305	3	0	0	57	1013	6
5	2	11	42	12	159	0.257	1.702	0.005	1120	300	-9.6	0.212	0.48	0.18	1.8	106	10	306	3	0	0	56	1012	5
5	2	11	42	13	142.9	0.225	1.698	0.005	1238	246	-7.2	0.212	0.48	0.18	1.5	99	10	306.4	3	0	0	56	1011	7
5	2	11	42	14	108.3	0.267	1.583	0.005	1322	316	-15.8	0.562	0.7	0.18	1.4	350	10	304.2	3	0	0	52	1010	9
5	2	11	42	15	37.4	0.148	1.119	0.005	1352	137	-7.8	0.212	0.48	0.18	1	98	10	304.1	3	0	0	999	1009	10
5	2	11	42	16	11.4	0.196	0.754	0.005	1358	200	-60.1	0.212	0.48	0.19	1.7	109	10	302.9	3	0	0	999	1009	10
5	2	11	42	17	1.8	0.192	0.405	0.005	1357	193	-359.9	0.212	0.48	0.24	1.8	109	10	301.8	3	0	0	999	1010	10
5	2	11	42	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.41	1.4	106	10	300.4	3	0	0	999	1010	99
5	2	11	42	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	102	10	299.4	3	0	0	999	1011	99
5	2	11	42	20	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	85	10	298.8	3	0	0	79	1012	3
5	2	11	42	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	78	10	297.9	3	0	0	999	1013	3
5	2	11	42	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	65	10	297.5	3	0	0	999	1013	99
5	2	11	42	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	59	10	297.1	3	0	0	999	1013	99
5	2	11	42	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	65	10	296.9	3	0	0	999	1013	99
5	2	12	43	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.6	114	10	296.5	3	0	0	999	1012	99
5	2	12	43	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	110	10	296.2	3	0	0	97	1012	3
5	2	12	43	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	84	10	296.1	3	0	0	999	1011	3
5	2	12	43	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	84	10	296.2	3	0	0	999	1011	99
5	2	12	43	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	86	10	296	3	0	0	999	1012	99
5	2	12	43	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	90	10	296.2	3	0	0	999	1012	99
5	2	12	43	7	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	89	10	299.4	3	0	0	999	1013	99
5	2	12	43	8	52.1	0.196	0.653	0.005	193	200	-13.2	0.562	0.7	0.32	1	76	10	301.5	3	0	0	85	1014	0
5	2	12	43	9	72.9	0.18	0.877	0.005	335	176	-7.2	0.212	0.48	0.21	1.2	86	10	302.8	3	0	0	999	1015	4
5	2	12	43	10	129.4	0.259	1.281	0.005	588	302	-12.1	0.562	0.7	0.19	1.3	64	10	304.1	3	0	0	999	1014	7
5	2	12	43	11	109	0.267	1.335	0.005	790	317	-15.7	0.562	0.7	0.18	1.4	80	10	302.5	3	0	0.25	999	1014	9
5	2	12	43	12	172.2	0.307	1.657	0.005	957	391	-15.1	0.562	0.7	0.18	1.6	79	10	303.5	3	0	0	999	1013	7
5	2	12	43	13	73.9	0.191	1.281	0.006	1028	198	-8.5	0.562	0.7	0.18	0.9	39	10	303.6	3	0	0	999	1013	10
5	2	12	43	14	44.8	0.209	1.1	0.006	1072	219	-18.3	0.212	0.48	0.18	1.6	98	10	303.8	3	0	0	47	1012	10
5	2	12	43	15	41.4	0.226	1.085	0.007	1111	247	-25.1	0.212	0.48	0.18	1.8	102	10	303.4	3	0	0	51	1012	10
5	2	12	43	16	49.7	0.22	1.169	0.007	1159	237	-19.3	0.212	0.48	0.19	1.7	115	10	303.5	3	0	0	55	1012	9
5	2	12	43	17	10.2	0.158	0.691	0.007	1165	145	-34.7	0.212	0.48	0.23	1.3	113	10	301.9	3	0	0	59	1012	10
5	2	12	43	18	0.1	0.084	0.148	0.007	1160	58	-544.2	0.212	0.48	0.41	0.8	90	10	300	3	0	0	65	1012	7
5	2	12	43	19	-0.4	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	78	10	299.1	3	0	0	72	1013	99
5	2	12	43	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	298.2	3	0	0	79	1013	7
5	2	12	43	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	297.4	3	0	0	82	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	12	43	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	75	10	297	3	0	0	86	1014	99
5	2	12	43	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	113	10	296.5	3	0	0	90	1014	7
5	2	12	43	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	296.6	3	0	0	91	1014	7
5	2	13	44	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	104	10	296.9	3	0	0	92	1013	99
5	2	13	44	2	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	90	10	297.2	3	0	0	94	1013	7
5	2	13	44	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	93	10	296.9	3	0	0	999	1012	7
5	2	13	44	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	120	10	296.9	3	0	0	999	1012	99
5	2	13	44	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.6	97	10	296.5	3	0	0	999	1013	99
5	2	13	44	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	52	10	296.9	3	0	0	999	1013	99
5	2	13	44	7	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1	75	10	299.4	3	0	0	999	1014	99
5	2	13	44	8	47.3	0.181	-9	-9	-999	177	-11.4	0.212	0.48	0.32	1.3	95	10	301.8	3	0	0	79	1015	0
5	2	13	44	9	63.3	0.253	-9	-9	-999	293	-23.2	0.212	0.48	0.21	2	88	10	302.5	3	0	0	71	1015	7
5	2	13	44	10	101.4	0.265	-9	-9	-999	313	-16.5	0.212	0.48	0.19	2	103	10	303.4	3	0	0	63	1015	6
5	2	13	44	11	144.6	0.293	-9	-9	-999	365	-15.7	0.212	0.48	0.18	2.2	118	10	304.9	3	0	0	56	1014	4
5	2	13	44	12	134.8	0.263	-9	-9	-999	310	-12.1	0.212	0.48	0.18	1.9	117	10	305.2	3	0	0	56	1013	7
5	2	13	44	13	117.2	0.249	-9	-9	-999	287	-11.9	0.212	0.48	0.18	1.8	119	10	305.6	3	0	0	56	1013	8
5	2	13	44	14	112.6	0.238	-9	-9	-999	268	-10.8	0.212	0.48	0.18	1.7	101	10	305.5	3	0	0	56	1012	8
5	2	13	44	15	100.7	0.226	-9	-9	-999	247	-10.3	0.212	0.48	0.18	1.6	97	10	306.1	3	0	0	999	1011	8
5	2	13	44	16	44.4	0.237	-9	-9	-999	265	-27	0.212	0.48	0.19	1.9	99	10	304.8	3	0	0	999	1011	9
5	2	13	44	17	14.8	0.2	-9	-9	-999	206	-48.6	0.212	0.48	0.23	1.7	103	10	302.9	3	0	0	999	1012	10
5	2	13	44	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.41	1.2	102	10	300.4	3	0	0	999	1012	99
5	2	13	44	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	91	10	299.2	3	0	0	999	1013	99
5	2	13	44	20	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	84	10	298.4	3	0	0	999	1013	99
5	2	13	44	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	98	10	297.9	3	0	0	999	1014	99
5	2	13	44	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	95	10	297.9	3	0	0	999	1014	99
5	2	13	44	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	109	10	297.9	3	0	0	999	1014	99
5	2	13	44	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	75	10	297.5	3	0	0	999	1014	99
5	2	14	45	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	104	10	297.4	3	0	0	999	1013	99
5	2	14	45	2	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	109	10	297.5	3	0	0	90	1013	7
5	2	14	45	3	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	104	10	297	3	0	1.27	92	1013	7
5	2	14	45	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	117	10	295.8	3	0	0.76	94	1013	99
5	2	14	45	5	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	142	10	296	3	0	0	97	1013	7
5	2	14	45	6	-4	0.073	-9	-9	-999	45	8.7	0.212	0.48	1	1.4	104	10	296.4	3	0	0	93	1014	7
5	2	14	45	7	11.8	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.4	99	10	297.6	3	0	0	90	1014	99
5	2	14	45	8	27.5	0.22	0.551	0.006	219	238	-35	0.562	0.7	0.32	1.3	71	10	299.2	3	0	0	87	1015	0
5	2	14	45	9	95.5	0.3	1.013	0.005	394	379	-25.7	0.562	0.7	0.21	1.7	67	10	301.4	3	0	0	82	1016	3
5	2	14	45	10	119	0.332	1.263	0.005	613	440	-27.8	0.562	0.7	0.19	1.9	78	10	302.4	3	0	0	67	1016	7
5	2	14	45	11	93.4	0.262	1.239	0.005	738	311	-17.5	0.212	0.48	0.18	2	90	10	303.2	3	0	0	57	1015	8
5	2	14	45	12	68.5	0.208	1.15	0.005	803	218	-11.8	0.212	0.48	0.18	1.5	135	10	300.4	3	0	0	67	1015	9
5	2	14	45	13	101.4	0.255	1.366	0.005	908	296	-14.8	0.212	0.48	0.18	1.9	116	10	303.9	3	0	0	64	1013	8
5	2	14	45	14	104.7	0.256	1.432	0.005	1013	298	-14.5	0.212	0.48	0.18	1.9	127	10	304.5	3	0	0	61	1013	8
5	2	14	45	15	114.6	-9	-9	-9	1127	-999	-99999	0.475	0.6	0.18	0	0	10	304.5	3	0	0	999	1012	8
5	2	14	45	16	53.5	0.184	1.204	0.005	1176	181	-10.4	0.562	0.7	0.19	0.9	335	10	302.9	3	0	0	999	1012	9
5	2	14	45	17	8.3	-9	-9	-9	1180	-999	-99999	0.475	0.6	0.23	0	0	10	301.1	3	0	0	999	1012	10
5	2	14	45	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.4	0.8	115	10	300.4	3	0	0	999	1012	99
5	2	14	45	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	97	10	299.2	3	0	0	999	1013	99
5	2	14	45	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	298.9	3	0	0	77	1013	3
5	2	14	45	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	297.9	3	0	0	79	1014	3
5	2	14	45	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.6	93	10	297.4	3	0	0	82	1014	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	14	45	23	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	69	10	297.1	3	0	0	85	1013	0
5	2	14	45	24	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	91	10	296.9	3	0	0	97	1013	3
5	2	15	46	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	67	10	296.8	3	0	0	90	1012	3
5	2	15	46	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	74	10	296.9	3	0	0	94	1012	0
5	2	15	46	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	296.5	3	0	0	97	1012	3
5	2	15	46	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	93	10	296.8	3	0	0	999	1012	3
5	2	15	46	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	89	10	296.6	3	0	0	999	1012	99
5	2	15	46	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	110	10	296.4	3	0	0	999	1013	99
5	2	15	46	7	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	112	10	297.8	3	0	0	94	1013	3
5	2	15	46	8	49.8	0.172	0.652	0.005	201	165	-9.3	0.212	0.48	0.32	1.2	90	10	301.4	3	0	0	82	1014	0
5	2	15	46	9	88.4	0.242	0.99	0.005	398	274	-14.6	0.212	0.48	0.21	1.8	91	10	302.9	3	0	0	73	1014	0
5	2	15	46	10	144.2	0.326	1.494	0.005	836	428	-21.7	0.562	0.7	0.19	1.8	81	10	303.9	3	0	0	65	1014	5
5	2	15	46	11	185.8	0.372	1.789	0.005	1115	522	-25.1	0.562	0.7	0.18	2.1	79	10	305	3	0	0	57	1013	4
5	2	15	46	12	163.1	0.297	1.783	0.005	1257	374	-14.4	0.212	0.48	0.18	2.2	91	10	305.4	3	0	0	56	1012	5
5	2	15	46	13	148.6	0.275	1.787	0.005	1386	332	-12.6	0.212	0.48	0.18	2	98	10	305.9	3	0	0	56	1011	6
5	2	15	46	14	138	0.273	1.793	0.005	1506	328	-13.3	0.212	0.48	0.18	2	100	10	305.8	3	0	0	56	1010	7
5	2	15	46	15	104.7	0.284	1.651	0.005	1551	348	-19.7	0.212	0.48	0.18	2.2	108	10	305.2	3	0	0	56	1009	8
5	2	15	46	16	60.5	0.262	1.383	0.005	1574	309	-26.8	0.212	0.48	0.19	2.1	106	10	304.6	3	0	0	52	1009	9
5	2	15	46	17	14.6	0.219	0.863	0.005	1577	235	-64.1	0.212	0.48	0.23	1.9	108	10	302.4	3	0	0	57	1009	10
5	2	15	46	18	0.1	0.146	0.164	0.005	1573	129	-2793.7	0.212	0.48	0.4	1.4	115	10	300.1	3	0	0	67	1010	3
5	2	15	46	19	-3.3	0.062	-9	-9	-999	39	6.7	0.212	0.48	1	1.2	116	10	298.9	3	0	0	74	1010	3
5	2	15	46	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	298.2	3	0	0	82	1011	3
5	2	15	46	21	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	89	10	297.9	3	0	0	82	1012	3
5	2	15	46	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	103	10	297.2	3	0	0	84	1012	3
5	2	15	46	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	296.8	3	0	0	87	1012	3
5	2	15	46	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	296.6	3	0	0	90	1011	3
5	2	16	47	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	93	10	296.1	3	0	0	93	1010	99
5	2	16	47	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	99	10	295.9	3	0	0	97	1009	0
5	2	16	47	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	104	10	295.6	3	0	0	100	1009	3
5	2	16	47	4	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	101	10	295.9	3	0	0	93	1009	3
5	2	16	47	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	96	10	295.5	3	0	0	97	1009	0
5	2	16	47	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	101	10	295.6	3	0	0	100	1010	3
5	2	16	47	7	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	0.76	0.6	89	10	299	3	0	0	93	1011	0
5	2	16	47	8	59.1	0.186	0.666	0.006	180	185	-9.8	0.562	0.7	0.32	0.9	58	10	301.9	3	0	0	79	1012	0
5	2	16	47	9	123.4	0.283	1.109	0.005	399	346	-16.5	0.562	0.7	0.21	1.5	60	10	303.1	3	0	0	63	1012	0
5	2	16	47	10	166.5	0.266	1.474	0.005	695	316	-10.2	0.562	0.7	0.19	1.3	65	10	304.4	3	0	0	55	1012	0
5	2	16	47	11	179.4	0.371	1.769	0.005	1116	520	-25.7	0.562	0.7	0.18	2.1	340	10	303.8	3	0	0	52	1012	5
5	2	16	47	12	195.1	0.374	1.917	0.005	1303	527	-24.2	0.562	0.7	0.18	2.1	342	10	303.9	3	0	0	47	1010	6
5	2	16	47	13	189.6	0.41	1.97	0.006	1454	603	-32.7	0.562	0.7	0.18	2.4	338	10	304	3	0	0	47	1009	6
5	2	16	47	14	145.9	0.4	1.82	0.006	1490	583	-39.6	0.562	0.7	0.18	2.4	336	10	303.9	3	0	0	54	1009	8
5	2	16	47	15	128.4	0.409	1.82	0.006	1693	601	-47.9	0.562	0.7	0.18	2.5	339	10	303.8	3	0	0	70	1008	8
5	2	16	47	16	1.7	0.227	0.431	0.006	1690	272	-616.7	0.562	0.7	0.19	1.6	348	10	300.2	3	0	7.87	68	1009	10
5	2	16	47	17	0.1	0.15	0.168	0.006	1689	136	-3037.9	0.687	0.8	0.23	1	179	10	298.9	3	0	0.51	67	1009	10
5	2	16	47	18	0.1	0.091	0.168	0.006	1689	64	-685.8	0.687	0.8	0.4	0.6	166	10	298.8	3	0	2.54	72	1010	3
5	2	16	47	19	-2.5	0.06	-9	-9	-999	34	7.7	0.687	0.8	1	0.8	165	10	297.9	3	0	0.25	74	1010	3
5	2	16	47	20	-1.9	0.052	-9	-9	-999	27	6.7	0.687	0.8	1	0.7	151	10	297.8	3	0	0	85	1011	3
5	2	16	47	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	297.1	3	0	0	999	1012	3
5	2	16	47	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	81	10	296.9	3	0	0	999	1012	99
5	2	16	47	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	79	10	296.9	3	0	0	999	1012	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	16	47	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	98	10	296.2	3	0	0	999	1011	99
5	2	17	48	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	100	10	295.9	3	0	0	999	1010	99
5	2	17	48	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	113	10	295.8	3	0	0.25	97	1010	0
5	2	17	48	3	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	104	10	295.9	3	0	0	95	1010	99
5	2	17	48	4	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	122	10	295.6	3	0	0	93	1010	3
5	2	17	48	5	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	121	10	295.8	3	0	0	93	1011	3
5	2	17	48	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	295.9	3	0	0	89	1011	3
5	2	17	48	7	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	0.76	0.8	95	10	298.9	3	0	0	85	1012	0
5	2	17	48	8	47.6	0.132	-9	-9	-999	110	-4.3	0.212	0.48	0.32	0.8	89	10	301.2	3	0	0	82	1013	0
5	2	17	48	9	114.4	0.173	-9	-9	-999	165	-4.1	0.562	0.7	0.21	0.7	66	10	303	3	0	0	70	1013	0
5	2	17	48	10	145.7	0.208	-9	-9	-999	218	-5.6	0.562	0.7	0.19	0.9	8	10	303.4	3	0	0	63	1013	5
5	2	17	48	11	137.7	0.26	-9	-9	-999	306	-11.6	0.562	0.7	0.18	1.3	334	10	303.2	3	0	0	58	1013	8
5	2	17	48	12	206	0.401	-9	-9	-999	584	-28.3	0.562	0.7	0.18	2.3	335	10	303.2	3	0	0	54	1012	5
5	2	17	48	13	187.3	0.409	-9	-9	-999	602	-33	0.562	0.7	0.18	2.4	336	10	303.2	3	0	0	56	1011	7
5	2	17	48	14	160.7	0.404	-9	-9	-999	590	-36.9	0.562	0.7	0.18	2.4	339	10	303.4	3	0	0	50	1010	7
5	2	17	48	15	109	0.391	-9	-9	-999	563	-49.4	0.562	0.7	0.18	2.4	348	10	303	3	0	0	57	1009	8
5	2	17	48	16	56.9	0.36	-9	-9	-999	498	-73.8	0.562	0.7	0.19	2.3	350	10	302.4	3	0	0	65	1009	9
5	2	17	48	17	7.3	0.125	-9	-9	-999	166	-24	0.562	0.7	0.23	0.7	84	10	301.2	3	0	0	66	1010	10
5	2	17	48	18	0.1	0.105	-9	-9	-999	79	-1036.4	0.212	0.48	0.4	1	100	10	300	3	0	0	67	1010	7
5	2	17	48	19	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	53	10	299.2	3	0	0	72	1011	7
5	2	17	48	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	48	10	298.8	3	0	0	79	1012	7
5	2	17	48	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	53	10	298.4	3	0	0	79	1012	7
5	2	17	48	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	297.5	3	0	0	79	1013	7
5	2	17	48	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	85	10	297.2	3	0	0	74	1013	0
5	2	17	48	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	92	10	296.9	3	0	0	97	1012	7
5	2	18	49	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	296.5	3	0	0	97	1012	7
5	2	18	49	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	79	10	296.4	3	0	0	93	1012	0
5	2	18	49	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	296	3	0	0	97	1011	7
5	2	18	49	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	81	10	295.8	3	0	0	93	1012	3
5	2	18	49	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	54	10	295.9	3	0	0	79	1012	3
5	2	18	49	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	67	10	296.2	3	0	0	93	1013	7
5	2	18	49	7	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	0.75	0.9	65	10	299.2	3	0	0	90	1014	0
5	2	18	49	8	59.2	0.225	0.698	0.005	208	245	-17.3	0.562	0.7	0.31	1.2	38	10	301.4	3	0	0	82	1014	0
5	2	18	49	9	114.3	0.28	1.104	0.005	427	341	-17.4	0.562	0.7	0.21	1.5	3	10	302.8	3	0	0	67	1015	0
5	2	18	49	10	109.9	0.329	1.245	0.005	637	435	-29.4	0.562	0.7	0.19	1.9	343	10	302.4	3	0	0	52	1015	8
5	2	18	49	11	110.9	0.366	1.366	0.005	833	510	-40.2	0.562	0.7	0.18	2.2	345	10	302.4	3	0	0	55	1015	9
5	2	18	49	12	196.7	0.411	1.768	0.005	1017	606	-31.9	0.562	0.7	0.18	2.4	347	10	303.4	3	0	0	52	1014	6
5	2	18	49	13	130.4	0.384	1.598	0.005	1133	548	-39.3	0.562	0.7	0.18	2.3	343	10	303.1	3	0	0	52	1013	8
5	2	18	49	14	134	0.41	1.668	0.005	1253	604	-46.5	0.562	0.7	0.18	2.5	346	10	303	3	0	0	52	1012	8
5	2	18	49	15	107.2	0.415	1.588	0.005	1348	615	-60.2	0.562	0.7	0.18	2.6	344	10	303	3	0	0	44	1012	9
5	2	18	49	16	68.3	0.377	1.386	0.005	1408	533	-70.8	0.562	0.7	0.19	2.4	347	10	302.6	3	0	0	52	1012	9
5	2	18	49	17	29	0.32	1.047	0.005	1431	419	-102.5	0.562	0.7	0.23	2.1	356	10	301.9	3	0	0	53	1012	10
5	2	18	49	18	0.1	0.153	0.158	0.005	1427	158	-3264	0.562	0.7	0.4	1.1	33	10	300.5	3	0	0	67	1012	7
5	2	18	49	19	-3.1	0.069	-9	-9	-999	47	9.7	0.562	0.7	1	1	64	10	299.5	3	0	0	70	1013	7
5	2	18	49	20	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	84	10	298.4	3	0	0	74	1013	0
5	2	18	49	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	297.4	3	0	0	90	1014	7
5	2	18	49	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	297.2	3	0	0	90	1014	7
5	2	18	49	23	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	95	10	296.9	3	0	0	90	1014	0
5	2	18	49	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	104	10	296.4	3	0	0	84	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	19	50	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	105	10	296.1	3	0	0	90	1013	3
5	2	19	50	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	96	10	296.4	3	0	0	90	1013	0
5	2	19	50	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	97	10	296.2	3	0	0	90	1012	3
5	2	19	50	4	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	101	10	296.1	3	0	0	90	1012	3
5	2	19	50	5	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	82	10	296.1	3	0	0	90	1013	0
5	2	19	50	6	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	80	10	296.1	3	0	0	90	1014	7
5	2	19	50	7	-5.2	0.083	-9	-9	-999	55	10.1	0.562	0.7	0.75	1.2	76	10	298.6	3	0	0	90	1014	0
5	2	19	50	8	60.9	0.263	0.734	0.005	235	310	-27.1	0.562	0.7	0.31	1.5	73	10	301.2	3	0	0	77	1015	0
5	2	19	50	9	118.1	0.307	1.183	0.005	507	391	-22.2	0.562	0.7	0.21	1.7	62	10	302.9	3	0	0	59	1015	0
5	2	19	50	10	164.7	0.266	1.553	0.005	825	316	-10.3	0.562	0.7	0.19	1.3	34	10	304.4	3	0	0	52	1015	0
5	2	19	50	11	190.3	0.373	1.717	0.005	964	524	-24.7	0.562	0.7	0.18	2.1	339	10	303.8	3	0	0	44	1015	0
5	2	19	50	12	200.7	0.437	1.891	0.005	1221	663	-37.5	0.562	0.7	0.18	2.6	337	10	303.6	3	0	0	47	1014	6
5	2	19	50	13	172.7	0.419	1.949	0.006	1551	623	-38.4	0.562	0.7	0.18	2.5	342	10	304.1	3	0	0	46	1013	7
5	2	19	50	14	151.7	0.451	1.899	0.009	1633	697	-54.7	0.562	0.7	0.18	2.8	345	10	304	3	0	0	46	1012	8
5	2	19	50	15	41	0.34	1.233	0.009	1653	463	-86.5	0.562	0.7	0.18	2.2	350	10	302.6	3	0	0	49	1012	10
5	2	19	50	16	25.4	0.293	1.054	0.009	1666	366	-89.3	0.562	0.7	0.19	1.9	356	10	302.4	3	0	0	52	1012	10
5	2	19	50	17	9.5	0.24	0.76	0.009	1670	272	-131.8	0.562	0.7	0.23	1.6	25	10	301.9	3	0	0	57	1012	10
5	2	19	50	18	0.1	0.153	0.167	0.009	1666	141	-3265.1	0.562	0.7	0.4	1.1	54	10	300.1	3	0	0	62	1013	7
5	2	19	50	19	-2.5	0.063	-9	-9	-999	40	8.7	0.562	0.7	1	0.9	65	10	299	3	0	0	67	1013	7
5	2	19	50	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	78	10	298.4	3	0	0	70	1014	7
5	2	19	50	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	297.8	3	0	0	74	1014	7
5	2	19	50	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	64	10	297	3	0	0	79	1015	3
5	2	19	50	23	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	78	10	296.9	3	0	0	999	1015	3
5	2	19	50	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	112	10	296.5	3	0	0	999	1014	99
5	2	20	51	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	121	10	296.4	3	0	0	999	1014	99
5	2	20	51	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	108	10	296.4	3	0	0	93	1014	3
5	2	20	51	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	110	10	296	3	0	0	93	1013	3
5	2	20	51	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	105	10	296	3	0	0	90	1013	3
5	2	20	51	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	96	10	295.8	3	0	0	97	1014	0
5	2	20	51	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	57	10	296.5	3	0	0	100	1014	7
5	2	20	51	7	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	0.74	0.9	40	10	298	3	0	0	90	1015	0
5	2	20	51	8	36.6	0.201	0.653	0.005	275	207	-20.1	0.562	0.7	0.31	1.1	52	10	300.2	3	0	0	74	1015	0
5	2	20	51	9	129.3	0.258	1.406	0.005	780	302	-12.1	0.562	0.7	0.21	1.3	77	10	303.2	3	0	0	63	1016	0
5	2	20	51	10	151.7	0.25	1.621	0.005	1019	288	-9.4	0.562	0.7	0.19	1.2	54	10	304.5	3	0	0	45	1016	0
5	2	20	51	11	168.7	0.267	1.808	0.005	1271	316	-10.2	0.562	0.7	0.18	1.3	8	10	304.5	3	0	0	40	1015	6
5	2	20	51	12	171.8	0.254	1.862	0.005	1361	295	-8.7	0.562	0.7	0.18	1.2	32	10	305.9	3	0	0	39	1014	7
5	2	20	51	13	141.6	0.325	1.76	0.005	1393	427	-22	0.562	0.7	0.18	1.8	37	10	305.9	3	0	0	41	1013	8
5	2	20	51	14	149	0.327	1.805	0.005	1426	430	-21.1	0.562	0.7	0.18	1.8	35	10	305.8	3	0	0	43	1012	8
5	2	20	51	15	102.9	0.34	1.623	0.005	1500	455	-34.3	0.562	0.7	0.18	2	43	10	305.1	3	0	0	999	1012	9
5	2	20	51	16	84.6	0.359	1.568	0.005	1645	494	-49.2	0.562	0.7	0.19	2.2	35	10	304.8	3	0	0	999	1012	9
5	2	20	51	17	22.4	0.266	1.012	0.005	1671	319	-75.6	0.562	0.7	0.23	1.7	48	10	302.6	3	0	0	999	1012	10
5	2	20	51	18	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	0.39	1.3	62	10	300.5	3	0	0	999	1012	99
5	2	20	51	19	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1	74	10	299.4	3	0	0	999	1013	99
5	2	20	51	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	49	10	298.9	3	0	0	88	1013	7
5	2	20	51	21	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	64	10	298.4	3	0	0	87	1014	7
5	2	20	51	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	49	10	297.9	3	0	0	86	1014	99
5	2	20	51	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	297.4	3	0	0	85	1015	7
5	2	20	51	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	58	10	296.8	3	0	0	86	1014	7
5	2	21	52	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	59	10	296.4	3	0	0	88	1014	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	21	52	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	63	10	296.6	3	0	0	90	1013	7
5	2	21	52	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	65	10	296.4	3	0	0	91	1013	7
5	2	21	52	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	69	10	295.9	3	0	0	93	1013	3
5	2	21	52	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	59	10	295.6	3	0	0	97	1013	3
5	2	21	52	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	96	10	295.5	3	0	0	93	1014	3
5	2	21	52	7	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	0.74	0.8	90	10	298.4	3	0	0	84	1015	0
5	2	21	52	8	61	0.238	1.003	0.005	598	267	-20	0.562	0.7	0.31	1.3	51	10	300.9	3	0	0	72	1015	0
5	2	21	52	9	125.5	0.308	1.667	0.005	1340	394	-21.2	0.562	0.7	0.21	1.7	62	10	302.9	3	0	0	55	1016	0
5	2	21	52	10	153.4	0.328	1.798	0.005	1375	431	-20.7	0.562	0.7	0.19	1.8	50	10	304.1	3	0	0	52	1015	0
5	2	21	52	11	183.7	0.359	1.929	0.005	1417	495	-22.9	0.562	0.7	0.18	2	45	10	304.4	3	0	0	49	1015	5
5	2	21	52	12	144.5	0.339	1.795	0.005	1450	453	-24.3	0.562	0.7	0.18	1.9	37	10	304.5	3	0	0	45	1014	8
5	2	21	52	13	131.2	0.348	1.751	0.005	1481	471	-28.9	0.562	0.7	0.18	2	43	10	304.4	3	0	0	45	1013	8
5	2	21	52	14	91	0.323	1.558	0.005	1501	423	-33.5	0.562	0.7	0.18	1.9	54	10	303.9	3	0	0	42	1012	9
5	2	21	52	15	71.7	0.292	1.444	0.005	1517	363	-31.3	0.562	0.7	0.18	1.7	52	10	303.5	3	0	0	41	1012	10
5	2	21	52	16	46.3	0.306	1.724	0.005	4000	389	-55.7	0.562	0.7	0.19	1.9	36	10	303	3	0	0	45	1012	10
5	2	21	52	17	16.2	0.273	1.216	0.005	4000	328	-112.9	0.562	0.7	0.23	1.8	31	10	301.2	3	0	0	51	1012	10
5	2	21	52	18	0.1	0.195	0.223	0.005	4000	200	-6691	0.562	0.7	0.39	1.4	39	10	299.5	3	0	0	59	1013	7
5	2	21	52	19	-3.1	0.069	-9	-9	-999	55	9.7	0.562	0.7	1	1	61	10	298.4	3	0	0	66	1013	7
5	2	21	52	20	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	64	10	297.8	3	0	0	74	1014	0
5	2	21	52	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	65	10	297.2	3	0	0	74	1014	7
5	2	21	52	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	296.9	3	0	0	74	1014	7
5	2	21	52	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	92	10	296.4	3	0	0	74	1014	0
5	2	21	52	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	88	10	296.4	3	0	0	74	1014	3
5	2	22	53	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	106	10	295.8	3	0	0	84	1013	3
5	2	22	53	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	96	10	295.4	3	0	0	93	1013	3
5	2	22	53	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	57	10	294.9	3	0	0	84	1013	3
5	2	22	53	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	58	10	294.8	3	0	0	84	1012	7
5	2	22	53	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	294.9	3	0	0	90	1013	7
5	2	22	53	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	66	10	295.4	3	0	0	93	1013	7
5	2	22	53	7	-5.2	0.083	-9	-9	-999	55	10.1	0.562	0.7	0.73	1.2	72	10	297.9	3	0	0	80	1014	0
5	2	22	53	8	48.2	0.233	-9	-9	-999	258	-23.6	0.562	0.7	0.31	1.3	56	10	300.4	3	0	0	67	1015	0
5	2	22	53	9	98.8	0.301	-9	-9	-999	381	-25.1	0.562	0.7	0.21	1.7	70	10	302.8	3	0	0	61	1015	4
5	2	22	53	10	155.4	0.341	-9	-9	-999	458	-23.1	0.562	0.7	0.19	1.9	79	10	303.8	3	0	0	55	1015	4
5	2	22	53	11	104	0.256	-9	-9	-999	300	-14.6	0.212	0.48	0.18	1.9	95	10	303.4	3	0	0	50	1015	8
5	2	22	53	12	141.3	0.32	-9	-9	-999	417	-21	0.212	0.48	0.18	2.5	99	10	303.2	3	0	0	57	1014	7
5	2	22	53	13	64.8	0.273	-9	-9	-999	329	-28.3	0.212	0.48	0.18	2.2	102	10	301.8	3	0	0	65	1014	10
5	2	22	53	14	80.8	0.296	-9	-9	-999	370	-28.8	0.562	0.7	0.18	1.7	68	10	302.5	3	0	0	67	1013	10
5	2	22	53	15	44.2	0.231	-9	-9	-999	256	-25	0.562	0.7	0.18	1.3	41	10	301.8	3	0	0	67	1012	10
5	2	22	53	16	24.2	0.245	-9	-9	-999	278	-54.5	0.212	0.48	0.19	2.1	90	10	302	3	0	0	59	1012	10
5	2	22	53	17	11.2	0.215	-9	-9	-999	230	-80.4	0.212	0.48	0.23	1.9	98	10	300.9	3	0	0	68	1013	10
5	2	22	53	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.39	1.3	96	10	299.2	3	0	0	78	1013	99
5	2	22	53	19	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	89	10	298.1	3	0	0	88	1014	7
5	2	22	53	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	72	10	297.4	3	0	0	85	1014	7
5	2	22	53	21	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	79	10	297	3	0	0	82	1014	7
5	2	22	53	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	77	10	297.1	3	0	0	79	1015	7
5	2	22	53	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	79	10	297	3	0	0	90	1015	7
5	2	22	53	24	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	68	10	296.9	3	0	0	85	1014	7
5	2	23	54	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	296.9	3	0	0	86	1013	7
5	2	23	54	2	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	98	10	296.4	3	0	0	87	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	23	54	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	78	10	296.2	3	0	0	90	1012	7
5	2	23	54	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	89	10	295.9	3	0	0	97	1012	7
5	2	23	54	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	84	10	295.6	3	0	0	97	1013	7
5	2	23	54	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	76	10	295.8	3	0	0	90	1013	7
5	2	23	54	7	-2.3	0.056	-9	-9	-999	30	6.8	0.562	0.7	0.73	0.8	83	10	298.9	3	0	0	84	1014	0
5	2	23	54	8	47.1	0.232	0.655	0.005	216	257	-24	0.562	0.7	0.31	1.3	70	10	301	3	0	0	74	1015	0
5	2	23	54	9	123.7	0.333	1.149	0.005	444	442	-27.1	0.562	0.7	0.21	1.9	76	10	302.6	3	0	0	63	1015	0
5	2	23	54	10	153.6	0.341	1.608	0.006	981	457	-23.3	0.562	0.7	0.18	1.9	83	10	303.8	3	0	0	59	1015	4
5	2	23	54	11	181.8	0.346	1.758	0.006	1083	468	-20.6	0.562	0.7	0.18	1.9	77	10	304.2	3	0	0	999	1015	6
5	2	23	54	12	128.7	0.28	1.601	0.007	1156	343	-15.5	0.212	0.48	0.18	2.1	95	10	304.8	3	0	0	999	1014	7
5	2	23	54	13	104.9	0.256	1.521	0.007	1215	298	-14.5	0.212	0.48	0.18	1.9	106	10	304.6	3	0	0	999	1013	9
5	2	23	54	14	104.4	0.265	1.544	0.006	1273	314	-16.1	0.212	0.48	0.18	2	94	10	304	3	0	0.25	52	1012	8
5	2	23	54	15	103.9	0.265	1.564	0.005	1331	314	-16.2	0.212	0.48	0.18	2	94	10	303.5	3	0	0	55	1012	8
5	2	23	54	16	59.5	0.337	1.309	0.005	1363	449	-57.9	0.562	0.7	0.19	2.1	84	10	303.4	3	0	0	59	1012	9
5	2	23	54	17	4.6	0.178	0.557	0.005	1363	188	-111.3	0.212	0.48	0.23	1.6	88	10	301.6	3	0	0	63	1012	10
5	2	23	54	18	0.1	0.126	0.156	0.005	1360	104	-1805.7	0.562	0.7	0.39	0.9	63	10	300.2	3	0	0	66	1013	3
5	2	23	54	19	-0.8	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	47	10	298.6	3	0	0	70	1014	99
5	2	23	54	20	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	44	10	298	3	0	0	74	1014	3
5	2	23	54	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	44	10	297.6	3	0	0	85	1015	3
5	2	23	54	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	57	10	297.6	3	0	0	85	1015	3
5	2	23	54	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	296.9	3	0	0	97	1015	3
5	2	23	54	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	296.4	3	0	0	97	1014	3
5	2	24	55	1	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	82	10	296.5	3	0	0	97	1014	3
5	2	24	55	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	61	10	295.9	3	0	0	90	1013	0
5	2	24	55	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	295.4	3	0	0	97	1013	3
5	2	24	55	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	295.5	3	0	0	93	1013	3
5	2	24	55	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	91	10	295.5	3	0	0	93	1013	0
5	2	24	55	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	295.9	3	0	0	93	1014	3
5	2	24	55	7	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	0.72	0.9	73	10	299	3	0	0	90	1015	0
5	2	24	55	8	65.1	0.227	0.756	0.005	240	248	-16.2	0.562	0.7	0.31	1.2	68	10	301.5	3	0	0	77	1015	0
5	2	24	55	9	127.9	0.334	1.218	0.005	512	445	-26.5	0.562	0.7	0.21	1.9	83	10	303.4	3	0	0	63	1016	0
5	2	24	55	10	126.9	0.27	1.4	0.005	785	325	-14.1	0.212	0.48	0.19	2	100	10	304.6	3	0	0	55	1016	0
5	2	24	55	11	116.6	0.268	1.447	0.005	943	319	-15	0.212	0.48	0.18	2	104	10	304.8	3	0	0	52	1015	8
5	2	24	55	12	54.9	0.25	1.14	0.005	978	288	-25.8	0.212	0.48	0.18	2	116	10	299.8	3	0	0	52	1015	10
5	2	24	55	13	103.7	0.227	1.447	0.005	1058	248	-10.1	0.212	0.48	0.18	1.6	115	10	302.4	3	0	0	63	1014	8
5	2	24	55	14	81.8	0.296	1.362	0.005	1117	370	-28.6	0.562	0.7	0.18	1.7	58	10	301	3	0	0.25	85	1013	9
5	2	24	55	15	70.7	0.254	1.318	0.006	1171	296	-21	0.562	0.7	0.18	1.4	79	10	301.9	3	0	0	70	1013	9
5	2	24	55	16	36.1	0.214	1.062	0.006	1199	228	-24.5	0.212	0.48	0.19	1.7	107	10	302.4	3	0	0	55	1013	10
5	2	24	55	17	8.5	0.184	0.655	0.006	1202	181	-66.2	0.212	0.48	0.23	1.6	94	10	300.9	3	0	0	72	1013	10
5	2	24	55	18	0.1	0.14	0.149	0.006	1200	120	-2464.1	0.562	0.7	0.39	1	70	10	299.9	3	0	0	82	1013	7
5	2	24	55	19	-2.8	0.063	-9	-9	-999	38	7.8	0.562	0.7	1	0.9	74	10	298.9	3	0	0	88	1014	3
5	2	24	55	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	298.4	3	0	0	88	1015	7
5	2	24	55	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	82	10	298	3	0	0	89	1015	7
5	2	24	55	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	88	10	297.5	3	0	0	90	1015	99
5	2	24	55	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	108	10	297.4	3	0	0	91	1015	3
5	2	24	55	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	59	10	297.4	3	0	0	88	1015	3
5	2	25	56	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	297.1	3	0	0	88	1014	3
5	2	25	56	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	77	10	296.9	3	0	0	91	1013	7
5	2	25	56	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	296.9	3	0	0	94	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	25	56	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	74	10	296.9	3	0	0.25	94	1013	3
5	2	25	56	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	59	10	296.8	3	0	0	94	1013	7
5	2	25	56	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	297.1	3	0	0	100	1014	3
5	2	25	56	7	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	0.71	0.9	83	10	298.5	3	0	0	95	1014	0
5	2	25	56	8	41.3	0.207	0.658	0.005	249	217	-19.4	0.212	0.48	0.3	1.6	94	10	301.6	3	0	0	91	1015	0
5	2	25	56	9	77.4	0.248	0.979	0.005	439	285	-17.9	0.212	0.48	0.21	1.9	106	10	302.9	3	0	0	80	1016	0
5	2	25	56	10	138.7	0.32	1.441	0.005	782	416	-21.3	0.212	0.48	0.19	2.5	110	10	304.5	3	0	0	61	1015	0
5	2	25	56	11	150.7	0.332	1.576	0.006	942	439	-21.9	0.212	0.48	0.18	2.6	111	10	304.9	3	0	0	61	1015	4
5	2	25	56	12	107.8	0.313	1.442	0.006	1008	403	-25.7	0.212	0.48	0.18	2.5	102	10	304.6	3	0	0	61	1014	8
5	2	25	56	13	131.8	0.328	1.584	0.006	1090	432	-24.1	0.212	0.48	0.18	2.6	116	10	305	3	0	0	50	1013	7
5	2	25	56	14	132	0.318	1.624	0.006	1172	413	-22.1	0.212	0.48	0.18	2.5	110	10	305.4	3	0	0	52	1012	7
5	2	25	56	15	85	0.307	1.423	0.006	1223	392	-30.8	0.212	0.48	0.18	2.5	100	10	304.4	3	0	0	56	1012	9
5	2	25	56	16	48.3	0.304	1.188	0.007	1251	385	-52.3	0.212	0.48	0.19	2.6	109	10	303.4	3	0	0	60	1012	9
5	2	25	56	17	11.6	0.263	0.738	0.007	1254	312	-142.7	0.212	0.48	0.23	2.4	108	10	301.6	3	0	0	65	1012	10
5	2	25	56	18	0.1	0.187	0.152	0.007	1252	188	-5916.4	0.212	0.48	0.39	1.8	109	10	300.2	3	0	0	69	1012	7
5	2	25	56	19	-1	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	108	10	299.2	3	0	0	74	1013	99
5	2	25	56	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	94	10	298.9	3	0	0	79	1013	7
5	2	25	56	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	298.6	3	0	0	80	1014	7
5	2	25	56	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	77	10	298.2	3	0	0	81	1014	99
5	2	25	56	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	77	10	297.9	3	0	0	82	1014	3
5	2	25	56	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	297.8	3	0	0	85	1014	3
5	2	26	57	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	73	10	297.5	3	0	0	88	1013	99
5	2	26	57	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	297.2	3	0	0	91	1013	3
5	2	26	57	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	44	10	296.9	3	0	0	92	1013	3
5	2	26	57	4	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	64	10	297.2	3	0	0	94	1013	0
5	2	26	57	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	79	10	297.1	3	0	0	90	1013	7
5	2	26	57	6	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	109	10	297	3	0	0	88	1014	7
5	2	26	57	7	-3.9	0.067	-9	-9	-999	40	7.1	0.212	0.48	0.71	1.3	112	10	299.8	3	0	0	88	1014	0
5	2	26	57	8	50.5	0.249	0.77	0.005	328	285	-27.6	0.212	0.48	0.3	2	98	10	302	3	0	0	82	1015	0
5	2	26	57	9	101.2	0.376	1.224	0.005	656	531	-47.7	0.562	0.7	0.21	2.3	84	10	303.2	3	0	0	67	1015	4
5	2	26	57	10	103.6	0.274	1.336	0.005	834	335	-18	0.212	0.48	0.19	2.1	93	10	304.2	3	0	0	55	1016	7
5	2	26	57	11	146.4	0.303	1.571	0.005	961	383	-17.2	0.212	0.48	0.18	2.3	96	10	305.2	3	0	0	52	1015	5
5	2	26	57	12	118.6	0.269	1.516	0.005	1064	321	-14.8	0.212	0.48	0.18	2	97	10	305.4	3	0	0	54	1014	8
5	2	26	57	13	131.8	0.318	1.624	0.005	1177	413	-22.1	0.212	0.48	0.18	2.5	116	10	304.9	3	0	0	59	1014	8
5	2	26	57	14	115.9	0.334	1.599	0.005	1275	444	-29	0.212	0.48	0.18	2.7	100	10	303	3	0	0	74	1013	8
5	2	26	57	15	72.4	0.275	1.413	0.006	1408	333	-26	0.212	0.48	0.18	2.2	103	10	302.8	3	0	0	70	1013	9
5	2	26	57	16	48.1	0.266	1.259	0.007	1499	316	-35.5	0.212	0.48	0.19	2.2	110	10	303	3	0	0	55	1012	9
5	2	26	57	17	8.7	0.222	0.715	0.007	1507	241	-113.3	0.212	0.48	0.23	2	114	10	301.5	3	0	0	57	1012	10
5	2	26	57	18	0.1	0.136	0.161	0.007	1498	117	-2247.8	0.212	0.48	0.39	1.3	113	10	299.9	3	0	0	63	1013	7
5	2	26	57	19	-1.3	0.042	-9	-9	-999	27	5	0.212	0.48	1	0.8	108	10	298.8	3	0	0	74	1013	7
5	2	26	57	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	298.1	3	0	0	79	1013	3
5	2	26	57	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	73	10	297.4	3	0	0	85	1014	7
5	2	26	57	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	296.8	3	0	0	86	1014	7
5	2	26	57	23	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	35	10	296.2	3	0	0	87	1014	0
5	2	26	57	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	296.2	3	0	0	97	1013	7
5	2	27	58	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	35	10	296.2	3	0	0	97	1013	7
5	2	27	58	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	48	10	295.9	3	0	0	97	1012	7
5	2	27	58	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	65	10	295.8	3	0	0	97	1012	7
5	2	27	58	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	295.5	3	0	0	95	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	2	27	58	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	295.5	3	0	0	93	1012	7
5	2	27	58	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	82	10	296.1	3	0	0	96	1013	7
5	2	27	58	7	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	0.7	0.8	86	10	299.4	3	0	0	100	1014	0
5	2	27	58	8	67.3	0.24	0.761	0.005	237	271	-18.7	0.562	0.7	0.3	1.3	84	10	301.5	3	0	0	82	1015	0
5	2	27	58	9	100.8	0.255	1.322	0.005	830	296	-14.9	0.212	0.48	0.21	1.9	106	10	303.4	3	0	0	65	1015	0
5	2	27	58	10	131.5	0.271	1.539	0.005	1004	325	-13.7	0.212	0.48	0.19	2	108	10	304.9	3	0	0	55	1015	0
5	2	27	58	11	157	0.286	1.739	0.005	1214	351	-13.5	0.212	0.48	0.18	2.1	112	10	306.1	3	0	0	48	1014	0
5	2	27	58	12	170	0.249	1.886	0.008	1428	287	-8.2	0.212	0.48	0.18	1.7	109	10	307	3	0	0	47	1013	5
5	2	27	58	13	141.9	0.244	1.812	0.01	1516	278	-9.3	0.212	0.48	0.18	1.7	109	10	307	3	0	0	50	1012	7
5	2	27	58	14	62	0.225	1.385	0.011	1549	245	-16.5	0.212	0.48	0.18	1.7	105	10	305.2	3	0	0	50	1012	10
5	2	27	58	15	72.9	0.304	1.475	0.011	1590	385	-34.6	0.212	0.48	0.18	2.5	116	10	303.9	3	0	0	61	1012	9
5	2	27	58	16	22.6	0.253	1.001	0.012	1599	293	-64.5	0.212	0.48	0.19	2.2	102	10	301.9	3	0	0	63	1012	10
5	2	27	58	17	6.9	0.211	0.673	0.012	1600	223	-123.5	0.562	0.7	0.23	1.4	79	10	300.4	3	0	0	91	1012	10
5	2	27	58	18	0.1	0.167	0.165	0.012	1599	158	-4226.6	0.562	0.7	0.39	1.2	73	10	299.8	3	0	0	84	1012	3
5	2	27	58	19	-4.5	0.083	-9	-9	-999	58	11.6	0.562	0.7	1	1.2	78	10	299	3	0	0	77	1013	7
5	2	27	58	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	88	10	298.4	3	0	0	85	1013	7
5	2	27	58	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	76	10	297.9	3	0	0	88	1013	7
5	2	27	58	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	297.6	3	0	0	94	1014	7
5	2	27	58	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	297.6	3	0	0	91	1013	7
5	2	27	58	24	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	70	10	297.6	3	0	0	92	1013	7
5	2	28	59	1	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	70	10	297.5	3	0	0	94	1013	3
5	2	28	59	2	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	105	10	297.6	3	0	0	100	1012	7
5	2	28	59	3	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	95	10	297.4	3	0	0	100	1012	7
5	2	28	59	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	98	10	297.4	3	0	0	100	1012	7
5	2	28	59	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	54	10	297.5	3	0	0	97	1013	7
5	2	28	59	6	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	92	10	297.9	3	0	0	94	1013	3
5	2	28	59	7	-5.9	0.083	-9	-9	-999	55	8.8	0.212	0.48	0.7	1.6	99	10	299.8	3	0	0	94	1014	0
5	2	28	59	8	53.2	0.259	0.758	0.005	295	303	-29.6	0.212	0.48	0.3	2.1	100	10	301.9	3	0	0	85	1014	0
5	2	28	59	9	82	0.287	1.1	0.005	588	354	-26.2	0.212	0.48	0.21	2.3	97	10	303.1	3	0	0	75	1015	0
5	2	28	59	10	87	0.308	1.262	0.005	837	393	-30.3	0.212	0.48	0.19	2.5	90	10	303.4	3	0	0	999	1015	8
5	2	28	59	11	117.8	0.306	1.484	0.007	1005	389	-22	0.212	0.48	0.18	2.4	92	10	304.2	3	0	0	999	1014	7
5	2	28	59	12	115.2	0.296	1.519	0.007	1101	370	-20.3	0.212	0.48	0.18	2.3	101	10	304.6	3	0	0	999	1014	8
5	2	28	59	13	115.3	0.286	1.544	0.007	1155	353	-18.4	0.212	0.48	0.18	2.2	105	10	304.8	3	0	0	999	1013	8
5	2	28	59	14	91.4	0.262	1.446	0.007	1197	308	-17.7	0.212	0.48	0.18	2	101	10	304.6	3	0	0	50	1013	9
5	2	28	59	15	47.6	0.238	1.171	0.007	1218	267	-25.5	0.212	0.48	0.18	1.9	100	10	303.8	3	0	0	51	1012	10
5	2	28	59	16	26.1	0.218	0.961	0.007	1229	234	-35.8	0.212	0.48	0.19	1.8	99	10	302.9	3	0	0	52	1012	10
5	2	28	59	17	11.7	0.206	0.737	0.007	1233	215	-67.6	0.212	0.48	0.23	1.8	107	10	301.9	3	0	0	53	1012	10
5	2	28	59	18	0.1	0.136	0.151	0.007	1231	116	-2248.5	0.212	0.48	0.39	1.3	109	10	300.4	3	0	0	62	1013	3
5	2	28	59	19	-0.7	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	116	10	299.2	3	0	0	72	1013	99
5	2	28	59	20	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	108	10	298.4	3	0	0	82	1014	0
5	2	28	59	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	297.9	3	0	0	85	1014	3
5	2	28	59	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	53	10	297.1	3	0	0	85	1015	3
5	2	28	59	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	58	10	296.6	3	0	0	90	1015	0
5	2	28	59	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	52	10	296	3	0	0	97	1014	3
5	3	1	60	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	44	10	295.9	3	0	0	100	1014	3
5	3	1	60	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	41	10	295.4	3	0	0	97	1013	0
5	3	1	60	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	43	10	295.1	3	0	0	93	1013	3
5	3	1	60	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	37	10	295	3	0	0	93	1013	3
5	3	1	60	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	47	10	294.9	3	0	0	93	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	1	60	6	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	97	10	295.2	3	0	0	100	1015	3
5	3	1	60	7	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	0.69	0.6	82	10	298.9	3	0	0	93	1015	0
5	3	1	60	8	54.8	0.174	0.994	0.005	650	167	-8.7	0.212	0.48	0.3	1.2	97	10	302	3	0	0	85	1015	0
5	3	1	60	9	92.4	0.243	1.25	0.005	766	276	-14.1	0.212	0.48	0.21	1.8	104	10	303.8	3	0	0	72	1016	0
5	3	1	60	10	124	0.279	1.447	0.005	886	339	-15.9	0.212	0.48	0.19	2.1	108	10	304.6	3	0	0	59	1016	0
5	3	1	60	11	133.2	0.291	1.549	0.005	1010	360	-16.7	0.212	0.48	0.18	2.2	112	10	305.2	3	0	0	59	1015	7
5	3	1	60	12	133.6	0.291	1.612	0.005	1135	361	-16.6	0.212	0.48	0.18	2.2	117	10	305.5	3	0	0	54	1014	7
5	3	1	60	13	165.2	0.306	1.807	0.005	1291	390	-15.7	0.212	0.48	0.18	2.3	120	10	306.2	3	0	0	52	1013	6
5	3	1	60	14	66.3	0.273	1.353	0.005	1351	329	-27.8	0.212	0.48	0.18	2.2	113	10	304.9	3	0	0	50	1012	10
5	3	1	60	15	68.9	0.265	1.392	0.005	1415	313	-24.3	0.212	0.48	0.18	2.1	113	10	304.8	3	0	0	52	1012	9
5	3	1	60	16	32.3	0.278	1.088	0.006	1441	336	-59.8	0.212	0.48	0.19	2.4	112	10	303.4	3	0	0	56	1012	10
5	3	1	60	17	11.8	0.235	0.779	0.006	1448	262	-99.4	0.212	0.48	0.23	2.1	114	10	302	3	0	0	57	1012	10
5	3	1	60	18	0.1	0.166	0.159	0.006	1444	157	-4162.8	0.212	0.48	0.39	1.6	117	10	300.4	3	0	0	72	1012	3
5	3	1	60	19	-2.3	0.052	-9	-9	-999	39	5.6	0.212	0.48	1	1	98	10	299.4	3	0	0	77	1012	3
5	3	1	60	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	109	10	298.4	3	0	0	82	1013	3
5	3	1	60	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	103	10	298.1	3	0	0	999	1014	3
5	3	1	60	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	99	10	297.8	3	0	0	999	1014	99
5	3	1	60	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	106	10	297.8	3	0	0	999	1014	99
5	3	1	60	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	101	10	297.5	3	0	0	999	1013	99
5	3	2	61	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	122	10	297.8	3	0	0	999	1013	99
5	3	2	61	2	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	110	10	297.6	3	0	0	87	1013	3
5	3	2	61	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	99	10	297.2	3	0	0	87	1012	3
5	3	2	61	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	106	10	297	3	0	0	87	1013	99
5	3	2	61	5	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	105	10	297.1	3	0	0	87	1013	3
5	3	2	61	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	68	10	297.4	3	0	0	81	1014	3
5	3	2	61	7	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	0.69	0.7	25	10	299.5	3	0	0	75	1015	0
5	3	2	61	8	55.2	0.198	1.113	0.005	905	202	-12.7	0.562	0.7	0.3	1	66	10	302	3	0	0	70	1015	0
5	3	2	61	9	89.5	0.243	1.361	0.005	1022	275	-14.4	0.212	0.48	0.21	1.8	103	10	303.4	3	0	0	63	1016	0
5	3	2	61	10	123	0.26	1.637	0.005	1294	305	-12.9	0.212	0.48	0.19	1.9	105	10	304.8	3	0	0	55	1015	5
5	3	2	61	11	164.2	0.277	1.82	0.005	1331	336	-11.7	0.212	0.48	0.18	2	115	10	305.8	3	0	0	47	1015	0
5	3	2	61	12	96.3	0.254	1.532	0.005	1352	294	-15.4	0.212	0.48	0.18	1.9	111	10	305.4	3	0	0	52	1014	9
5	3	2	61	13	66.3	0.226	1.358	0.005	1367	248	-15.8	0.212	0.48	0.18	1.7	94	10	304.9	3	0	0	47	1013	10
5	3	2	61	14	69.2	0.236	1.383	0.005	1382	264	-17.2	0.212	0.48	0.18	1.8	107	10	304.9	3	0	0	46	1012	9
5	3	2	61	15	48.1	0.229	1.229	0.005	1393	252	-22.4	0.212	0.48	0.18	1.8	112	10	304.8	3	0	0	49	1012	10
5	3	2	61	16	26.4	0.236	1.007	0.005	1398	264	-45.2	0.212	0.48	0.19	2	115	10	303.4	3	0	0	49	1012	10
5	3	2	61	17	4.8	0.178	0.57	0.005	1398	174	-107.2	0.212	0.48	0.23	1.6	112	10	302	3	0	0	57	1012	10
5	3	2	61	18	0.1	0.136	0.157	0.005	1397	115	-2246.3	0.212	0.48	0.38	1.3	112	10	300.4	3	0	0	67	1012	3
5	3	2	61	19	-2.3	0.052	-9	-9	-999	31	5.6	0.212	0.48	1	1	108	10	299	3	0	0	72	1012	3
5	3	2	61	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	113	10	298.2	3	0	0	77	1013	3
5	3	2	61	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	113	10	297.6	3	0	0	81	1013	3
5	3	2	61	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	103	10	297.2	3	0	0	85	1013	99
5	3	2	61	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	297	3	0	0	90	1013	3
5	3	2	61	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	61	10	296.6	3	0	0	91	1012	3
5	3	3	62	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	76	10	296.4	3	0	0	92	1012	99
5	3	3	62	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	296.1	3	0	0	93	1012	3
5	3	3	62	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	92	10	296.5	3	0	0	94	1012	3
5	3	3	62	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	56	10	296.1	3	0	0	95	1012	99
5	3	3	62	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	47	10	295.9	3	0	0	97	1013	7
5	3	3	62	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	295.9	3	0	0	97	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	3	62	7	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	0.68	0.5	85	10	297.4	3	0	0	97	1014	0
5	3	3	62	8	40	0.228	0.558	0.005	157	251	-26.9	0.562	0.7	0.29	1.3	56	10	300.4	3	0	0	97	1015	5
5	3	3	62	9	134.1	0.324	1.118	0.005	377	423	-22.9	0.562	0.7	0.2	1.8	82	10	303.5	3	0	0	70	1015	0
5	3	3	62	10	89	0.204	1.253	0.005	800	218	-8.6	0.212	0.48	0.18	1.4	98	10	304.4	3	0	0	55	1015	8
5	3	3	62	11	67.9	-9	-9	-9	1001	-999	-99999	0.475	0.6	0.17	0	0	10	304	3	0	0	50	1015	10
5	3	3	62	12	60	0.275	1.249	0.005	1174	331	-31.2	0.562	0.7	0.18	1.6	337	10	302.5	3	0	0	50	1014	10
5	3	3	62	13	63.8	0.314	1.307	0.006	1266	404	-43.8	0.562	0.7	0.18	1.9	341	10	302.4	3	0	0	49	1013	10
5	3	3	62	14	98.3	0.314	1.534	0.006	1326	404	-28.3	0.562	0.7	0.18	1.8	342	10	303.4	3	0	0	49	1013	9
5	3	3	62	15	43.5	0.153	1.177	0.006	1353	155	-7.4	0.562	0.7	0.18	0.7	41	10	303.6	3	0	0	52	1012	10
5	3	3	62	16	12.6	0.188	0.781	0.006	1359	188	-47.7	0.212	0.48	0.19	1.6	120	10	302.4	3	0	0	55	1012	10
5	3	3	62	17	6.1	0.171	0.612	0.006	1362	162	-74.2	0.212	0.48	0.23	1.5	92	10	301.9	3	0	0	57	1013	10
5	3	3	62	18	0.1	0.136	0.156	0.006	1360	115	-2248.5	0.212	0.48	0.38	1.3	104	10	300.4	3	0	0	63	1013	3
5	3	3	62	19	-3.3	0.062	-9	-9	-999	37	6.7	0.212	0.48	1	1.2	110	10	299.9	3	0	0	69	1013	3
5	3	3	62	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	109	10	299	3	0	0	77	1014	3
5	3	3	62	21	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	298	3	0	0	69	1014	3
5	3	3	62	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	297.2	3	0	0	69	1014	3
5	3	3	62	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	80	10	296.5	3	0	0	82	1014	0
5	3	3	62	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	78	10	296	3	0	0	86	1014	99
5	3	4	63	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	82	10	295.6	3	0	0	90	1013	3
5	3	4	63	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	53	10	295.2	3	0	0	90	1013	3
5	3	4	63	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	119	10	295.2	3	0	0	93	1013	3
5	3	4	63	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	71	10	295.2	3	0	0	93	1013	3
5	3	4	63	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	63	10	295.2	3	0	0	93	1014	0
5	3	4	63	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	99	10	295.8	3	0	0	93	1014	3
5	3	4	63	7	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	0.67	0.6	102	10	299.2	3	0	0	90	1015	0
5	3	4	63	8	56.4	0.232	0.608	0.005	144	257	-20	0.212	0.48	0.29	1.8	114	10	301.9	3	0	0	77	1015	0
5	3	4	63	9	101.1	0.292	1.04	0.005	403	364	-22.4	0.212	0.48	0.21	2.3	115	10	303.2	3	0	0	70	1016	0
5	3	4	63	10	139	0.282	1.431	0.005	764	345	-14.7	0.212	0.48	0.18	2.1	119	10	304.9	3	0	0	59	1015	0
5	3	4	63	11	143.6	0.274	1.671	0.005	1178	330	-12.9	0.212	0.48	0.18	2	106	10	305.4	3	0	0	54	1015	6
5	3	4	63	12	160.7	0.277	1.779	0.005	1268	335	-12	0.212	0.48	0.18	2	114	10	306.1	3	0	0	55	1014	6
5	3	4	63	13	156.3	0.286	1.802	0.007	1356	351	-13.5	0.212	0.48	0.18	2.1	110	10	306.1	3	0	0	49	1013	6
5	3	4	63	14	130.7	0.271	1.732	0.006	1437	325	-13.8	0.212	0.48	0.18	2	117	10	305.9	3	0	0	49	1012	7
5	3	4	63	15	94.4	0.281	1.577	0.007	1500	343	-21.3	0.212	0.48	0.18	2.2	125	10	305.4	3	0	0	42	1012	8
5	3	4	63	16	54.7	0.25	1.328	0.008	1546	288	-25.8	0.212	0.48	0.19	2	106	10	304.4	3	0	0	49	1012	9
5	3	4	63	17	11.9	0.206	0.799	0.008	1551	216	-66.8	0.212	0.48	0.23	1.8	106	10	302.2	3	0	0	59	1012	10
5	3	4	63	18	0.1	0.136	0.163	0.008	1542	116	-2247.8	0.212	0.48	0.38	1.3	106	10	300.5	3	0	0	67	1013	7
5	3	4	63	19	-1.6	0.047	-9	-9	-999	28	5.6	0.212	0.48	1	0.9	93	10	299.5	3	0	0	72	1013	7
5	3	4	63	20	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	75	10	299.1	3	0	0	77	1014	3
5	3	4	63	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	298.5	3	0	0	79	1015	3
5	3	4	63	22	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	80	10	298.1	3	0	0	79	1015	3
5	3	4	63	23	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	91	10	297.8	3	0	0	87	1015	3
5	3	4	63	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	297.4	3	0	0	90	1015	3
5	3	5	64	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	92	10	296.9	3	0	0	90	1014	3
5	3	5	64	2	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	91	10	297	3	0	0	93	1013	3
5	3	5	64	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	115	10	296.5	3	0	0	97	1013	3
5	3	5	64	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	296.1	3	0	0	100	1013	3
5	3	5	64	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	296	3	0	0	93	1014	3
5	3	5	64	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	103	10	296	3	0	0	100	1014	7
5	3	5	64	7	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	0.67	1.1	114	10	298.5	3	0	0	97	1015	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	5	64	8	54	0.24	0.674	0.005	205	271	-23.3	0.212	0.48	0.29	1.9	113	10	301.8	3	0	0	87	1015	0
5	3	5	64	9	104.1	0.293	1.061	0.005	415	365	-21.9	0.212	0.48	0.2	2.3	127	10	303.4	3	0	0	74	1016	0
5	3	5	64	10	114.2	0.277	1.423	0.005	914	335	-16.9	0.212	0.48	0.18	2.1	134	10	304.6	3	0	0	62	1016	6
5	3	5	64	11	151.1	0.275	1.662	0.005	1102	332	-12.5	0.212	0.48	0.18	2	127	10	305.5	3	0	0	50	1015	5
5	3	5	64	12	129.2	0.242	1.651	0.011	1262	274	-9.9	0.212	0.48	0.18	1.7	122	10	305.5	3	0	0	48	1014	8
5	3	5	64	13	148.9	0.245	1.813	0.012	1448	280	-9	0.212	0.48	0.18	1.7	128	10	306.2	3	0	0	47	1013	7
5	3	5	64	14	90.6	0.195	1.567	0.013	1535	198	-7.3	0.212	0.48	0.18	1.3	135	10	305.9	3	0	0	46	1012	9
5	3	5	64	15	37.8	0.205	1.174	0.013	1545	214	-20.7	0.212	0.48	0.18	1.6	123	10	304.9	3	0	0	49	1012	10
5	3	5	64	16	19.2	0.175	0.959	0.015	1658	169	-25.4	0.212	0.48	0.19	1.4	122	10	303.8	3	0	0	49	1011	10
5	3	5	64	17	6.3	0.209	0.662	0.015	1658	220	-131.5	0.212	0.48	0.23	1.9	121	10	302.4	3	0	0	59	1012	10
5	3	5	64	18	0.1	0.146	0.167	0.015	1658	129	-2799.3	0.212	0.48	0.38	1.4	108	10	300.4	3	0	0	72	1012	7
5	3	5	64	19	-2.9	0.062	-9	-9	-999	39	7.5	0.212	0.48	1	1.2	87	10	299.4	3	0	0	74	1013	7
5	3	5	64	20	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	74	10	298.5	3	0	0	79	1014	7
5	3	5	64	21	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	83	10	297.9	3	0	0	79	1014	7
5	3	5	64	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	88	10	297.5	3	0	0	79	1015	99
5	3	5	64	23	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	87	10	297.4	3	0	0	79	1015	0
5	3	5	64	24	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	80	10	297.2	3	0	0	85	1015	7
5	3	6	65	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	297	3	0	0	79	1014	7
5	3	6	65	2	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	83	10	296.9	3	0	0	87	1013	0
5	3	6	65	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	296.9	3	0	0	97	1013	7
5	3	6	65	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	296.9	3	0	0	90	1013	3
5	3	6	65	5	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	68	10	296.8	3	0	0	90	1014	3
5	3	6	65	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	296.9	3	0	0	93	1014	7
5	3	6	65	7	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	0.66	0.8	71	10	299.8	3	0	0	79	1016	0
5	3	6	65	8	72.6	0.242	0.75	0.007	211	274	-17.7	0.562	0.7	0.29	1.3	77	10	302.5	3	0	0	76	1016	0
5	3	6	65	9	108.8	0.237	1.02	0.006	354	266	-11.2	0.212	0.48	0.2	1.7	93	10	303.9	3	0	0	63	1017	0
5	3	6	65	10	132.2	0.223	1.245	0.005	530	242	-7.6	0.212	0.48	0.18	1.5	104	10	305.9	3	0	0	56	1016	0
5	3	6	65	11	149.3	0.263	1.464	0.005	762	310	-11	0.562	0.7	0.18	1.3	85	10	306.2	3	0	0	49	1016	8
5	3	6	65	12	101	0.246	1.365	0.005	912	280	-13.3	0.212	0.48	0.18	1.8	91	10	305.9	3	0	0	50	1015	9
5	3	6	65	13	90.7	0.224	1.375	0.005	1038	243	-11.1	0.212	0.48	0.18	1.6	94	10	306	3	0	0	50	1014	9
5	3	6	65	14	33.4	0.194	0.999	0.005	1080	196	-19.7	0.212	0.48	0.18	1.5	97	10	304.8	3	0	0	49	1013	10
5	3	6	65	15	46.6	0.209	1.139	0.005	1145	220	-17.8	0.212	0.48	0.18	1.6	95	10	304.6	3	0	0	53	1013	10
5	3	6	65	16	20.6	0.205	0.874	0.005	1170	213	-37.6	0.212	0.48	0.19	1.7	100	10	303.6	3	0	0	58	1013	10
5	3	6	65	17	9.1	0.184	0.668	0.005	1180	182	-62.1	0.212	0.48	0.23	1.6	114	10	302.4	3	0	0	63	1012	10
5	3	6	65	18	0.1	0.166	0.148	0.005	1173	156	-4164.2	0.212	0.48	0.38	1.6	118	10	300.5	3	0	0	70	1012	7
5	3	6	65	19	-1	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	102	10	299.4	3	0	0	77	1013	99
5	3	6	65	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	86	10	298.9	3	0	0	85	1014	7
5	3	6	65	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	48	10	298	3	0	0	84	1014	7
5	3	6	65	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1	73	10	297.8	3	0	0	83	1015	99
5	3	6	65	23	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	78	10	297.2	3	0	0	82	1015	7
5	3	6	65	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	80	10	296.9	3	0	0	82	1014	7
5	3	7	66	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	118	10	296.8	3	0	0	83	1014	99
5	3	7	66	2	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	111	10	296.2	3	0	0	84	1013	7
5	3	7	66	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	113	10	296.1	3	0	0	999	1013	7
5	3	7	66	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	82	10	295.9	3	0	0	999	1013	99
5	3	7	66	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	39	10	295.1	3	0	0	999	1013	99
5	3	7	66	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.5	53	10	295.4	3	0	0	999	1014	99
5	3	7	66	7	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	0.66	0.9	59	10	298.5	3	0	0	999	1015	0
5	3	7	66	8	62.3	0.276	0.797	0.005	294	333	-30.4	0.562	0.7	0.29	1.6	81	10	301.4	3	0	0	74	1015	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	7	66	9	119.7	0.32	1.394	0.005	820	416	-24.7	0.562	0.7	0.2	1.8	75	10	303.5	3	0	0	59	1016	0
5	3	7	66	10	171.5	0.319	1.81	0.009	1256	414	-17.1	0.562	0.7	0.18	1.7	73	10	305.4	3	0	0	55	1016	0
5	3	7	66	11	139.6	0.234	1.812	0.017	1545	263	-8.3	0.212	0.48	0.18	1.6	94	10	306.1	3	0	0	52	1015	6
5	3	7	66	12	137	0.243	1.825	0.017	1608	276	-9.5	0.212	0.48	0.18	1.7	88	10	306.4	3	0	0	50	1014	7
5	3	7	66	13	96.8	-9	-9	-9	1650	-999	-99999	0.475	0.6	0.17	0	0	10	305.6	3	0	0	54	1014	9
5	3	7	66	14	86	0.251	1.587	0.017	1681	289	-16.6	0.212	0.48	0.18	1.9	97	10	305.6	3	0	0	51	1013	9
5	3	7	66	15	101.9	0.312	1.682	0.016	1688	401	-26.9	0.212	0.48	0.18	2.5	104	10	305.4	3	0	0	52	1012	8
5	3	7	66	16	30.8	0.267	1.129	0.016	1689	318	-56	0.212	0.48	0.19	2.3	92	10	303.4	3	0	0	56	1013	10
5	3	7	66	17	13.3	0.255	0.853	0.016	1690	297	-113.5	0.212	0.48	0.23	2.3	94	10	302.1	3	0	0	55	1013	10
5	3	7	66	18	0.1	0.25	0.168	0.016	1689	288	-8888	0.562	0.7	0.38	1.8	83	10	300.8	3	0	0	67	1013	3
5	3	7	66	19	-5.1	0.083	-9	-9	-999	84	10.4	0.562	0.7	1	1.2	78	10	299.6	3	0	0	68	1014	3
5	3	7	66	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	74	10	298.9	3	0	0	69	1015	3
5	3	7	66	21	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	75	10	298.2	3	0	0	73	1015	3
5	3	7	66	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	82	10	297.4	3	0	0	77	1015	99
5	3	7	66	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	98	10	297	3	0	0	82	1015	3
5	3	7	66	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	98	10	296.8	3	0	0	83	1014	3
5	3	8	67	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	95	10	296.4	3	0	0	85	1014	99
5	3	8	67	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	74	10	296.1	3	0	0	87	1013	3
5	3	8	67	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	296.4	3	0	0	92	1013	3
5	3	8	67	4	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	79	10	296.5	3	0	0	97	1013	3
5	3	8	67	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	89	10	296.4	3	0	0	90	1014	0
5	3	8	67	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	296.9	3	0	0	90	1014	3
5	3	8	67	7	-2.2	0.056	-9	-9	-999	30	7	0.562	0.7	0.65	0.8	67	10	299.4	3	0	0	90	1015	0
5	3	8	67	8	74.5	0.218	0.761	0.006	214	234	-12.6	0.562	0.7	0.29	1.1	39	10	302.1	3	0	0	79	1016	0
5	3	8	67	9	116.5	0.269	1.079	0.006	391	320	-15.1	0.562	0.7	0.2	1.4	74	10	304	3	0	0	63	1016	0
5	3	8	67	10	50.5	0.182	0.866	0.006	467	181	-10.9	0.562	0.7	0.18	0.9	8	10	303	3	0	0	44	1016	10
5	3	8	67	11	29.3	0.144	0.745	0.006	511	126	-9.2	0.212	0.48	0.18	1	87	10	302.6	3	0	0	45	1015	10
5	3	8	67	12	71.4	0.169	1.069	0.005	620	160	-6.1	0.212	0.48	0.18	1.1	118	10	303.2	3	0	0	48	1014	9
5	3	8	67	13	77	0.319	1.161	0.005	735	414	-38	0.562	0.7	0.18	1.9	78	10	302.4	3	0	0	67	1014	10
5	3	8	67	14	47.4	0.257	1.017	0.005	801	300	-32.2	0.562	0.7	0.18	1.5	74	10	300.4	3	0	0	61	1014	10
5	3	8	67	15	49.4	0.248	1.045	0.005	835	285	-28	0.212	0.48	0.18	2	89	10	301	3	0	0	67	1013	10
5	3	8	67	16	19.5	0.201	0.769	0.005	846	208	-37.9	0.562	0.7	0.19	1.2	67	10	298.4	3	0	0	94	1013	10
5	3	8	67	17	7.8	0.187	0.569	0.005	851	187	-76.2	0.562	0.7	0.22	1.2	61	10	298.6	3	0	0	77	1013	10
5	3	8	67	18	0.1	0.167	0.133	0.005	850	157	-4232.2	0.562	0.7	0.38	1.2	62	10	297.9	3	0	0	82	1014	7
5	3	8	67	19	-2	0.056	-9	-9	-999	40	7.7	0.562	0.7	1	0.8	70	10	297.4	3	0	0	85	1014	7
5	3	8	67	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	124	10	297.4	3	0	0	87	1014	7
5	3	8	67	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	78	10	297.6	3	0	0	90	1015	3
5	3	8	67	22	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	40	10	297.4	3	0	0	94	1015	0
5	3	8	67	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.4	3	0	0	94	1015	7
5	3	8	67	24	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	97	10	297.2	3	0	0	94	1014	7
5	3	9	68	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	296.9	3	0	0	97	1013	3
5	3	9	68	2	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	105	10	296.4	3	0	0	97	1013	3
5	3	9	68	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	108	10	296	3	0	0	97	1013	3
5	3	9	68	4	-3.1	0.069	-9	-9	-999	42	9.6	0.562	0.7	1	1	71	10	295.8	3	0	0	97	1013	7
5	3	9	68	5	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	295.4	3	0	0	93	1013	7
5	3	9	68	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	85	10	295.5	3	0	0	93	1014	7
5	3	9	68	7	-3.5	0.069	-9	-9	-999	42	8.7	0.562	0.7	0.64	1	80	10	298.1	3	0	0	93	1015	0
5	3	9	68	8	58.4	0.214	-9	-9	-999	228	-15.2	0.212	0.48	0.29	1.6	109	10	301.4	3	0	0	74	1015	0
5	3	9	68	9	108.8	0.257	-9	-9	-999	299	-14.1	0.212	0.48	0.2	1.9	107	10	303.5	3	0	0	63	1016	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	9	68	10	131.7	0.262	-9	-9	-999	308	-12.4	0.212	0.48	0.18	1.9	108	10	304.9	3	0	0	55	1016	0
5	3	9	68	11	154.2	0.246	-9	-9	-999	281	-8.8	0.212	0.48	0.18	1.7	128	10	305.5	3	0	0	45	1015	5
5	3	9	68	12	153.4	0.227	-9	-9	-999	249	-6.9	0.212	0.48	0.18	1.5	112	10	306.2	3	0	0	44	1014	7
5	3	9	68	13	144.6	0.225	-9	-9	-999	246	-7.2	0.212	0.48	0.18	1.5	113	10	306.5	3	0	0	44	1013	7
5	3	9	68	14	84.7	0.203	-9	-9	-999	210	-8.9	0.212	0.48	0.18	1.4	110	10	306	3	0	0	43	1012	9
5	3	9	68	15	72.1	0.217	-9	-9	-999	233	-12.8	0.562	0.7	0.18	1.1	356	10	303.9	3	0	0	49	1012	10
5	3	9	68	16	46.5	0.206	-9	-9	-999	216	-17	0.562	0.7	0.19	1.1	345	10	303.2	3	0	0	52	1012	10
5	3	9	68	17	1.9	0.124	-9	-9	-999	102	-87.9	0.212	0.48	0.23	1.1	115	10	302	3	0	0	52	1012	10
5	3	9	68	18	0.1	0.136	-9	-9	-999	115	-2245.5	0.212	0.48	0.38	1.3	118	10	300.5	3	0	0	63	1012	7
5	3	9	68	19	-3.3	0.062	-9	-9	-999	37	6.7	0.212	0.48	1	1.2	114	10	299.2	3	0	0	69	1012	3
5	3	9	68	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	108	10	298.2	3	0	0	74	1013	7
5	3	9	68	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	106	10	297.8	3	0	0	79	1013	3
5	3	9	68	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	297.4	3	0	0	85	1013	3
5	3	9	68	23	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	90	10	297.4	3	0	0	85	1013	3
5	3	9	68	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	297.4	3	0	0	85	1013	3
5	3	10	69	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	297.6	3	0	0	85	1012	3
5	3	10	69	2	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	108	10	297.4	3	0	0	90	1011	7
5	3	10	69	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	296.8	3	0	0	88	1011	3
5	3	10	69	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	71	10	296.4	3	0	0	90	1010	3
5	3	10	69	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	296.4	3	0	0	93	1011	3
5	3	10	69	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	85	10	296.9	3	0	0	90	1012	7
5	3	10	69	7	-2.2	0.052	-9	-9	-999	27	5.7	0.212	0.48	0.64	1	112	10	299.9	3	0	0	90	1013	0
5	3	10	69	8	53.5	0.212	0.675	0.005	207	225	-16.2	0.212	0.48	0.28	1.6	129	10	301.8	3	0	0	82	1014	0
5	3	10	69	9	103	0.236	1.076	0.005	438	264	-11.6	0.212	0.48	0.2	1.7	125	10	303.4	3	0	0	70	1014	0
5	3	10	69	10	136.1	0.243	1.409	0.005	744	276	-9.5	0.212	0.48	0.18	1.7	125	10	304.8	3	0	0	67	1014	0
5	3	10	69	11	121.5	0.23	1.443	0.005	896	254	-9.1	0.212	0.48	0.18	1.6	125	10	305.4	3	0	0	52	1014	8
5	3	10	69	12	119.1	-9	-9	-9	1026	-999	-99999	0.475	0.6	0.17	0	0	10	305.1	3	0	0	56	1013	9
5	3	10	69	13	33.4	0.209	0.994	0.005	1060	220	-24.7	0.24	0.3	0.16	1.6	322	10	303.4	3	0	0	52	1012	10
5	3	10	69	14	86.7	0.334	1.404	0.005	1154	445	-38.9	0.562	0.7	0.18	2	337	10	302.9	3	0	0	49	1011	9
5	3	10	69	15	52.2	0.333	1.205	0.005	1210	443	-64	0.562	0.7	0.18	2.1	342	10	302.4	3	0	0	52	1011	10
5	3	10	69	16	21.2	0.265	0.898	0.005	1231	315	-78.7	0.562	0.7	0.19	1.7	348	10	301.6	3	0	0	55	1011	10
5	3	10	69	17	9.5	0.128	0.689	0.005	1242	117	-20	0.562	0.7	0.22	0.7	356	10	301.8	3	0	0	59	1011	10
5	3	10	69	18	0.1	0.074	0.151	0.005	1239	47	-372.1	0.212	0.48	0.38	0.7	101	10	300.9	3	0	0	66	1011	7
5	3	10	69	19	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	105	10	299.8	3	0	0	74	1012	7
5	3	10	69	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	104	10	298.8	3	0	0	79	1013	0
5	3	10	69	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	298.2	3	0	0	82	1013	7
5	3	10	69	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	75	10	298.4	3	0	0	82	1014	7
5	3	10	69	23	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	298.2	3	0	0	85	1014	7
5	3	10	69	24	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	78	10	297.9	3	0	0	82	1014	3
5	3	11	70	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	88	10	297.4	3	0	0	88	1013	3
5	3	11	70	2	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	107	10	296.9	3	0	0	90	1013	3
5	3	11	70	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	111	10	296.9	3	0	0	90	1013	3
5	3	11	70	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	296.9	3	0	0	94	1013	7
5	3	11	70	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	47	10	296.9	3	0	0	97	1013	7
5	3	11	70	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	296.9	3	0	0	94	1013	3
5	3	11	70	7	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	0.63	0.8	101	10	298.8	3	0	0	94	1014	0
5	3	11	70	8	34.7	0.166	0.614	0.005	241	156	-12	0.212	0.48	0.28	1.2	101	10	301.2	3	0	0	82	1015	3
5	3	11	70	9	86.9	0.213	1.117	0.005	581	226	-10	0.212	0.48	0.2	1.5	102	10	302.4	3	0	0	78	1015	2
5	3	11	70	10	115.5	0.229	1.378	0.005	821	252	-9.4	0.212	0.48	0.18	1.6	116	10	304	3	0	0	74	1015	6

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	11	70	11	122.4	0.25	1.453	0.005	909	288	-11.6	0.212	0.48	0.18	1.8	136	10	304.4	3	0	0	70	1015	7
5	3	11	70	12	112.5	0.248	1.455	0.005	991	285	-12.3	0.212	0.48	0.18	1.8	120	10	304.9	3	0	0	66	1014	8
5	3	11	70	13	75.3	0.22	1.296	0.005	1046	237	-12.7	0.212	0.48	0.18	1.6	122	10	305.1	3	0	0	62	1013	9
5	3	11	70	14	49.6	0.182	1.141	0.005	1081	179	-11	0.212	0.48	0.18	1.3	118	10	304.4	3	0	0	70	1012	10
5	3	11	70	15	16	0.119	0.785	0.005	1090	95	-9.6	0.24	0.3	0.16	0.8	325	10	303	3	0	0	70	1011	10
5	3	11	70	16	12.8	0.142	0.732	0.005	1099	123	-20	0.212	0.48	0.19	1.1	111	10	302.9	3	0	0	70	1011	10
5	3	11	70	17	3.4	0.185	0.471	0.005	1100	183	-168.2	0.212	0.48	0.23	1.7	112	10	302.1	3	0	0	70	1012	10
5	3	11	70	18	0.1	0.125	0.145	0.005	1098	103	-1772.9	0.212	0.48	0.38	1.2	113	10	300.8	3	0	0	78	1012	7
5	3	11	70	19	-1.8	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	109	10	299.9	3	0	0	86	1013	99
5	3	11	70	20	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	78	10	299.5	3	0	0	94	1013	7
5	3	11	70	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	298.9	3	0	0	999	1014	7
5	3	11	70	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	95	10	298.4	3	0	0	999	1014	99
5	3	11	70	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	103	10	297.9	3	0	0	999	1014	99
5	3	11	70	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	95	10	298	3	0	0	999	1014	99
5	3	12	71	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	107	10	297.9	3	0	0	999	1014	99
5	3	12	71	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	297.6	3	0	0	94	1013	3
5	3	12	71	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	115	10	297.5	3	0	0	94	1013	3
5	3	12	71	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	77	10	297.4	3	0	0	94	1013	99
5	3	12	71	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	54	10	296.8	3	0	0	94	1013	0
5	3	12	71	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	45	10	297.2	3	0	0	90	1014	99
5	3	12	71	7	-1.8	0.047	-9	-9	-999	23	5.2	0.212	0.48	0.62	0.9	89	10	300.6	3	0	0	86	1015	0
5	3	12	71	8	60.8	0.271	0.837	0.005	349	325	-29.8	0.212	0.48	0.28	2.2	125	10	302.6	3	0	0	82	1015	0
5	3	12	71	9	93.1	0.29	1.18	0.005	639	360	-23.8	0.212	0.48	0.2	2.3	124	10	303.9	3	0	0	70	1016	0
5	3	12	71	10	132.1	0.318	1.484	0.005	898	413	-22.1	0.212	0.48	0.18	2.5	136	10	304.9	3	0	0	59	1016	4
5	3	12	71	11	139.3	0.31	1.592	0.005	1051	398	-19.5	0.212	0.48	0.18	2.4	120	10	305.4	3	0	0	59	1016	6
5	3	12	71	12	132.1	0.318	1.633	0.005	1196	413	-22.1	0.212	0.48	0.18	2.5	118	10	305.4	3	0	0	61	1015	8
5	3	12	71	13	142.8	0.311	1.748	0.006	1354	399	-19.1	0.212	0.48	0.18	2.4	123	10	306	3	0	0	56	1014	7
5	3	12	71	14	109.7	0.285	1.647	0.011	1474	351	-19.1	0.212	0.48	0.18	2.2	112	10	305.5	3	0	0	56	1014	8
5	3	12	71	15	97.5	0.273	1.615	0.01	1563	328	-18.8	0.212	0.48	0.18	2.1	111	10	305.4	3	0	0	49	1013	8
5	3	12	71	16	60.9	0.243	1.388	0.01	1586	276	-21.3	0.212	0.48	0.19	1.9	101	10	304.9	3	0	0	49	1013	9
5	3	12	71	17	20.8	0.214	0.971	0.01	1592	228	-42.7	0.212	0.48	0.22	1.8	106	10	303.1	3	0	0	50	1013	10
5	3	12	71	18	0.1	0.136	0.164	0.01	1588	116	-2250	0.212	0.48	0.38	1.3	114	10	300.5	3	0	0	55	1014	3
5	3	12	71	19	-1.5	0.042	-9	-9	-999	27	4.5	0.212	0.48	1	0.8	109	10	299	3	0	0	65	1014	3
5	3	12	71	20	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	101	10	298	3	0	0	69	1015	0
5	3	12	71	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	103	10	297.1	3	0	0	75	1015	99
5	3	12	71	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	77	10	296.5	3	0	0	81	1015	99
5	3	12	71	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	65	10	296.2	3	0	0	87	1015	3
5	3	12	71	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	58	10	295.5	3	0	0	88	1015	3
5	3	13	72	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	74	10	295.4	3	0	0	89	1014	99
5	3	13	72	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	101	10	294.9	3	0	0	90	1014	3
5	3	13	72	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	295	3	0	0	95	1014	3
5	3	13	72	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	295.1	3	0	0	100	1014	3
5	3	13	72	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	295.1	3	0	0	97	1014	3
5	3	13	72	6	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	103	10	295.8	3	0	0	87	1014	7
5	3	13	72	7	-4.1	0.076	-9	-9	-999	49	9.8	0.562	0.7	0.62	1.1	79	10	300	3	0	0	90	1015	0
5	3	13	72	8	77.1	0.269	0.877	0.005	316	322	-23	0.562	0.7	0.28	1.5	85	10	302	3	0	0	77	1015	0
5	3	13	72	9	88.9	0.252	1.081	0.005	515	291	-16.3	0.212	0.48	0.2	1.9	100	10	303.4	3	0	0	59	1016	2
5	3	13	72	10	121.8	0.25	1.384	0.005	789	287	-11.6	0.212	0.48	0.18	1.8	96	10	304.5	3	0	0	59	1016	6
5	3	13	72	11	152.5	0.266	1.62	0.005	1012	315	-11.1	0.212	0.48	0.18	1.9	107	10	305.2	3	0	0	54	1015	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	13	72	12	153.2	0.295	1.734	0.005	1232	368	-15.1	0.212	0.48	0.18	2.2	104	10	305.9	3	0	0	50	1014	7
5	3	13	72	13	150.6	0.304	1.82	0.005	1450	385	-16.8	0.212	0.48	0.18	2.3	122	10	306.5	3	0	0	50	1013	7
5	3	13	72	14	105.4	0.266	1.652	0.009	1548	315	-16	0.212	0.48	0.18	2	107	10	305.8	3	0	0	51	1012	8
5	3	13	72	15	84.2	0.251	1.545	0.01	1583	289	-16.9	0.212	0.48	0.18	1.9	116	10	305.4	3	0	0	54	1012	9
5	3	13	72	16	40.2	0.235	1.214	0.011	1603	262	-29.1	0.212	0.48	0.19	1.9	114	10	304.6	3	0	0	52	1011	10
5	3	13	72	17	6.4	0.229	0.658	0.011	1603	252	-168.8	0.212	0.48	0.22	2.1	114	10	302.5	3	0	0	59	1012	10
5	3	13	72	18	0.1	0.177	0.165	0.011	1599	172	-4987.1	0.212	0.48	0.38	1.7	104	10	300.6	3	0	0	63	1012	3
5	3	13	72	19	-4.4	0.073	-9	-9	-999	51	7.8	0.212	0.48	1	1.4	104	10	299.6	3	0	0	72	1012	3
5	3	13	72	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	92	10	299	3	0	0	77	1013	0
5	3	13	72	21	-5.9	0.09	-9	-9	-999	62	11.2	0.562	0.7	1	1.3	81	10	298.5	3	0	0	79	1013	3
5	3	13	72	22	-7.9	0.104	-9	-9	-999	77	12.9	0.562	0.7	1	1.5	76	10	297.9	3	0	0	79	1014	3
5	3	13	72	23	-4.4	0.076	-9	-9	-999	49	9.2	0.562	0.7	1	1.1	81	10	296.9	3	0	0	82	1014	0
5	3	13	72	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	108	10	296.4	3	0	0	79	1013	3
5	3	14	73	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	296.5	3	0	0	90	1013	3
5	3	14	73	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	296.9	3	0	0	87	1013	7
5	3	14	73	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	120	10	296.5	3	0	0	90	1012	3
5	3	14	73	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	91	10	296.4	3	0	0	999	1012	3
5	3	14	73	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	85	10	295.9	3	0	0	999	1013	99
5	3	14	73	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.6	96	10	296.4	3	0	0	999	1013	99
5	3	14	73	7	-3.4	0.069	-9	-9	-999	42	9	0.562	0.7	0.61	1	76	10	299.6	3	0	0	999	1014	0
5	3	14	73	8	62	0.243	1.115	0.005	810	276	-21	0.212	0.48	0.28	1.9	88	10	301.8	3	0	0	74	1014	0
5	3	14	73	9	137	0.349	1.538	0.005	962	474	-28.1	0.562	0.7	0.2	2	80	10	303.8	3	0	0	63	1015	0
5	3	14	73	10	145.4	0.235	1.653	0.005	1125	269	-8.1	0.212	0.48	0.18	1.6	87	10	305.2	3	0	0	42	1014	0
5	3	14	73	11	160.4	0.218	1.795	0.006	1305	234	-5.8	0.212	0.48	0.18	1.4	94	10	306	3	0	0	42	1013	5
5	3	14	73	12	171.6	0.209	1.923	0.01	1500	220	-4.8	0.212	0.48	0.18	1.3	92	10	307	3	0	0	41	1012	5
5	3	14	73	13	122.3	0.17	1.74	0.01	1558	161	-3.6	0.212	0.48	0.18	1	88	10	306.5	3	0	0	40	1012	8
5	3	14	73	14	54.3	0.184	1.332	0.01	1569	181	-10.3	0.562	0.7	0.18	0.9	9	10	305.5	3	0	0	42	1010	10
5	3	14	73	15	49.8	0.182	1.297	0.01	1580	179	-10.9	0.562	0.7	0.18	0.9	26	10	304.5	3	0	0	44	1010	10
5	3	14	73	16	20.7	0.196	0.969	0.01	1584	199	-32.5	0.212	0.48	0.19	1.6	88	10	303.9	3	0	0	41	1010	10
5	3	14	73	17	13.6	0.199	0.842	0.01	1586	204	-52.1	0.212	0.48	0.22	1.7	103	10	302.8	3	0	0	52	1010	10
5	3	14	73	18	0.1	0.197	0.164	0.01	1584	202	-6943.7	0.212	0.48	0.38	1.9	87	10	300.9	3	0	0	63	1011	3
5	3	14	73	19	-5.1	0.078	-9	-9	-999	59	8.4	0.212	0.48	1	1.5	88	10	299.4	3	0	0	65	1012	3
5	3	14	73	20	-5.2	0.083	-9	-9	-999	55	10.1	0.562	0.7	1	1.2	70	10	298.4	3	0	0	69	1012	0
5	3	14	73	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	90	10	297.5	3	0	0	69	1013	3
5	3	14	73	22	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	85	10	297	3	0	0	74	1013	3
5	3	14	73	23	-4.4	0.076	-9	-9	-999	49	9.2	0.562	0.7	1	1.1	65	10	296.5	3	0	0	84	1013	0
5	3	14	73	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	52	10	295.6	3	0	0	74	1012	3
5	3	15	74	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	295.2	3	0	0	79	1012	3
5	3	15	74	2	-0.8	0.031	-9	-9	-999	13	3.2	0.212	0.48	1	0.6	120	10	295.2	3	0	0	76	1011	0
5	3	15	74	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	93	10	295.1	3	0	0	87	1011	3
5	3	15	74	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	295.1	3	0	0	87	1011	3
5	3	15	74	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	88	10	295	3	0	0	90	1012	0
5	3	15	74	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	296.1	3	0	0	87	1012	3
5	3	15	74	7	-4.1	0.076	-9	-9	-999	49	9.9	0.562	0.7	0.61	1.1	76	10	299.8	3	0	0	84	1013	0
5	3	15	74	8	79.2	0.319	1.055	0.005	536	415	-37.2	0.562	0.7	0.28	1.9	76	10	302	3	0	0	65	1013	0
5	3	15	74	9	139	0.312	1.479	0.009	842	400	-19.7	0.562	0.7	0.2	1.7	75	10	303.9	3	0	0	58	1014	0
5	3	15	74	10	133.7	0.223	1.512	0.009	935	246	-7.5	0.212	0.48	0.18	1.5	92	10	305.1	3	0	0	52	1014	3
5	3	15	74	11	218.5	0.219	1.861	0.01	1067	235	-4.3	0.562	0.7	0.18	0.9	21	10	305.9	3	0	0	44	1013	0
5	3	15	74	12	216.4	0.415	1.901	0.009	1149	614	-29.7	0.562	0.7	0.18	2.4	336	10	304.4	3	0	0	44	1012	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	15	74	13	176.7	0.371	1.811	0.008	1215	520	-26	0.562	0.7	0.18	2.1	336	10	304.4	3	0	0	47	1011	7
5	3	15	74	14	129.3	0.335	1.651	0.008	1256	446	-26.2	0.562	0.7	0.18	1.9	342	10	304.2	3	0	0	47	1010	9
5	3	15	74	15	154.3	0.328	1.775	0.008	1308	432	-20.6	0.562	0.7	0.18	1.8	346	10	305.6	3	0	0	49	1010	7
5	3	15	74	16	50.6	0.173	1.229	0.008	1323	180	-9.2	0.212	0.48	0.19	1.2	88	10	304.9	3	0	0	51	1010	9
5	3	15	74	17	4.8	0.233	0.559	0.008	1321	259	-239.6	0.562	0.7	0.22	1.6	84	10	302.9	3	0	0	53	1011	10
5	3	15	74	18	0.1	0.156	0.154	0.008	1319	143	-3434.2	0.212	0.48	0.38	1.5	86	10	301.2	3	0	0	59	1012	7
5	3	15	74	19	-6.1	0.097	-9	-9	-999	70	13.6	0.562	0.7	1	1.4	84	10	299.8	3	0	0	65	1012	7
5	3	15	74	20	-7.9	0.104	-9	-9	-999	77	12.9	0.562	0.7	1	1.5	79	10	298.8	3	0	0	74	1013	3
5	3	15	74	21	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	75	10	298	3	0	0	74	1014	3
5	3	15	74	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1.2	83	10	297	3	0	0	75	1014	99
5	3	15	74	23	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	78	10	296.6	3	0	0	76	1014	0
5	3	15	74	24	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	78	10	295.8	3	0	0	78	1014	0
5	3	16	75	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	57	10	295.4	3	0	0	81	1013	99
5	3	16	75	2	-2.9	0.063	-9	-9	-999	36	7.5	0.562	0.7	1	0.9	72	10	295.2	3	0	0	84	1013	0
5	3	16	75	3	-2.9	0.063	-9	-9	-999	36	7.5	0.562	0.7	1	0.9	70	10	295.4	3	0	0	85	1013	0
5	3	16	75	4	-2.9	0.063	-9	-9	-999	36	7.5	0.562	0.7	1	0.9	66	10	295.2	3	0	0	87	1013	0
5	3	16	75	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	76	10	294.8	3	0	0	90	1013	0
5	3	16	75	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	295.5	3	0	0	87	1013	7
5	3	16	75	7	-2.6	0.057	-9	-9	-999	31	6.4	0.212	0.48	0.6	1.1	88	10	298.9	3	0	0	78	1014	0
5	3	16	75	8	77.4	0.282	0.817	0.007	255	344	-26.2	0.562	0.7	0.27	1.6	80	10	301.4	3	0	0	69	1015	0
5	3	16	75	9	138.9	0.337	1.285	0.006	553	450	-25	0.562	0.7	0.2	1.9	72	10	303.5	3	0	0	55	1015	0
5	3	16	75	10	152.9	0.227	1.438	0.005	704	254	-6.9	0.212	0.48	0.18	1.5	88	10	305.4	3	0	0	52	1015	0
5	3	16	75	11	164.9	0.187	1.549	0.005	817	186	-3.6	0.212	0.48	0.18	1.1	108	10	306.8	3	0	0	45	1014	0
5	3	16	75	12	104.8	0.113	1.372	0.005	892	88	-1.2	0.24	0.3	0.16	0.5	329	10	306.9	3	0	0	44	1013	7
5	3	16	75	13	182.4	0.408	1.94	0.01	1449	600	-33.7	0.562	0.7	0.18	2.4	334	10	304.4	3	0	0	43	1013	7
5	3	16	75	14	175	0.382	1.938	0.01	1503	545	-28.8	0.562	0.7	0.18	2.2	341	10	304.8	3	0	0	43	1012	7
5	3	16	75	15	148.4	0.34	1.849	0.009	1539	456	-23.8	0.562	0.7	0.18	1.9	344	10	305.2	3	0	0	44	1011	7
5	3	16	75	16	54	-9	-9	-9	1550	-999	-99999	0.475	0.6	0.18	0	0	10	304.9	3	0	0	45	1011	10
5	3	16	75	17	3.7	0.176	0.542	0.009	1549	170	-133.5	0.212	0.48	0.22	1.6	116	10	302.8	3	0	0	52	1012	10
5	3	16	75	18	0.1	0.136	0.163	0.009	1547	115	-2246.3	0.212	0.48	0.38	1.3	98	10	300.8	3	0	0	59	1012	3
5	3	16	75	19	-3.8	0.067	-9	-9	-999	41	7.2	0.212	0.48	1	1.3	97	10	299	3	0	0	65	1013	3
5	3	16	75	20	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	86	10	297.9	3	0	0	72	1013	3
5	3	16	75	21	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	84	10	297	3	0	0	74	1014	3
5	3	16	75	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	88	10	296.9	3	0	0	76	1014	99
5	3	16	75	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	296.2	3	0	0	79	1014	3
5	3	16	75	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	99	10	295.9	3	0	0	82	1013	3
5	3	17	76	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1	84	10	295.9	3	0	0	86	1013	99
5	3	17	76	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	89	10	295.9	3	0	0	90	1012	3
5	3	17	76	3	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	80	10	295.6	3	0	0	999	1012	3
5	3	17	76	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	76	10	295.4	3	0	0	999	1013	99
5	3	17	76	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	88	10	295.4	3	0	0	999	1013	99
5	3	17	76	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	99	10	295.8	3	0	0	999	1014	99
5	3	17	76	7	-4.2	0.073	-9	-9	-999	45	8.2	0.212	0.48	0.59	1.4	106	10	299.4	3	0	0	999	1015	0
5	3	17	76	8	63.9	0.3	0.808	0.005	299	379	-38.4	0.212	0.48	0.27	2.5	104	10	302	3	0	0	69	1015	0
5	3	17	76	9	110.9	0.304	1.226	0.005	602	386	-23	0.212	0.48	0.2	2.4	92	10	303.9	3	0	0	63	1016	0
5	3	17	76	10	145.5	0.274	1.519	0.005	873	331	-12.8	0.212	0.48	0.18	2	93	10	305.4	3	0	0	48	1016	0
5	3	17	76	11	164.7	0.258	1.664	0.005	1013	301	-9.4	0.212	0.48	0.18	1.8	94	10	306.4	3	0	0	42	1015	0
5	3	17	76	12	167.2	0.268	1.747	0.005	1156	319	-10.4	0.212	0.48	0.18	1.9	88	10	306.9	3	0	0	41	1014	6
5	3	17	76	13	147.7	0.275	1.735	0.005	1281	331	-12.7	0.212	0.48	0.18	2	112	10	306.6	3	0	0	39	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	17	76	14	98.3	0.235	1.547	0.005	1364	263	-12	0.212	0.48	0.18	1.7	105	10	306.2	3	0	0	38	1013	9
5	3	17	76	15	57.4	0.242	1.309	0.005	1410	273	-22.2	0.212	0.48	0.18	1.9	93	10	305.4	3	0	0	37	1012	10
5	3	17	76	16	20.9	0.223	0.938	0.005	1425	243	-48.2	0.212	0.48	0.19	1.9	107	10	304.2	3	0	0	42	1012	10
5	3	17	76	17	15	0.238	0.842	0.005	1434	267	-80.8	0.212	0.48	0.22	2.1	109	10	302.9	3	0	0	50	1012	10
5	3	17	76	18	0.1	0.177	0.158	0.005	1428	172	-4990.5	0.212	0.48	0.38	1.7	104	10	300.8	3	0	0	59	1013	7
5	3	17	76	19	-2	0.052	-9	-9	-999	44	6.3	0.212	0.48	1	1	95	10	299.4	3	0	0	69	1013	7
5	3	17	76	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	95	10	298.4	3	0	0	74	1014	0
5	3	17	76	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	100	10	297.6	3	0	0	75	1014	99
5	3	17	76	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	102	10	297.1	3	0	0	77	1014	99
5	3	17	76	23	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	88	10	296.9	3	0	0	79	1014	0
5	3	17	76	24	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	92	10	296.4	3	0	0	80	1013	0
5	3	18	77	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	106	10	296	3	0	0	81	1013	99
5	3	18	77	2	-0.6	0.026	-9	-9	-999	10	2.7	0.212	0.48	1	0.5	92	10	296	3	0	0	82	1013	0
5	3	18	77	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	96	10	296	3	0	0	79	1012	3
5	3	18	77	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	296	3	0	0	82	1013	3
5	3	18	77	5	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	43	10	295.6	3	0	0	85	1013	3
5	3	18	77	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	94	10	296.9	3	0	0	999	1014	3
5	3	18	77	7	-3.1	0.062	-9	-9	-999	36	7.2	0.212	0.48	0.59	1.2	100	10	300.9	3	0	0	999	1015	0
5	3	18	77	8	60.4	0.243	1.124	0.005	853	275	-21.5	0.212	0.48	0.27	1.9	113	10	302.5	3	0	0	999	1015	0
5	3	18	77	9	82.3	0.269	1.281	0.006	927	320	-21.3	0.212	0.48	0.2	2.1	117	10	303.4	3	0	0	999	1016	6
5	3	18	77	10	108.4	0.257	1.454	0.005	1029	299	-14.1	0.212	0.48	0.18	1.9	119	10	304.4	3	0	0	999	1015	7
5	3	18	77	11	70.4	0.218	1.287	0.005	1097	235	-13.3	0.212	0.48	0.18	1.6	119	10	304.4	3	0	0	999	1015	9
5	3	18	77	12	115.7	0.22	1.57	0.005	1212	237	-8.3	0.212	0.48	0.18	1.5	103	10	305.4	3	0	0	999	1014	8
5	3	18	77	13	90.5	0.223	1.464	0.005	1256	243	-11.1	0.212	0.48	0.18	1.6	100	10	305.5	3	0	0	999	1013	9
5	3	18	77	14	46.9	0.191	1.183	0.005	1276	192	-13.4	0.212	0.48	0.18	1.4	104	10	304.9	3	0	0	47	1013	10
5	3	18	77	15	29.9	0.211	1.022	0.005	1289	223	-28.3	0.212	0.48	0.18	1.7	98	10	303.9	3	0	0	999	1012	10
5	3	18	77	16	24.9	0.208	0.965	0.005	1300	218	-32.5	0.212	0.48	0.19	1.7	111	10	303.4	3	0	0	999	1012	10
5	3	18	77	17	13.4	0.198	0.785	0.005	1305	203	-52.8	0.212	0.48	0.22	1.7	103	10	302.4	3	0	0	999	1013	10
5	3	18	77	18	0.1	0.166	0.154	0.005	1303	156	-4167	0.212	0.48	0.38	1.6	107	10	300.4	3	0	0	59	1013	3
5	3	18	77	19	-3.8	0.067	-9	-9	-999	45	7.2	0.212	0.48	1	1.3	106	10	299.2	3	0	0	66	1013	3
5	3	18	77	20	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	89	10	298.4	3	0	0	74	1014	3
5	3	18	77	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	86	10	298	3	0	0	74	1015	3
5	3	18	77	22	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	87	10	297.5	3	0	0	74	1015	3
5	3	18	77	23	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	83	10	296.9	3	0	0	79	1014	0
5	3	18	77	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	296.4	3	0	0	84	1014	3
5	3	19	78	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	296.2	3	0	0	90	1013	3
5	3	19	78	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	63	10	295.9	3	0	0	85	1013	3
5	3	19	78	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	37	10	295.6	3	0	0	85	1013	3
5	3	19	78	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	32	10	295.5	3	0	0	90	1014	3
5	3	19	78	5	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	68	10	295.4	3	0	0	90	1014	3
5	3	19	78	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	296.2	3	0	0	97	1015	7
5	3	19	78	7	-2.7	0.063	-9	-9	-999	36	8.3	0.562	0.7	0.58	0.9	84	10	299.6	3	0	0	90	1015	0
5	3	19	78	8	59.1	0.242	1.066	0.008	743	274	-21.8	0.212	0.48	0.27	1.9	111	10	302.4	3	0	0	72	1016	0
5	3	19	78	9	109.8	0.276	1.341	0.01	797	333	-17.3	0.212	0.48	0.2	2.1	111	10	304.4	3	0	0	63	1016	0
5	3	19	78	10	145.7	0.284	1.563	0.011	951	348	-14.2	0.212	0.48	0.18	2.1	119	10	305.5	3	0	0	56	1015	0
5	3	19	78	11	142.8	0.274	1.589	0.01	1019	329	-13	0.212	0.48	0.18	2	112	10	306.4	3	0	0	49	1015	6
5	3	19	78	12	128.1	0.28	1.564	0.009	1082	341	-15.5	0.212	0.48	0.18	2.1	124	10	306.2	3	0	0	50	1014	8
5	3	19	78	13	125.3	0.28	1.58	0.009	1139	340	-15.7	0.212	0.48	0.18	2.1	133	10	306.6	3	0	0	54	1013	8
5	3	19	78	14	98.3	0.273	1.475	0.009	1181	328	-18.7	0.212	0.48	0.18	2.1	132	10	306.2	3	0	0	52	1012	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	19	78	15	84.5	0.279	1.417	0.009	1217	338	-23.1	0.212	0.48	0.18	2.2	136	10	306	3	0	0	54	1012	9
5	3	19	78	16	46.5	0.256	1.167	0.009	1236	299	-32.7	0.212	0.48	0.19	2.1	127	10	305.2	3	0	0	56	1012	10
5	3	19	78	17	8.1	0.221	0.653	0.009	1236	240	-120.7	0.212	0.48	0.22	2	115	10	303.1	3	0	0	59	1012	10
5	3	19	78	18	0.1	0.187	0.151	0.009	1234	186	-5916.4	0.212	0.48	0.38	1.8	108	10	301.2	3	0	0	70	1012	7
5	3	19	78	19	-4.5	0.073	-9	-9	-999	54	7.6	0.212	0.48	1	1.4	115	10	300.1	3	0	0	77	1013	0
5	3	19	78	20	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	115	10	299.4	3	0	0	85	1013	7
5	3	19	78	21	-4.4	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	112	10	299	3	0	0	88	1014	3
5	3	19	78	22	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	298.8	3	0	0	88	1014	3
5	3	19	78	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	79	10	298.2	3	0	0	91	1014	3
5	3	19	78	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	44	10	297.9	3	0	0	94	1014	3
5	3	20	79	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	22	10	297.2	3	0	0	94	1013	3
5	3	20	79	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.9	3	0	0	94	1013	0
5	3	20	79	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.8	3	0	0	94	1013	3
5	3	20	79	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.5	3	0	0	94	1013	3
5	3	20	79	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.5	3	0	0	97	1014	0
5	3	20	79	6	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	40	10	297.2	3	0	0	94	1014	3
5	3	20	79	7	-0.5	0.026	-9	-9	-999	10	3	0.212	0.48	0.58	0.5	100	10	300.8	3	0	0	94	1015	0
5	3	20	79	8	39.2	0.225	0.77	0.005	421	246	-26.3	0.212	0.48	0.27	1.8	128	10	302.1	3	0	0	999	1016	0
5	3	20	79	9	90.9	0.261	1.232	0.006	747	307	-17.8	0.212	0.48	0.2	2	126	10	304.2	3	0	0	999	1016	0
5	3	20	79	10	137.3	0.263	1.467	0.006	835	310	-12	0.212	0.48	0.18	1.9	125	10	306	3	0	0	999	1016	3
5	3	20	79	11	123.5	0.26	1.46	0.006	914	305	-12.9	0.212	0.48	0.18	1.9	123	10	306.2	3	0	0	999	1015	8
5	3	20	79	12	126.9	0.28	1.517	0.006	997	341	-15.6	0.212	0.48	0.18	2.1	126	10	306.8	3	0	0	999	1014	8
5	3	20	79	13	101.5	0.283	1.439	0.006	1062	347	-20.2	0.212	0.48	0.18	2.2	114	10	306.5	3	0	0	999	1013	9
5	3	20	79	14	111.6	0.295	1.518	0.006	1134	369	-20.8	0.212	0.48	0.18	2.3	123	10	306.1	3	0	0	49	1013	8
5	3	20	79	15	81.2	0.315	1.386	0.006	1185	407	-34.9	0.212	0.48	0.18	2.6	125	10	305.4	3	0	0	999	1013	9
5	3	20	79	16	64.4	0.427	1.296	0.006	1223	641	-108.8	0.687	0.8	0.19	2.6	154	10	303.6	3	0	0	999	1013	9
5	3	20	79	17	10.7	0.327	0.714	0.006	1227	435	-294.4	0.687	0.8	0.23	2.1	143	10	302.5	3	0	0	999	1013	10
5	3	20	79	18	4.2	-9	-9	-9	1227	-999	-99999	0.687	0.8	0.38	1.3	141	10	300.9	3	0	0	999	1013	99
5	3	20	79	19	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	110	10	299.9	3	0	0	74	1014	3
5	3	20	79	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	100	10	299.1	3	0	0	82	1014	0
5	3	20	79	21	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	80	10	298.4	3	0	0	82	1015	0
5	3	20	79	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	97	10	298.1	3	0	0	82	1015	3
5	3	20	79	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	101	10	297.9	3	0	0	85	1014	3
5	3	20	79	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	98	10	297.8	3	0	0	82	1014	3
5	3	21	80	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	74	10	297.6	3	0	0	82	1013	3
5	3	21	80	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	64	10	297.2	3	0	0	88	1013	3
5	3	21	80	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	59	10	297	3	0	0	88	1013	3
5	3	21	80	4	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	101	10	297	3	0	0	85	1013	3
5	3	21	80	5	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	297.1	3	0	0	94	1013	3
5	3	21	80	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	104	10	297.2	3	0	0	88	1014	3
5	3	21	80	7	-2.1	0.052	-9	-9	-999	27	6.1	0.212	0.48	0.57	1	87	10	300.4	3	0	0	82	1015	0
5	3	21	80	8	56.8	0.27	1.252	0.008	1253	322	-31.3	0.212	0.48	0.27	2.2	112	10	302.4	3	0	0	72	1015	0
5	3	21	80	9	95.1	0.347	1.497	0.008	1280	471	-39.9	0.212	0.48	0.2	2.9	112	10	303.9	3	0	0	59	1016	0
5	3	21	80	10	135.3	0.348	1.701	0.007	1319	471	-28.1	0.212	0.48	0.18	2.8	118	10	305.1	3	0	0	56	1016	3
5	3	21	80	11	148.5	0.35	1.773	0.006	1362	476	-26.1	0.212	0.48	0.18	2.8	114	10	305.9	3	0	0	56	1015	6
5	3	21	80	12	153.3	0.361	1.812	0.005	1407	498	-27.7	0.212	0.48	0.18	2.9	109	10	306.1	3	0	0	47	1015	7
5	3	21	80	13	140	0.329	1.775	0.005	1448	435	-23.1	0.212	0.48	0.18	2.6	109	10	306.2	3	0	0	47	1014	7
5	3	21	80	14	104	0.303	1.619	0.005	1477	383	-24.1	0.212	0.48	0.18	2.4	113	10	305.8	3	0	0	43	1013	9
5	3	21	80	15	88.1	0.289	1.541	0.005	1502	358	-24.8	0.212	0.48	0.18	2.3	108	10	304.2	3	0	0	49	1013	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	21	80	16	56.1	0.298	1.331	0.005	1521	373	-42.5	0.212	0.48	0.19	2.5	117	10	304	3	0	0	55	1013	9
5	3	21	80	17	14.9	0.257	0.856	0.005	1524	300	-102.8	0.212	0.48	0.22	2.3	114	10	302.5	3	0	0	63	1013	10
5	3	21	80	18	0.1	0.156	0.162	0.005	1522	146	-3439.9	0.212	0.48	0.38	1.5	109	10	300.9	3	0	0	63	1013	3
5	3	21	80	19	-2.3	0.052	-9	-9	-999	36	5.6	0.212	0.48	1	1	107	10	299.8	3	0	0	70	1014	3
5	3	21	80	20	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	91	10	298.9	3	0	0	77	1014	3
5	3	21	80	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	298.4	3	0	0	999	1015	3
5	3	21	80	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	88	10	298.5	3	0	0	999	1015	99
5	3	21	80	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	59	10	298.1	3	0	0	999	1015	99
5	3	21	80	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	22	10	297.6	3	0	0	999	1015	99
5	3	22	81	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	60	10	297.8	3	0	0	999	1015	99
5	3	22	81	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	56	10	297.9	3	0	0	91	1015	7
5	3	22	81	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	58	10	297.4	3	0	0	92	1014	7
5	3	22	81	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1.2	83	10	297.5	3	0	0	93	1014	99
5	3	22	81	5	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	83	10	297.6	3	0	0	94	1015	7
5	3	22	81	6	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	80	10	298.1	3	0	0	88	1015	7
5	3	22	81	7	-5.3	0.083	-9	-9	-999	55	9.9	0.212	0.48	0.56	1.6	90	10	300.4	3	0	0	82	1016	0
5	3	22	81	8	57	0.279	1.097	0.006	841	339	-34.6	0.212	0.48	0.27	2.3	93	10	302.5	3	0	0	77	1016	0
5	3	22	81	9	92.5	0.337	1.328	0.006	919	450	-37.6	0.212	0.48	0.2	2.8	100	10	303.5	3	0	0	70	1017	4
5	3	22	81	10	113.2	0.352	1.451	0.006	981	480	-34.9	0.212	0.48	0.18	2.9	104	10	304.8	3	0	0	61	1017	7
5	3	22	81	11	145.3	0.387	1.619	0.007	1060	553	-36.1	0.212	0.48	0.18	3.2	110	10	305.5	3	0	0	57	1017	6
5	3	22	81	12	138.2	0.376	1.629	0.007	1136	531	-34.9	0.212	0.48	0.18	3.1	111	10	305.6	3	0	0	54	1016	7
5	3	22	81	13	130.8	0.375	1.633	0.007	1207	527	-36.4	0.212	0.48	0.18	3.1	109	10	305.6	3	0	0	52	1016	8
5	3	22	81	14	115.7	0.352	1.594	0.007	1270	482	-34.3	0.212	0.48	0.18	2.9	104	10	305.4	3	0	0	50	1015	8
5	3	22	81	15	85.5	0.335	1.459	0.007	1316	447	-39.9	0.212	0.48	0.18	2.8	107	10	305	3	0	0	56	1014	9
5	3	22	81	16	54.6	0.325	1.266	0.007	1344	426	-56.8	0.212	0.48	0.19	2.8	112	10	304	3	0	0	59	1014	9
5	3	22	81	17	7.6	0.269	0.658	0.007	1345	323	-231.3	0.212	0.48	0.22	2.5	111	10	302.1	3	0	0	63	1014	10
5	3	22	81	18	1.6	-9	-9	-9	1344	-999	-99999	0.212	0.48	0.38	2.1	111	10	301	3	0	0	68	1015	99
5	3	22	81	19	-4.4	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	103	10	300.2	3	0	0	74	1015	3
5	3	22	81	20	-4.4	0.076	-9	-9	-999	49	9.3	0.562	0.7	1	1.1	83	10	299.6	3	0	0	74	1016	0
5	3	22	81	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	98	10	299	3	0	0	75	1016	99
5	3	22	81	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	90	10	299	3	0	0	76	1016	99
5	3	22	81	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	298.9	3	0	0	77	1016	3
5	3	22	81	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	298.4	3	0	0	79	1016	3
5	3	23	82	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	38	10	297.8	3	0	0	82	1016	99
5	3	23	82	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	297.9	3	0	0	85	1015	3
5	3	23	82	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	297.8	3	0	0	86	1015	3
5	3	23	82	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	89	10	297.2	3	0	0	88	1015	3
5	3	23	82	5	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	81	10	297.4	3	0	0	90	1016	0
5	3	23	82	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	298.1	3	0	0	88	1016	3
5	3	23	82	7	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	0.56	0.9	107	10	300.1	3	0	0	82	1017	0
5	3	23	82	8	56.9	0.232	0.889	0.005	448	257	-19.9	0.212	0.48	0.27	1.8	110	10	302.1	3	0	0	74	1018	0
5	3	23	82	9	104.1	0.312	1.348	0.005	856	401	-26.6	0.212	0.48	0.2	2.5	106	10	304.1	3	0	0	66	1018	0
5	3	23	82	10	138.2	0.32	1.573	0.005	1023	415	-21.4	0.212	0.48	0.18	2.5	113	10	305.4	3	0	0	59	1018	0
5	3	23	82	11	158.9	0.352	1.745	0.006	1215	480	-24.9	0.212	0.48	0.18	2.8	119	10	305.9	3	0	0	54	1018	5
5	3	23	82	12	171.5	0.364	1.885	0.007	1419	504	-25.4	0.212	0.48	0.18	2.9	120	10	306.6	3	0	0	47	1017	6
5	3	23	82	13	150.5	0.35	1.836	0.007	1494	477	-25.9	0.212	0.48	0.18	2.8	109	10	306.4	3	0	0	44	1016	7
5	3	23	82	14	141.5	0.339	1.826	0.006	1561	454	-25	0.212	0.48	0.18	2.7	119	10	306.4	3	0	0	44	1015	7
5	3	23	82	15	96.1	0.31	1.615	0.006	1588	398	-28.1	0.212	0.48	0.18	2.5	105	10	305.5	3	0	0	49	1015	8
5	3	23	82	16	60.8	0.299	1.391	0.005	1604	377	-39.9	0.212	0.48	0.19	2.5	108	10	304.5	3	0	0	49	1015	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	23	82	17	16.4	0.248	0.9	0.005	1607	286	-84.5	0.212	0.48	0.22	2.2	112	10	302.9	3	0	0	59	1015	10
5	3	23	82	18	0.1	0.177	0.165	0.005	1605	172	-5005.4	0.212	0.48	0.38	1.7	109	10	300.9	3	0	0	63	1016	3
5	3	23	82	19	-2.7	0.057	-9	-9	-999	44	6.1	0.212	0.48	1	1.1	112	10	299.9	3	0	0	72	1016	3
5	3	23	82	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	110	10	299	3	0	0	77	1016	0
5	3	23	82	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	105	10	298.4	3	0	0	80	1017	99
5	3	23	82	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	76	10	298	3	0	0	83	1017	99
5	3	23	82	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	98	10	297.5	3	0	0	87	1016	0
5	3	23	82	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	96	10	297.4	3	0	0	90	1016	3
5	3	24	83	1	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	93	10	297.2	3	0	0	88	1015	3
5	3	24	83	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	87	10	297.2	3	0	0	87	1015	0
5	3	24	83	3	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	60	10	296.8	3	0	0	88	1015	99
5	3	24	83	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	86	10	296.9	3	0	0	90	1015	3
5	3	24	83	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	106	10	297.2	3	0	0	85	1016	0
5	3	24	83	6	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	65	10	298.4	3	0	0	85	1016	3
5	3	24	83	7	-2.4	0.057	-9	-9	-999	31	7	0.212	0.48	0.55	1.1	92	10	301	3	0	0	78	1017	0
5	3	24	83	8	64.2	0.235	1.034	0.005	625	261	-18.3	0.212	0.48	0.26	1.8	110	10	303	3	0	0	72	1017	0
5	3	24	83	9	111.8	0.258	1.373	0.005	840	301	-13.9	0.212	0.48	0.2	1.9	113	10	304.9	3	0	0	63	1018	0
5	3	24	83	10	147.5	0.275	1.573	0.005	958	331	-12.7	0.212	0.48	0.18	2	114	10	306.1	3	0	0	55	1017	0
5	3	24	83	11	90.3	0.271	1.368	0.005	1029	324	-19.9	0.212	0.48	0.18	2.1	113	10	305.4	3	0	0	52	1017	9
5	3	24	83	12	141.4	0.292	1.645	0.005	1142	363	-16	0.212	0.48	0.18	2.2	99	10	306	3	0	0	52	1016	7
5	3	24	83	13	132.8	0.291	1.66	0.005	1249	360	-16.7	0.212	0.48	0.18	2.2	102	10	306.6	3	0	0	50	1015	8
5	3	24	83	14	113.1	0.305	1.611	0.005	1339	387	-22.6	0.212	0.48	0.18	2.4	108	10	306.2	3	0	0	52	1014	8
5	3	24	83	15	103.9	0.303	1.598	0.005	1422	383	-24.1	0.212	0.48	0.18	2.4	119	10	306.1	3	0	0	44	1014	8
5	3	24	83	16	62.8	0.272	1.366	0.005	1471	327	-29	0.212	0.48	0.19	2.2	113	10	305.5	3	0	0	45	1014	9
5	3	24	83	17	19.6	0.222	0.929	0.005	1481	242	-50.8	0.212	0.48	0.22	1.9	113	10	303.5	3	0	0	52	1014	10
5	3	24	83	18	0.1	0.166	0.16	0.005	1475	157	-4173.9	0.212	0.48	0.38	1.6	118	10	301.4	3	0	0	63	1015	3
5	3	24	83	19	-3.3	0.062	-9	-9	-999	43	6.7	0.212	0.48	1	1.2	108	10	300.1	3	0	0	72	1015	3
5	3	24	83	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	108	10	299.4	3	0	0	72	1015	0
5	3	24	83	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	88	10	298.9	3	0	0	79	1016	3
5	3	24	83	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	298.2	3	0	0	82	1016	3
5	3	24	83	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	83	10	298	3	0	0	91	1015	0
5	3	24	83	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	297.6	3	0	0	88	1015	3
5	3	25	84	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	58	10	297.4	3	0	0	94	1014	3
5	3	25	84	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	78	10	297.4	3	0	0	94	1014	7
5	3	25	84	3	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	90	10	297.4	3	0	0	94	1014	3
5	3	25	84	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	96	10	297.5	3	0	0	94	1014	7
5	3	25	84	5	-1.4	0.045	-9	-9	-999	22	5.7	0.687	0.8	1	0.6	146	10	297.2	3	0	0.51	94	1014	3
5	3	25	84	6	-1.9	0.052	-9	-9	-999	27	6.7	0.687	0.8	1	0.7	144	10	297.2	3	0	0.25	94	1014	3
5	3	25	84	7	-1.2	0.045	-9	-9	-999	22	6.5	0.687	0.8	0.55	0.6	159	10	298.5	3	0	0.25	94	1015	0
5	3	25	84	8	45.9	0.19	0.645	0.005	212	191	-13.6	0.212	0.48	0.26	1.4	116	10	300.9	3	0	0	94	1015	0
5	3	25	84	9	73.4	0.219	0.925	0.005	390	236	-13	0.212	0.48	0.2	1.6	130	10	302	3	0	0	94	1016	8
5	3	25	84	10	51.1	0.182	0.899	0.005	514	180	-10.8	0.212	0.48	0.18	1.3	127	10	301.9	3	0	0	94	1016	10
5	3	25	84	11	71.4	0.256	1.105	0.005	684	298	-21.3	0.212	0.48	0.18	2	96	10	300.1	3	0	0.51	94	1016	9
5	3	25	84	12	97	0.186	1.318	0.005	855	185	-6	0.212	0.48	0.18	1.2	126	10	300.4	3	0	1.27	91	1015	9
5	3	25	84	13	126.2	0.28	1.516	0.006	998	340	-15.7	0.212	0.48	0.18	2.1	131	10	302.5	3	0	0	88	1014	8
5	3	25	84	14	90.5	0.29	1.402	0.006	1100	359	-24.3	0.212	0.48	0.18	2.3	129	10	302.8	3	0	0.25	85	1013	9
5	3	25	84	15	58.5	0.28	1.23	0.006	1151	341	-33.8	0.212	0.48	0.18	2.3	134	10	301.4	3	0	0	87	1013	10
5	3	25	84	16	17.3	0.211	0.822	0.006	1158	225	-49.2	0.212	0.48	0.19	1.8	106	10	299.6	3	0	0.25	89	1013	10
5	3	25	84	17	2.9	0.165	0.455	0.006	1157	154	-137.8	0.212	0.48	0.22	1.5	100	10	297.6	3	0	0	91	1013	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	25	84	18	0.1	0.197	0.148	0.006	1156	202	-6957.5	0.212	0.48	0.38	1.9	117	10	296.9	3	0	0	92	1013	7
5	3	25	84	19	-1	0.036	-9	-9	-999	67	4.4	0.212	0.48	1	0.7	94	10	296.8	3	0	0	94	1013	7
5	3	25	84	20	-1	0.036	-9	-9	-999	17	4.4	0.212	0.48	1	0.7	88	10	296.9	3	0	0	90	1013	7
5	3	25	84	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	80	10	296.9	3	0	0	88	1014	7
5	3	25	84	22	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	66	10	296.6	3	0	0	94	1014	0
5	3	25	84	23	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	139	10	296.8	3	0	0	94	1014	7
5	3	25	84	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	81	10	296.4	3	0	0	94	1014	3
5	3	26	85	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	64	10	296.4	3	0	0	94	1013	3
5	3	26	85	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	296	3	0	0	90	1012	3
5	3	26	85	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	295.9	3	0	0	97	1012	3
5	3	26	85	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	295.9	3	0	0	90	1012	3
5	3	26	85	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	105	10	296.5	3	0	0	93	1013	0
5	3	26	85	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	296.8	3	0	0	100	1013	3
5	3	26	85	7	-2.5	0.063	-9	-9	-999	36	9	0.562	0.7	0.54	0.9	79	10	300	3	0	0	100	1014	0
5	3	26	85	8	42.2	0.169	0.631	0.005	216	160	-10.4	0.212	0.48	0.26	1.2	97	10	301.4	3	0	0	79	1015	0
5	3	26	85	9	82.1	0.231	1.012	0.005	457	255	-13.6	0.212	0.48	0.2	1.7	129	10	302.2	3	0	0	75	1015	7
5	3	26	85	10	52	0.249	0.955	0.005	607	286	-27	0.212	0.48	0.18	2	124	10	300.5	3	0	9.65	94	1015	10
5	3	26	85	11	113.4	0.179	1.38	0.005	839	175	-4.6	0.212	0.48	0.18	1.1	116	10	300.9	3	0	0.25	85	1015	8
5	3	26	85	12	117.6	0.239	1.448	0.005	935	269	-10.5	0.212	0.48	0.18	1.7	110	10	303.1	3	0	0	75	1014	8
5	3	26	85	13	93.9	0.244	1.379	0.005	1010	277	-13.9	0.212	0.48	0.18	1.8	109	10	303.4	3	0	0	65	1013	9
5	3	26	85	14	39.9	0.244	1.046	0.005	1036	277	-32.9	0.212	0.48	0.18	2	122	10	299.4	3	0	1.52	85	1013	10
5	3	26	85	15	45.6	0.161	1.106	0.005	1072	151	-8.3	0.212	0.48	0.18	1.1	93	10	299.1	3	0	0	82	1012	10
5	3	26	85	16	25.9	0.208	0.921	0.005	1092	219	-31.6	0.212	0.48	0.19	1.7	87	10	298.9	3	0	2.29	88	1012	10
5	3	26	85	17	2.9	0.194	0.445	0.005	1092	197	-227.3	0.212	0.48	0.22	1.8	115	10	297.5	3	0	0.25	94	1013	10
5	3	26	85	18	0.1	0.095	0.145	0.005	1091	71	-764.5	0.212	0.48	0.38	0.9	97	10	297.1	3	0	0	94	1013	7
5	3	26	85	19	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	56	10	297	3	0	0	94	1013	7
5	3	26	85	20	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	70	10	296.8	3	0	0	94	1013	7
5	3	26	85	21	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	81	10	296.8	3	0	0	999	1014	7
5	3	26	85	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1.2	79	10	296.9	3	0	0	999	1014	99
5	3	26	85	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.5	108	10	297	3	0	0	999	1014	99
5	3	26	85	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	73	10	296.8	3	0	0	999	1014	99
5	3	27	86	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	93	10	296.4	3	0	0	999	1013	99
5	3	27	86	2	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.5	52	10	296	3	0	0	999	1012	99
5	3	27	86	3	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.5	44	10	295.9	3	0	0	999	1012	99
5	3	27	86	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	34	10	295.8	3	0	0	999	1012	99
5	3	27	86	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	3	0	0	999	1013	99
5	3	27	86	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.6	3	0	0	999	1014	99
5	3	27	86	7	-0.5	0.026	-9	-9	-999	10	3.2	0.212	0.48	0.54	0.5	122	10	299.6	3	0	0	999	1014	0
5	3	27	86	8	58.6	0.214	0.62	0.005	147	228	-15.2	0.212	0.48	0.26	1.6	123	10	301.8	3	0	0	85	1015	0
5	3	27	86	9	106.6	0.303	1.069	0.005	415	384	-23.7	0.212	0.48	0.2	2.4	121	10	303	3	0	0	999	1015	0
5	3	27	86	10	126.3	0.298	1.369	0.007	735	375	-19	0.212	0.48	0.18	2.3	130	10	304.2	3	0	0	999	1015	6
5	3	27	86	11	146.5	0.303	1.521	0.007	869	383	-17.1	0.212	0.48	0.18	2.3	118	10	304.9	3	0	0	999	1014	6
5	3	27	86	12	161.9	0.315	1.634	0.005	976	406	-17.4	0.212	0.48	0.18	2.4	124	10	305.4	3	0	0	999	1014	6
5	3	27	86	13	142.4	0.321	1.612	0.005	1064	417	-20.9	0.212	0.48	0.18	2.5	121	10	305.2	3	0	0	999	1013	7
5	3	27	86	14	129	0.318	1.596	0.005	1140	412	-22.5	0.212	0.48	0.18	2.5	116	10	305.1	3	0	0	57	1012	8
5	3	27	86	15	76.2	0.305	1.356	0.005	1183	387	-33.5	0.212	0.48	0.18	2.5	114	10	304.2	3	0	0	999	1012	9
5	3	27	86	16	52.6	0.305	1.208	0.005	1211	388	-48.9	0.212	0.48	0.19	2.6	112	10	302.9	3	0	0	999	1012	9
5	3	27	86	17	4.5	0.216	0.532	0.005	1211	234	-204.5	0.212	0.48	0.22	2	111	10	301.4	3	0	0	999	1012	10
5	3	27	86	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.38	1.7	111	10	300.1	3	0	0	999	1012	99

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	27	86	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	111	10	299.1	3	0	0	999	1013	99
5	3	27	86	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	103	10	298.4	3	0	0	79	1013	7
5	3	27	86	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	84	10	298	3	0	0	82	1014	7
5	3	27	86	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	94	10	297.6	3	0	0	85	1014	99
5	3	27	86	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	297.4	3	0	0	88	1014	3
5	3	27	86	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	71	10	297.2	3	0	0	88	1013	3
5	3	28	87	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	67	10	296.8	3	0	0	88	1013	3
5	3	28	87	2	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	97	10	297	3	0	0	97	1012	7
5	3	28	87	3	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	114	10	297.1	3	0	0	94	1012	0
5	3	28	87	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	297	3	0	0	88	1013	3
5	3	28	87	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	67	10	296.6	3	0	0	90	1013	7
5	3	28	87	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	297	3	0	0	85	1014	7
5	3	28	87	7	-2.4	0.063	-9	-9	-999	36	9.1	0.562	0.7	0.53	0.9	78	10	298.8	3	0	0	88	1014	0
5	3	28	87	8	53.4	0.203	0.92	0.005	528	210	-14.1	0.212	0.48	0.26	1.5	111	10	301.9	3	0	0	74	1015	0
5	3	28	87	9	85.6	0.27	1.268	0.005	862	322	-20.7	0.212	0.48	0.2	2.1	106	10	300.4	3	0	0.51	78	1015	6
5	3	28	87	10	121.9	0.279	1.518	0.007	1041	339	-16.1	0.212	0.48	0.18	2.1	104	10	301.4	3	0	0.25	82	1015	6
5	3	28	87	11	144.2	0.302	1.709	0.008	1255	382	-17.3	0.212	0.48	0.18	2.3	112	10	303.2	3	0	0	75	1015	6
5	3	28	87	12	147.8	0.34	1.754	0.008	1321	457	-24.1	0.212	0.48	0.18	2.7	111	10	304.1	3	0	0	69	1014	7
5	3	28	87	13	94.1	0.3	1.521	0.008	1351	379	-25.9	0.212	0.48	0.18	2.4	108	10	303.9	3	0	0	63	1013	9
5	3	28	87	14	38.5	0.271	1.132	0.007	1363	325	-46.8	0.212	0.48	0.18	2.3	112	10	302.9	3	0	0	61	1012	10
5	3	28	87	15	69.7	0.302	1.388	0.007	1385	383	-35.8	0.212	0.48	0.18	2.5	114	10	303.2	3	0	0	67	1012	9
5	3	28	87	16	22.5	0.225	0.953	0.007	1390	247	-45.5	0.212	0.48	0.19	1.9	98	10	301.4	3	0	0	70	1012	10
5	3	28	87	17	4.2	0.187	0.546	0.007	1391	186	-139.9	0.212	0.48	0.22	1.7	94	10	300.8	3	0	0	85	1012	10
5	3	28	87	18	0.1	0.181	0.157	0.007	1390	177	-5363.2	0.562	0.7	0.38	1.3	74	10	299.2	3	0	0	88	1012	7
5	3	28	87	19	-4	0.073	-9	-9	-999	52	8.8	0.212	0.48	1	1.4	86	10	298.5	3	0	0	88	1013	7
5	3	28	87	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	81	10	298.4	3	0	0	82	1013	3
5	3	28	87	21	-2.9	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	84	10	298	3	0	0	84	1013	3
5	3	28	87	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	95	10	297.8	3	0	0	87	1013	99
5	3	28	87	23	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	80	10	297.5	3	0	0	90	1013	3
5	3	28	87	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	100	10	297.8	3	0	0	89	1013	3
5	3	29	88	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	73	10	297.9	3	0	0	88	1013	99
5	3	29	88	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	68	10	297.6	3	0	0	88	1012	7
5	3	29	88	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	62	10	297.4	3	0	0	999	1012	7
5	3	29	88	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	55	10	297.2	3	0	0	999	1012	99
5	3	29	88	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	75	10	297	3	0	0	999	1013	99
5	3	29	88	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.5	42	10	297.6	3	0	0	999	1014	99
5	3	29	88	7	-1.9	0.056	-9	-9	-999	30	8.3	0.562	0.7	0.53	0.8	74	10	300.5	3	0	0	999	1014	0
5	3	29	88	8	55.1	0.222	1.089	0.005	849	241	-18	0.212	0.48	0.26	1.7	101	10	302.4	3	0	0	72	1015	0
5	3	29	88	9	94.3	0.281	1.343	0.005	929	343	-21.4	0.212	0.48	0.2	2.2	107	10	303.5	3	0	0	63	1015	5
5	3	29	88	10	143.9	0.321	1.61	0.005	1052	418	-20.8	0.212	0.48	0.18	2.5	110	10	304.6	3	0	0	59	1015	0
5	3	29	88	11	140.7	0.32	1.658	0.005	1173	417	-21.1	0.212	0.48	0.18	2.5	104	10	305	3	0	0	57	1014	7
5	3	29	88	12	154.3	0.332	1.772	0.005	1305	440	-21.5	0.212	0.48	0.18	2.6	107	10	305.1	3	0	0	56	1013	7
5	3	29	88	13	106.3	0.341	1.611	0.005	1423	458	-33.7	0.212	0.48	0.18	2.8	115	10	304.4	3	0	0	59	1013	9
5	3	29	88	14	112	0.324	1.713	0.007	1623	424	-27.3	0.212	0.48	0.18	2.6	110	10	304	3	0	0	54	1012	8
5	3	29	88	15	111.9	0.342	1.73	0.007	1672	461	-32.3	0.212	0.48	0.18	2.8	118	10	304.4	3	0	0	63	1012	8
5	3	29	88	16	39.6	0.281	1.228	0.007	1688	344	-50.6	0.212	0.48	0.19	2.4	111	10	303.2	3	0	0	63	1012	10
5	3	29	88	17	16.2	0.229	0.912	0.007	1693	253	-67.2	0.212	0.48	0.22	2	116	10	302.4	3	0	0	55	1012	10
5	3	29	88	18	0.1	0.166	0.168	0.007	1691	157	-4164.2	0.212	0.48	0.38	1.6	107	10	300.6	3	0	0	67	1012	7
5	3	29	88	19	-3.9	0.073	-9	-9	-999	49	8.8	0.212	0.48	1	1.4	109	10	299.9	3	0	0	80	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	29	88	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	105	10	299.4	3	0	0	94	1013	7
5	3	29	88	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	87	10	298.8	3	0	0	91	1014	7
5	3	29	88	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	88	10	298	3	0	0	88	1014	3
5	3	29	88	23	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	88	10	297.9	3	0	0	90	1014	0
5	3	29	88	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	297.5	3	0	0	94	1014	3
5	3	30	89	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	297.5	3	0	0	94	1013	3
5	3	30	89	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	50	10	297	3	0	0	88	1013	3
5	3	30	89	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	50	10	296.5	3	0	0	94	1013	3
5	3	30	89	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	80	10	296.9	3	0	0	94	1013	3
5	3	30	89	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	40	10	296.8	3	0	0	94	1013	0
5	3	30	89	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.5	79	10	297.1	3	0	0	91	1014	99
5	3	30	89	7	-4.2	0.078	-9	-9	-999	50	10.3	0.212	0.48	0.52	1.5	109	10	300.5	3	0	0	88	1015	0
5	3	30	89	8	63.4	0.282	0.887	0.005	398	344	-31.9	0.212	0.48	0.26	2.3	115	10	302.5	3	0	0	85	1015	0
5	3	30	89	9	107.1	0.322	1.238	0.005	641	421	-28.3	0.212	0.48	0.2	2.6	114	10	303.9	3	0	0	75	1015	0
5	3	30	89	10	139.8	0.301	1.477	0.005	835	380	-17.7	0.212	0.48	0.18	2.3	112	10	304.9	3	0	0	66	1015	4
5	3	30	89	11	152.8	0.313	1.598	0.005	968	403	-18.2	0.212	0.48	0.18	2.4	122	10	305.4	3	0	0	57	1014	6
5	3	30	89	12	138.2	0.31	1.608	0.005	1089	397	-19.5	0.212	0.48	0.18	2.4	127	10	305.6	3	0	0	56	1014	8
5	3	30	89	13	123.3	0.317	1.598	0.005	1196	410	-23.2	0.212	0.48	0.18	2.5	127	10	305.5	3	0	0	55	1013	8
5	3	30	89	14	103.7	0.284	1.545	0.005	1286	348	-19.9	0.212	0.48	0.18	2.2	118	10	305.2	3	0	0	54	1012	9
5	3	30	89	15	92.9	0.29	1.52	0.005	1366	360	-23.8	0.212	0.48	0.18	2.3	106	10	305	3	0	0	57	1012	8
5	3	30	89	16	53.1	0.278	1.275	0.005	1410	337	-36.4	0.212	0.48	0.19	2.3	112	10	303.9	3	0	0	60	1012	9
5	3	30	89	17	16.3	0.239	0.862	0.005	1420	269	-75.5	0.212	0.48	0.22	2.1	110	10	302.5	3	0	0	63	1012	10
5	3	30	89	18	0.1	0.187	0.158	0.005	1415	187	-5916.4	0.212	0.48	0.38	1.8	112	10	300.9	3	0	0	68	1012	7
5	3	30	89	19	-3.4	0.067	-9	-9	-999	51	8.2	0.212	0.48	1	1.3	93	10	299.9	3	0	0	74	1013	7
5	3	30	89	20	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	84	10	299.1	3	0	0	82	1014	7
5	3	30	89	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	84	10	298.6	3	0	0	82	1014	7
5	3	30	89	22	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	79	10	298.4	3	0	0	85	1014	7
5	3	30	89	23	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	81	10	298	3	0	0	88	1014	0
5	3	30	89	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	105	10	297.9	3	0	0	82	1014	7
5	3	31	90	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	298.1	3	0	0	88	1013	7
5	3	31	90	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	69	10	297.6	3	0	0	88	1012	0
5	3	31	90	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	297.2	3	0	0	94	1012	7
5	3	31	90	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	65	10	297.4	3	0	0	94	1012	3
5	3	31	90	5	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	55	10	297.4	3	0	0	88	1013	3
5	3	31	90	6	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	80	10	298	3	0	0	100	1013	7
5	3	31	90	7	-6.4	0.104	-9	-9	-999	77	15.9	0.562	0.7	0.52	1.5	83	10	299.1	3	0	0	94	1014	0
5	3	31	90	8	71.6	0.329	0.751	0.005	214	435	-45.1	0.562	0.7	0.25	2	81	10	301.5	3	0	0	91	1015	0
5	3	31	90	9	75	0.266	0.884	0.006	333	318	-22.8	0.212	0.48	0.2	2.1	113	10	302.1	3	0	0	79	1015	8
5	3	31	90	10	115.5	0.286	1.182	0.005	518	353	-18.4	0.212	0.48	0.18	2.2	116	10	303.4	3	0	0	94	1015	7
5	3	31	90	11	138.9	0.32	1.416	0.005	741	416	-21.3	0.212	0.48	0.18	2.5	128	10	304.4	3	0	0	74	1015	7
5	3	31	90	12	117.9	0.296	1.438	0.005	913	372	-20	0.212	0.48	0.18	2.3	138	10	303.9	3	0	0	88	1014	8
5	3	31	90	13	98.2	0.346	1.414	0.005	1042	467	-38	0.687	0.8	0.18	1.9	145	10	300.5	3	0	2.79	66	1013	10
5	3	31	90	14	88.8	0.261	1.423	0.005	1171	310	-18.1	0.212	0.48	0.18	2	120	10	302.2	3	0	0	63	1012	9
5	3	31	90	15	85.1	0.251	1.451	0.005	1298	289	-16.7	0.212	0.48	0.18	1.9	117	10	304.2	3	0	0	65	1012	9
5	3	31	90	16	28.4	-9	-9	-9	1330	-999	-99999	0.475	0.6	0.18	0	0	10	302.2	3	0	0	65	1012	10
5	3	31	90	17	4.4	0.178	0.545	0.005	1332	172	-115.2	0.212	0.48	0.22	1.6	110	10	301.1	3	0	0	67	1012	10
5	3	31	90	18	0.1	0.115	0.155	0.005	1328	90	-1372.1	0.212	0.48	0.38	1.1	106	10	300.1	3	0	0	74	1012	7
5	3	31	90	19	-1	0.036	-9	-9	-999	20	4.4	0.212	0.48	1	0.7	98	10	299.6	3	0	0	77	1012	7
5	3	31	90	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	298.9	3	0	0	85	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	3	31	90	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	298.5	3	0	0	999	1013	7
5	3	31	90	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	96	10	298.4	3	0	0	999	1014	99
5	3	31	90	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	93	10	298.4	3	0	0	999	1014	99
5	3	31	90	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	102	10	298.2	3	0	0	999	1013	99
5	4	1	91	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	42	10	297.9	3	0	0	999	1013	99
5	4	1	91	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	32	10	297.4	3	0	0	88	1012	7
5	4	1	91	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	78	10	297.4	3	0	0	999	1012	7
5	4	1	91	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	46	10	297.2	3	0	0	999	1012	99
5	4	1	91	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	56	10	296.9	3	0	0	999	1013	99
5	4	1	91	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	89	10	297.4	3	0	0	999	1013	99
5	4	1	91	7	-3.5	0.073	-9	-9	-999	45	9.9	0.212	0.48	0.51	1.4	107	10	300.8	3	0	0	999	1014	0
5	4	1	91	8	44.5	0.246	-9	-9	-999	281	-30.3	0.212	0.48	0.25	2	104	10	302.2	3	0	0	77	1015	0
5	4	1	91	9	108.7	0.313	-9	-9	-999	403	-25.6	0.212	0.48	0.2	2.5	113	10	303.9	3	0	0	70	1015	0
5	4	1	91	10	131	0.328	-9	-9	-999	431	-24.3	0.212	0.48	0.18	2.6	104	10	304.6	3	0	0	61	1015	6
5	4	1	91	11	152.8	0.351	-9	-9	-999	478	-25.5	0.212	0.48	0.18	2.8	114	10	305.4	3	0	0	61	1015	6
5	4	1	91	12	148.6	0.369	-9	-9	-999	515	-30.5	0.212	0.48	0.18	3	116	10	305.6	3	0	0	58	1014	7
5	4	1	91	13	156.2	0.351	-9	-9	-999	479	-25.1	0.212	0.48	0.18	2.8	114	10	305.8	3	0	0	58	1013	7
5	4	1	91	14	108.1	0.332	-9	-9	-999	440	-30.6	0.212	0.48	0.18	2.7	114	10	305.2	3	0	0	59	1012	8
5	4	1	91	15	83.9	0.316	-9	-9	-999	409	-34	0.212	0.48	0.18	2.6	111	10	304.9	3	0	0	61	1011	9
5	4	1	91	16	56.1	0.298	-9	-9	-999	374	-42.4	0.212	0.48	0.19	2.5	109	10	304.1	3	0	0	63	1011	9
5	4	1	91	17	10.5	0.272	-9	-9	-999	327	-172.9	0.212	0.48	0.22	2.5	110	10	302.2	3	0	0	65	1011	10
5	4	1	91	18	0.1	0.218	-9	-9	-999	235	-8888	0.212	0.48	0.38	2.1	114	10	300.9	3	0	0	70	1012	3
5	4	1	91	19	-5.1	0.078	-9	-9	-999	67	8.4	0.212	0.48	1	1.5	111	10	300	3	0	0	82	1013	3
5	4	1	91	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	101	10	299.6	3	0	0	82	1013	3
5	4	1	91	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	106	10	299.2	3	0	0	85	1014	3
5	4	1	91	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	94	10	298.9	3	0	0	88	1014	3
5	4	1	91	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	298.5	3	0	0	85	1014	0
5	4	1	91	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	298.2	3	0	0	88	1013	3
5	4	2	92	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	297.9	3	0	0	94	1013	3
5	4	2	92	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	81	10	297.5	3	0	0	94	1012	3
5	4	2	92	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	297.6	3	0	0	94	1012	3
5	4	2	92	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.4	3	0	0	88	1012	3
5	4	2	92	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	297	3	0	0	94	1013	7
5	4	2	92	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	297.8	3	0	0	94	1014	3
5	4	2	92	7	-2.1	0.057	-9	-9	-999	31	7.9	0.212	0.48	0.51	1.1	97	10	300.9	3	0	0	94	1014	0
5	4	2	92	8	55.6	0.269	0.702	0.005	225	322	-31.8	0.212	0.48	0.25	2.2	113	10	302.5	3	0	0	85	1015	0
5	4	2	92	9	106	0.275	1.245	0.005	659	331	-17.7	0.212	0.48	0.2	2.1	120	10	304.4	3	0	0	65	1015	0
5	4	2	92	10	110.7	0.267	1.376	0.005	853	317	-15.5	0.212	0.48	0.18	2	114	10	305.5	3	0	0	65	1015	7
5	4	2	92	11	141.2	0.301	1.55	0.005	955	380	-17.5	0.212	0.48	0.18	2.3	123	10	305.9	3	0	0	59	1015	7
5	4	2	92	12	161.1	0.306	1.684	0.005	1072	388	-16	0.212	0.48	0.18	2.3	124	10	306.8	3	0	0	58	1014	6
5	4	2	92	13	123.7	0.298	1.584	0.005	1162	374	-19.3	0.212	0.48	0.18	2.3	123	10	306.4	3	0	0	56	1013	8
5	4	2	92	14	120.7	0.288	1.61	0.005	1249	355	-17.8	0.212	0.48	0.18	2.2	126	10	306.4	3	0	0	59	1012	8
5	4	2	92	15	82.8	0.297	1.442	0.005	1308	373	-28.6	0.212	0.48	0.18	2.4	127	10	305.6	3	0	0	58	1011	9
5	4	2	92	16	50.5	0.267	1.235	0.005	1343	318	-34.1	0.212	0.48	0.19	2.2	116	10	304.8	3	0	0	58	1011	9
5	4	2	92	17	9.4	0.242	0.705	0.005	1345	274	-136.3	0.212	0.48	0.22	2.2	114	10	302.9	3	0	0	63	1011	10
5	4	2	92	18	0.1	0.187	0.155	0.005	1341	187	-5914.4	0.212	0.48	0.38	1.8	110	10	301.1	3	0	0	70	1012	3
5	4	2	92	19	-5.1	0.078	-9	-9	-999	57	8.4	0.212	0.48	1	1.5	103	10	300.2	3	0	0	79	1013	3
5	4	2	92	20	-5.1	0.083	-9	-9	-999	55	10.4	0.562	0.7	1	1.2	85	10	299.8	3	0	0	85	1013	3
5	4	2	92	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	101	10	299.4	3	0	0	999	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	2	92	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.5	107	10	299.6	3	0	0	999	1014	99
5	4	2	92	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.4	101	10	299.6	3	0	0	999	1014	99
5	4	2	92	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.5	112	10	299.4	3	0	0	999	1014	99
5	4	3	93	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.4	117	10	299.1	3	0	0	999	1013	99
5	4	3	93	2	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	111	10	298.9	3	0	0	82	1013	7
5	4	3	93	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	106	10	298.5	3	0	0	999	1013	7
5	4	3	93	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	76	10	297.9	3	0	0	999	1013	99
5	4	3	93	5	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	82	10	297.4	3	0	0	999	1014	99
5	4	3	93	6	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.6	87	10	298	3	0	0	999	1014	99
5	4	3	93	7	-1.7	0.052	-9	-9	-999	27	7.4	0.212	0.48	0.5	1	94	10	301.1	3	0	0	999	1015	0
5	4	3	93	8	46	0.218	0.775	0.005	366	235	-20.5	0.212	0.48	0.25	1.7	103	10	302.4	3	0	0	77	1016	6
5	4	3	93	9	94.7	0.291	1.234	0.005	720	361	-23.5	0.212	0.48	0.19	2.3	109	10	303.9	3	0	0	70	1016	5
5	4	3	93	10	135.6	0.338	1.5	0.005	903	452	-25.8	0.212	0.48	0.18	2.7	115	10	305	3	0	0	65	1016	5
5	4	3	93	11	141	0.339	1.581	0.005	1017	454	-25	0.212	0.48	0.18	2.7	115	10	305.5	3	0	0	63	1015	7
5	4	3	93	12	130.8	0.328	1.595	0.005	1123	431	-24.3	0.212	0.48	0.18	2.6	114	10	305.8	3	0	0	58	1014	8
5	4	3	93	13	138.4	0.329	1.677	0.005	1235	434	-23.3	0.212	0.48	0.18	2.6	114	10	305.9	3	0	0	58	1014	8
5	4	3	93	14	112.7	0.324	1.604	0.005	1325	424	-27.2	0.212	0.48	0.18	2.6	111	10	305.4	3	0	0	61	1013	8
5	4	3	93	15	98.9	0.32	1.567	0.005	1405	417	-30	0.212	0.48	0.18	2.6	116	10	305.2	3	0	0	58	1012	8
5	4	3	93	16	45.8	0.293	1.222	0.005	1440	366	-49.7	0.212	0.48	0.19	2.5	109	10	304	3	0	0	61	1012	9
5	4	3	93	17	14.9	0.257	0.843	0.005	1448	300	-102.4	0.212	0.48	0.22	2.3	106	10	302.6	3	0	0	65	1012	10
5	4	3	93	18	0.1	0.187	0.159	0.005	1445	187	-5916.4	0.212	0.48	0.38	1.8	100	10	301.4	3	0	0	75	1012	3
5	4	3	93	19	-4.4	0.073	-9	-9	-999	54	7.8	0.212	0.48	1	1.4	100	10	300.5	3	0	0	79	1013	3
5	4	3	93	20	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	95	10	300.2	3	0	0	79	1013	0
5	4	3	93	21	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	106	10	299.9	3	0	0	82	1014	3
5	4	3	93	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	88	10	299.4	3	0	0	82	1015	3
5	4	3	93	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	95	10	298.9	3	0	0	82	1015	0
5	4	3	93	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	95	10	298.6	3	0	0	82	1014	3
5	4	4	94	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	63	10	298.4	3	0	0	88	1014	3
5	4	4	94	2	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	50	10	297.8	3	0	0	85	1013	3
5	4	4	94	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	67	10	297.8	3	0	0	88	1013	3
5	4	4	94	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	298	3	0	0	94	1014	3
5	4	4	94	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	55	10	297.6	3	0	0	91	1014	3
5	4	4	94	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.9	3	0	0	94	1014	3
5	4	4	94	7	-3.2	0.076	-9	-9	-999	49	12.8	0.562	0.7	0.5	1.1	82	10	300.5	3	0	0	88	1015	0
5	4	4	94	8	62.8	0.253	0.922	0.005	452	293	-23.4	0.212	0.48	0.25	2	103	10	302.9	3	0	0	82	1016	0
5	4	4	94	9	100.3	0.321	1.323	0.005	836	418	-29.8	0.212	0.48	0.19	2.6	106	10	304	3	0	0	999	1016	2
5	4	4	94	10	107.3	0.313	1.407	0.005	941	402	-25.8	0.212	0.48	0.18	2.5	110	10	304.8	3	0	0	999	1016	7
5	4	4	94	11	140.7	0.33	1.611	0.005	1078	435	-23	0.212	0.48	0.18	2.6	121	10	304.9	3	0	0	999	1015	7
5	4	4	94	12	147.1	0.35	1.829	0.011	1508	476	-26.4	0.212	0.48	0.18	2.8	113	10	305.6	3	0	0	999	1014	7
5	4	4	94	13	150.3	0.341	1.853	0.011	1533	458	-23.8	0.212	0.48	0.18	2.7	120	10	306	3	0	0	999	1013	7
5	4	4	94	14	123.4	0.317	1.748	0.011	1567	410	-23.2	0.212	0.48	0.18	2.5	114	10	305.9	3	0	0	999	1013	8
5	4	4	94	15	65.5	0.329	1.424	0.011	1592	434	-49	0.212	0.48	0.18	2.8	104	10	303.9	3	0	0	63	1012	9
5	4	4	94	16	48.3	0.294	1.291	0.011	1608	368	-47.6	0.212	0.48	0.19	2.5	110	10	303.2	3	0	0	999	1012	9
5	4	4	94	17	14.7	0.257	0.87	0.011	1611	300	-103.6	0.212	0.48	0.22	2.3	108	10	302.2	3	0	0	999	1012	10
5	4	4	94	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.38	1.8	107	10	300.9	3	0	0	999	1013	99
5	4	4	94	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	95	10	300	3	0	0	999	1013	99
5	4	4	94	20	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	94	10	299.4	3	0	0	82	1014	7
5	4	4	94	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	102	10	298.9	3	0	0	82	1015	7
5	4	4	94	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	298.6	3	0	0	82	1015	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	4	94	23	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	83	10	298.2	3	0	0	88	1015	0
5	4	4	94	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	70	10	297.9	3	0	0	82	1014	7
5	4	5	95	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	297.5	3	0	0	88	1013	7
5	4	5	95	2	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	92	10	297.4	3	0	0	79	1013	7
5	4	5	95	3	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	77	10	297.2	3	0	0	83	1013	99
5	4	5	95	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	66	10	297.1	3	0	0	88	1013	7
5	4	5	95	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	63	10	297.2	3	0	0	91	1014	7
5	4	5	95	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	63	10	297.9	3	0	0	94	1014	7
5	4	5	95	7	-2.8	0.067	-9	-9	-999	40	10	0.212	0.48	0.49	1.3	88	10	300.8	3	0	0	88	1015	0
5	4	5	95	8	53.1	0.259	1.112	0.005	940	303	-29.7	0.212	0.48	0.25	2.1	90	10	302.4	3	0	0	74	1016	0
5	4	5	95	9	56.1	0.26	1.143	0.005	966	305	-28.5	0.212	0.48	0.19	2.1	96	10	301.9	3	0	0.25	65	1016	9
5	4	5	95	10	137.6	0.32	1.575	0.005	1030	415	-21.5	0.212	0.48	0.18	2.5	104	10	303.1	3	0	0	61	1016	5
5	4	5	95	11	133.1	0.356	1.629	0.005	1178	489	-30.8	0.212	0.48	0.18	2.9	112	10	304.8	3	0	0	59	1015	7
5	4	5	95	12	135.2	0.319	1.719	0.005	1360	415	-21.7	0.212	0.48	0.18	2.5	110	10	305.5	3	0	0	55	1014	8
5	4	5	95	13	135.1	0.348	1.787	0.005	1531	471	-28.1	0.212	0.48	0.18	2.8	109	10	305.2	3	0	0	52	1014	8
5	4	5	95	14	117	0.353	1.732	0.005	1606	482	-33.9	0.212	0.48	0.18	2.9	114	10	305	3	0	0	56	1013	8
5	4	5	95	15	98.8	0.32	1.658	0.005	1670	418	-30.1	0.212	0.48	0.18	2.6	110	10	304.9	3	0	0	55	1013	8
5	4	5	95	16	48.5	0.294	1.316	0.005	1699	368	-47.5	0.212	0.48	0.19	2.5	108	10	303.6	3	0	0	59	1012	9
5	4	5	95	17	14.9	0.247	0.889	0.005	1706	284	-91.8	0.212	0.48	0.22	2.2	98	10	302.5	3	0	0	63	1013	10
5	4	5	95	18	0.1	0.197	0.168	0.005	1703	202	-6957.5	0.212	0.48	0.38	1.9	92	10	301	3	0	0	70	1013	7
5	4	5	95	19	-4.5	0.078	-9	-9	-999	60	9.4	0.212	0.48	1	1.5	89	10	299.9	3	0	0	73	1014	7
5	4	5	95	20	-4	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	87	10	299.4	3	0	0	77	1014	7
5	4	5	95	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	74	10	298.9	3	0	0	999	1015	7
5	4	5	95	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	80	10	298.4	3	0	0	999	1015	99
5	4	5	95	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	1	85	10	298.2	3	0	0	999	1015	99
5	4	5	95	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	84	10	297.9	3	0	0	999	1014	99
5	4	6	96	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	80	10	297.6	3	0	0	999	1014	99
5	4	6	96	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	60	10	297	3	0	0	82	1013	7
5	4	6	96	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	69	10	296.9	3	0	0	83	1013	7
5	4	6	96	4	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	75	10	296.8	3	0	0	84	1014	99
5	4	6	96	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	297	3	0	0	85	1014	3
5	4	6	96	6	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	82	10	297.4	3	0	0	81	1014	3
5	4	6	96	7	-3.6	0.083	-9	-9	-999	55	14.4	0.562	0.7	0.49	1.2	78	10	299.9	3	0	0	77	1015	0
5	4	6	96	8	50.3	0.239	0.899	0.005	523	269	-24.6	0.212	0.48	0.25	1.9	87	10	302	3	0	0	74	1016	0
5	4	6	96	9	81.5	0.306	1.242	0.005	854	389	-31.9	0.212	0.48	0.19	2.5	95	10	303.2	3	0	0	63	1016	7
5	4	6	96	10	108.6	0.313	1.427	0.005	970	403	-25.6	0.212	0.48	0.18	2.5	105	10	304.2	3	0	0	999	1016	7
5	4	6	96	11	124.4	0.317	1.559	0.005	1104	410	-23.1	0.212	0.48	0.18	2.5	102	10	305	3	0	0	999	1015	8
5	4	6	96	12	160.8	0.333	1.783	0.005	1278	443	-20.9	0.212	0.48	0.18	2.6	109	10	306.1	3	0	0	999	1015	6
5	4	6	96	13	112.7	0.333	1.632	0.006	1398	442	-29.7	0.212	0.48	0.18	2.7	104	10	305.1	3	0	0	52	1014	9
5	4	6	96	14	99	0.301	1.602	0.007	1504	381	-25	0.212	0.48	0.18	2.4	105	10	304.8	3	0	0	52	1013	9
5	4	6	96	15	73.4	0.285	1.462	0.007	1541	350	-28.5	0.212	0.48	0.18	2.3	103	10	304.6	3	0	0	52	1013	9
5	4	6	96	16	50.2	0.277	1.292	0.007	1554	335	-38.1	0.212	0.48	0.19	2.3	92	10	304	3	0	0	59	1012	9
5	4	6	96	17	16.3	0.258	0.89	0.007	1557	302	-95	0.212	0.48	0.22	2.3	88	10	302.6	3	0	0	61	1012	10
5	4	6	96	18	0.1	0.264	0.163	0.007	1556	312	-8888	0.562	0.7	0.38	1.9	84	10	301.1	3	0	0	67	1013	7
5	4	6	96	19	-8	0.104	-9	-9	-999	98	12.6	0.212	0.48	1	2	86	10	300.4	3	0	0	72	1013	7
5	4	6	96	20	-3.9	0.067	-9	-9	-999	41	7.1	0.212	0.48	1	1.3	91	10	299.9	3	0	0	74	1014	0
5	4	6	96	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	299.2	3	0	0	74	1014	7
5	4	6	96	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	298.6	3	0	0	74	1015	7
5	4	6	96	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	70	10	298.1	3	0	0	79	1015	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	6	96	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	55	10	297.8	3	0	0	74	1014	7
5	4	7	97	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	297.5	3	0	0	79	1013	7
5	4	7	97	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	56	10	297.2	3	0	0	85	1013	7
5	4	7	97	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	57	10	297	3	0	0	79	1013	3
5	4	7	97	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	67	10	297.2	3	0	0	79	1013	7
5	4	7	97	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	296.9	3	0	0	79	1014	3
5	4	7	97	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	297.8	3	0	0	85	1014	7
5	4	7	97	7	-4.1	0.09	-9	-9	-999	62	16.1	0.562	0.7	0.48	1.3	75	10	300.4	3	0	0	74	1015	0
5	4	7	97	8	61.6	0.243	-9	-9	-999	276	-21.2	0.212	0.48	0.25	1.9	89	10	302.8	3	0	0	67	1016	0
5	4	7	97	9	93.5	0.272	-9	-9	-999	326	-19.4	0.212	0.48	0.19	2.1	90	10	304.1	3	0	0	75	1016	6
5	4	7	97	10	120.9	0.279	-9	-9	-999	338	-16.2	0.212	0.48	0.18	2.1	96	10	305	3	0	0	56	1016	7
5	4	7	97	11	135.4	0.282	-9	-9	-999	344	-14.9	0.212	0.48	0.18	2.1	102	10	306.1	3	0	0	54	1015	7
5	4	7	97	12	137.1	0.31	-9	-9	-999	397	-19.7	0.212	0.48	0.18	2.4	107	10	306.2	3	0	0	56	1015	8
5	4	7	97	13	103.8	0.312	-9	-9	-999	401	-26.5	0.212	0.48	0.18	2.5	92	10	305.2	3	0	0	54	1014	9
5	4	7	97	14	106.4	0.313	-9	-9	-999	402	-25.9	0.212	0.48	0.18	2.5	102	10	304.6	3	0	0	52	1013	9
5	4	7	97	15	88.2	0.299	-9	-9	-999	376	-27.3	0.212	0.48	0.18	2.4	94	10	304.4	3	0	0	52	1012	9
5	4	7	97	16	45.8	0.265	-9	-9	-999	315	-36.9	0.212	0.48	0.19	2.2	95	10	304	3	0	0	55	1012	9
5	4	7	97	17	10.6	0.224	-9	-9	-999	245	-96.3	0.212	0.48	0.22	2	91	10	302.4	3	0	0	61	1012	10
5	4	7	97	18	0.1	0.177	-9	-9	-999	171	-4990.5	0.212	0.48	0.38	1.7	89	10	300.9	3	0	0	67	1013	7
5	4	7	97	19	-3.8	0.076	-9	-9	-999	54	10.7	0.562	0.7	1	1.1	75	10	299.9	3	0	0	72	1013	7
5	4	7	97	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	79	10	299.4	3	0	0	74	1013	7
5	4	7	97	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	93	10	298.8	3	0	0	74	1014	7
5	4	7	97	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	298.4	3	0	0	82	1014	7
5	4	7	97	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	298.2	3	0	0	82	1015	7
5	4	7	97	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	298	3	0	0	82	1014	7
5	4	8	98	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	297.8	3	0	0	88	1013	7
5	4	8	98	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	297.6	3	0	0	88	1012	7
5	4	8	98	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.4	3	0	0	82	1012	7
5	4	8	98	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	297.5	3	0	0	88	1012	7
5	4	8	98	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	297.8	3	0	0	88	1012	7
5	4	8	98	6	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	76	10	298.4	3	0	0	88	1013	7
5	4	8	98	7	-6.9	0.148	-9	-9	-999	131	42.5	0.562	0.7	0.48	1.5	79	10	300.6	3	0	0	82	1014	0
5	4	8	98	8	52.1	0.268	0.975	0.005	642	319	-33.4	0.212	0.48	0.25	2.2	87	10	302.6	3	0	0	75	1014	0
5	4	8	98	9	107.8	0.294	1.374	0.005	871	367	-21.3	0.212	0.48	0.19	2.3	86	10	304.5	3	0	0	65	1014	0
5	4	8	98	10	116.5	0.278	1.459	0.005	965	337	-16.6	0.212	0.48	0.18	2.1	98	10	305.1	3	0	0	61	1014	7
5	4	8	98	11	136.9	0.301	1.597	0.005	1077	379	-17.9	0.212	0.48	0.18	2.3	95	10	306.2	3	0	0	56	1014	7
5	4	8	98	12	134.1	0.309	1.638	0.005	1186	396	-19.9	0.212	0.48	0.18	2.4	92	10	306.4	3	0	0	56	1013	8
5	4	8	98	13	141.5	0.32	1.721	0.005	1301	417	-21	0.212	0.48	0.18	2.5	92	10	306.2	3	0	0	56	1012	7
5	4	8	98	14	134	0.328	1.736	0.006	1410	433	-23.8	0.212	0.48	0.18	2.6	88	10	306.2	3	0	0	52	1011	8
5	4	8	98	15	96	0.329	1.581	0.006	1486	434	-33.4	0.212	0.48	0.18	2.7	91	10	305.2	3	0	0	56	1011	8
5	4	8	98	16	53.1	0.325	1.31	0.006	1526	425	-57.9	0.212	0.48	0.19	2.8	97	10	304	3	0	0	56	1010	9
5	4	8	98	17	9	0.251	0.727	0.006	1528	292	-158.2	0.212	0.48	0.23	2.3	93	10	302.1	3	0	0	65	1011	10
5	4	8	98	18	0.1	0.187	0.162	0.006	1525	187	-5912.4	0.212	0.48	0.38	1.8	87	10	301	3	0	0	70	1012	7
5	4	8	98	19	-5.1	0.083	-9	-9	-999	60	10	0.212	0.48	1	1.6	96	10	300.4	3	0	0	82	1012	7
5	4	8	98	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	96	10	299.9	3	0	0	82	1013	0
5	4	8	98	21	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	102	10	299.9	3	0	0	82	1013	7
5	4	8	98	22	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	99	10	299.8	3	0	0	82	1014	7
5	4	8	98	23	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	102	10	299.5	3	0	0	82	1014	7
5	4	8	98	24	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	75	10	299	3	0	0	82	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	9	99	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	48	10	298.2	3	0	0	82	1013	3
5	4	9	99	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	53	10	297.9	3	0	0	82	1012	7
5	4	9	99	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	298	3	0	0	88	1012	3
5	4	9	99	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	298	3	0	0	88	1012	3
5	4	9	99	5	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	109	10	298.1	3	0	0	94	1012	7
5	4	9	99	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	107	10	299	3	0	0	88	1013	7
5	4	9	99	7	-3.3	0.078	-9	-9	-999	50	12.9	0.212	0.48	0.48	1.5	94	10	301.1	3	0	0	88	1014	0
5	4	9	99	8	55	0.269	1.077	0.007	822	321	-32.1	0.212	0.48	0.25	2.2	113	10	302.8	3	0	0	85	1014	0
5	4	9	99	9	100.6	0.311	1.344	0.007	875	400	-27.2	0.212	0.48	0.19	2.5	120	10	304.6	3	0	0	70	1015	0
5	4	9	99	10	125.4	0.317	1.482	0.007	941	410	-23	0.212	0.48	0.18	2.5	112	10	305.1	3	0	0	61	1014	6
5	4	9	99	11	148.4	0.322	1.61	0.007	1019	420	-20.3	0.212	0.48	0.18	2.5	105	10	305.5	3	0	0	59	1014	6
5	4	9	99	12	132.5	0.309	1.586	0.007	1090	395	-20.1	0.212	0.48	0.18	2.4	110	10	306.1	3	0	0	58	1013	8
5	4	9	99	13	84.8	0.344	1.385	0.007	1132	465	-43.5	0.212	0.48	0.18	2.9	112	10	303.2	3	0	0	58	1013	9
5	4	9	99	14	125.8	0.355	1.611	0.007	1200	486	-32	0.212	0.48	0.18	2.9	114	10	304.8	3	0	0	59	1012	8
5	4	9	99	15	82.1	0.325	1.414	0.006	1243	427	-37.7	0.212	0.48	0.18	2.7	107	10	304.2	3	0	0	59	1011	9
5	4	9	99	16	49.5	0.323	1.202	0.006	1266	422	-61.5	0.212	0.48	0.19	2.8	110	10	302.5	3	0	0	61	1011	9
5	4	9	99	17	14.7	0.257	0.803	0.006	1273	301	-103.8	0.212	0.48	0.23	2.3	109	10	302.1	3	0	0	63	1011	10
5	4	9	99	18	0.1	0.197	0.152	0.006	1271	203	-6946	0.212	0.48	0.38	1.9	111	10	300.9	3	0	0	74	1011	7
5	4	9	99	19	-3.9	0.073	-9	-9	-999	57	8.8	0.212	0.48	1	1.4	108	10	300.1	3	0	0	74	1012	7
5	4	9	99	20	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	106	10	299.9	3	0	0	88	1012	7
5	4	9	99	21	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	100	10	299.4	3	0	0	94	1013	7
5	4	9	99	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	100	10	298.9	3	0	0	94	1013	7
5	4	9	99	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	298.5	3	0	0	94	1013	7
5	4	9	99	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	298.1	3	0	0	94	1013	7
5	4	10	100	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	297.9	3	0	0	100	1012	7
5	4	10	100	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	115	10	297.8	3	0	0	97	1012	0
5	4	10	100	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	61	10	297.4	3	0	0	94	1011	3
5	4	10	100	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	296.9	3	0	0	94	1011	7
5	4	10	100	5	-4	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	102	10	298	3	0	0	94	1012	7
5	4	10	100	6	-7.3	0.099	-9	-9	-999	71	11.9	0.212	0.48	1	1.9	107	10	298	3	0	0	94	1012	7
5	4	10	100	7	-2.2	0.062	-9	-9	-999	36	10	0.212	0.48	0.47	1.2	110	10	298.6	3	0	0.25	88	1013	0
5	4	10	100	8	60.1	0.243	0.854	0.005	374	275	-21.5	0.212	0.48	0.25	1.9	111	10	301.8	3	0	0	91	1013	0
5	4	10	100	9	78.4	0.296	1.175	0.006	749	370	-29.9	0.212	0.48	0.19	2.4	118	10	302.9	3	0	0	85	1014	7
5	4	10	100	10	135	0.338	1.471	0.006	852	452	-25.8	0.212	0.48	0.18	2.7	119	10	303.9	3	0	0	85	1013	5
5	4	10	100	11	157.2	0.323	1.604	0.006	949	423	-19.4	0.212	0.48	0.18	2.5	107	10	305.4	3	0	0	75	1013	6
5	4	10	100	12	139.7	0.339	1.587	0.006	1035	454	-25.1	0.212	0.48	0.18	2.7	114	10	305.5	3	0	0	67	1012	8
5	4	10	100	13	112.7	0.314	1.511	0.006	1104	405	-24.8	0.212	0.48	0.18	2.5	117	10	305.4	3	0	0	59	1011	8
5	4	10	100	14	123.4	0.326	1.593	0.005	1181	428	-25.3	0.212	0.48	0.18	2.6	116	10	305.9	3	0	0	57	1010	8
5	4	10	100	15	74.7	0.304	1.364	0.005	1224	386	-33.9	0.212	0.48	0.18	2.5	120	10	304.4	3	0	0	55	1010	9
5	4	10	100	16	64.8	0.301	1.315	0.005	1263	380	-37.8	0.212	0.48	0.19	2.5	126	10	303.9	3	0	0	59	1009	9
5	4	10	100	17	12	0.235	0.751	0.005	1268	264	-97.3	0.212	0.48	0.23	2.1	121	10	302.5	3	0	0	65	1009	10
5	4	10	100	18	0.1	0.156	0.152	0.005	1264	144	-3427.4	0.212	0.48	0.38	1.5	109	10	300.6	3	0	0	70	1009	3
5	4	10	100	19	-5.1	0.078	-9	-9	-999	52	8.4	0.212	0.48	1	1.5	108	10	299.9	3	0	0	82	1010	3
5	4	10	100	20	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	108	10	299.4	3	0	0	88	1010	7
5	4	10	100	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	110	10	298.9	3	0	0	88	1011	7
5	4	10	100	22	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	105	10	298.6	3	0	0	88	1011	7
5	4	10	100	23	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	107	10	298.5	3	0	0	88	1011	7
5	4	10	100	24	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	113	10	298.4	3	0	0	88	1010	7
5	4	11	101	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	105	10	298.4	3	0	0	88	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	11	101	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	298	3	0	0	91	1010	7
5	4	11	101	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	81	10	297.8	3	0	0	94	1009	7
5	4	11	101	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	61	10	297.4	3	0	0	94	1009	7
5	4	11	101	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	297.4	3	0	0	94	1010	7
5	4	11	101	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	108	10	298.4	3	0	0	94	1010	7
5	4	11	101	7	-1.7	0.057	-9	-9	-999	31	10.1	0.212	0.48	0.47	1.1	104	10	301.4	3	0	0	94	1011	0
5	4	11	101	8	63.5	0.253	0.846	0.005	344	293	-23.1	0.212	0.48	0.24	2	119	10	302.9	3	0	0	85	1012	0
5	4	11	101	9	89.4	0.261	1.215	0.005	725	307	-18	0.212	0.48	0.19	2	126	10	304.4	3	0	0	83	1012	7
5	4	11	101	10	92.8	0.253	1.291	0.005	837	293	-15.7	0.212	0.48	0.18	1.9	139	10	305.2	3	0	0	66	1012	8
5	4	11	101	11	115.8	0.259	1.438	0.005	927	302	-13.5	0.212	0.48	0.18	1.9	131	10	305.8	3	0	0	58	1011	8
5	4	11	101	12	112.1	0.267	1.467	0.005	1017	318	-15.3	0.212	0.48	0.18	2	133	10	306.9	3	0	0	54	1010	9
5	4	11	101	13	133.3	0.281	1.607	0.005	1122	343	-15	0.212	0.48	0.18	2.1	133	10	307.4	3	0	0	47	1009	8
5	4	11	101	14	70	0.149	1.317	0.005	1175	141	-4.2	0.212	0.48	0.18	0.9	122	10	306.4	3	0	0	52	1008	10
5	4	11	101	15	62.4	0.288	1.283	0.005	1219	356	-34.5	0.562	0.7	0.18	1.7	344	10	303.5	3	0	0	56	1008	10
5	4	11	101	16	29.6	0.259	1.007	0.005	1241	303	-52.8	0.562	0.7	0.19	1.6	352	10	303	3	0	0	58	1008	10
5	4	11	101	17	5.2	0.218	0.565	0.005	1245	234	-178.1	0.212	0.48	0.23	2	103	10	302.9	3	0	0	65	1008	10
5	4	11	101	18	0.1	0.177	0.151	0.005	1241	171	-4973.9	0.212	0.48	0.38	1.7	109	10	301.4	3	0	0	74	1009	7
5	4	11	101	19	-4.5	0.078	-9	-9	-999	55	9.4	0.212	0.48	1	1.5	109	10	300.2	3	0	0	77	1009	7
5	4	11	101	20	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	112	10	299.8	3	0	0	85	1010	7
5	4	11	101	21	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	112	10	299.5	3	0	0	88	1011	7
5	4	11	101	22	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	111	10	299.6	3	0	0	88	1011	7
5	4	11	101	23	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	110	10	299.8	3	0	0	91	1011	7
5	4	11	101	24	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	116	10	299.5	3	0	0	94	1011	7
5	4	12	102	1	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	114	10	299.5	3	0	0	94	1010	7
5	4	12	102	2	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	115	10	299.4	3	0	0	94	1010	7
5	4	12	102	3	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	95	10	299.2	3	0	0	94	1010	7
5	4	12	102	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	298.9	3	0	0	94	1010	7
5	4	12	102	5	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	108	10	298.9	3	0	0	94	1010	7
5	4	12	102	6	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	98	10	299.5	3	0	0	94	1011	7
5	4	12	102	7	-3.8	0.11	-9	-9	-999	84	31	0.212	0.48	0.46	1.5	110	10	301.2	3	0	0	88	1012	0
5	4	12	102	8	54	0.26	-9	-9	-999	304	-29.2	0.212	0.48	0.24	2.1	118	10	303	3	0	0	82	1013	0
5	4	12	102	9	102.6	0.293	-9	-9	-999	365	-22.1	0.212	0.48	0.19	2.3	121	10	304.6	3	0	0	70	1013	5
5	4	12	102	10	109.5	0.267	-9	-9	-999	317	-15.6	0.212	0.48	0.18	2	126	10	305.9	3	0	0	61	1013	8
5	4	12	102	11	107.1	0.266	-9	-9	-999	316	-15.9	0.212	0.48	0.18	2	123	10	306.1	3	0	0	56	1013	8
5	4	12	102	12	133	0.281	-9	-9	-999	343	-15.1	0.212	0.48	0.18	2.1	121	10	307	3	0	0	56	1012	8
5	4	12	102	13	127.1	0.308	-9	-9	-999	393	-20.7	0.212	0.48	0.18	2.4	118	10	307	3	0	0	54	1011	8
5	4	12	102	14	110.5	0.285	-9	-9	-999	351	-19	0.212	0.48	0.18	2.2	120	10	306.9	3	0	0	52	1010	8
5	4	12	102	15	74	0.285	-9	-9	-999	351	-28.2	0.212	0.48	0.18	2.3	109	10	305.9	3	0	0	58	1010	9
5	4	12	102	16	47.6	0.276	-9	-9	-999	333	-39.6	0.212	0.48	0.19	2.3	107	10	304.8	3	0	0	58	1010	9
5	4	12	102	17	15.1	0.248	-9	-9	-999	283	-90.5	0.212	0.48	0.23	2.2	114	10	303	3	0	0	65	1010	10
5	4	12	102	18	0.1	0.197	-9	-9	-999	202	-6946	0.212	0.48	0.38	1.9	108	10	301.4	3	0	0	70	1011	7
5	4	12	102	19	-5.1	0.083	-9	-9	-999	63	10	0.212	0.48	1	1.6	116	10	300.5	3	0	0	79	1012	7
5	4	12	102	20	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	116	10	300	3	0	0	82	1013	3
5	4	12	102	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	113	10	299.6	3	0	0	82	1013	3
5	4	12	102	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	110	10	299.2	3	0	0	82	1013	3
5	4	12	102	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	298.9	3	0	0	85	1013	0
5	4	12	102	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	63	10	298.4	3	0	0	88	1013	7
5	4	13	103	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	298	3	0	0	88	1012	7
5	4	13	103	2	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	90	10	298	3	0	0	91	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	13	103	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	50	10	297.8	3	0	0	88	1011	7
5	4	13	103	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	45	10	297.2	3	0	0	88	1012	7
5	4	13	103	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	71	10	297.4	3	0	0	91	1012	7
5	4	13	103	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	298.4	3	0	0	94	1013	7
5	4	13	103	7	-3.5	0.106	-9	-9	-999	79	30	0.562	0.7	0.46	1.2	78	10	300.8	3	0	0	88	1013	0
5	4	13	103	8	56.9	0.261	0.873	0.005	423	306	-28.1	0.212	0.48	0.24	2.1	106	10	303.1	3	0	0	80	1014	0
5	4	13	103	9	79.1	0.287	1.195	0.005	781	353	-27	0.212	0.48	0.19	2.3	105	10	304.1	3	0	0	70	1014	7
5	4	13	103	10	74.5	0.304	1.224	0.005	891	385	-34.1	0.212	0.48	0.18	2.5	112	10	304	3	0	0	61	1014	9
5	4	13	103	11	102.9	0.34	1.435	0.005	1039	456	-34.5	0.212	0.48	0.18	2.8	103	10	303.9	3	0	0	59	1014	8
5	4	13	103	12	107.9	0.323	1.528	0.006	1197	422	-28.1	0.212	0.48	0.18	2.6	104	10	304.5	3	0	0	63	1013	9
5	4	13	103	13	97.4	0.329	1.524	0.007	1313	435	-33.1	0.212	0.48	0.18	2.7	108	10	304.5	3	0	0	54	1012	9
5	4	13	103	14	73.1	0.304	1.398	0.007	1349	385	-34.5	0.212	0.48	0.18	2.5	110	10	303.9	3	0	0	57	1012	9
5	4	13	103	15	71.5	0.284	1.397	0.008	1378	349	-29	0.212	0.48	0.18	2.3	109	10	303.9	3	0	0	59	1011	9
5	4	13	103	16	33.6	0.259	1.09	0.008	1390	304	-46.8	0.212	0.48	0.19	2.2	104	10	303	3	0	0	63	1011	10
5	4	13	103	17	10.4	0.234	0.738	0.008	1393	260	-110.4	0.212	0.48	0.23	2.1	108	10	302	3	0	0	63	1012	10
5	4	13	103	18	0.1	0.166	0.157	0.008	1392	157	-4162.8	0.212	0.48	0.38	1.6	107	10	300.9	3	0	0	70	1012	7
5	4	13	103	19	-2.4	0.057	-9	-9	-999	41	6.9	0.212	0.48	1	1.1	89	10	300.1	3	0	0	79	1012	7
5	4	13	103	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	94	10	299.5	3	0	0	85	1013	7
5	4	13	103	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	79	10	299	3	0	0	88	1013	7
5	4	13	103	22	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	84	10	298.9	3	0	0	82	1013	7
5	4	13	103	23	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	95	10	298.9	3	0	0	82	1013	0
5	4	13	103	24	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	108	10	298.8	3	0	0	82	1013	7
5	4	14	104	1	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	108	10	298.6	3	0	0	85	1012	7
5	4	14	104	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	104	10	298.4	3	0	0	88	1012	0
5	4	14	104	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	298.4	3	0	0	88	1012	7
5	4	14	104	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	98	10	298	3	0	0	88	1012	7
5	4	14	104	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	98	10	298.1	3	0	0	91	1012	0
5	4	14	104	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	99	10	298.9	3	0	0	88	1013	7
5	4	14	104	7	-4	0.134	-9	-9	-999	113	55.1	0.212	0.48	0.46	1.6	108	10	301.4	3	0	0	88	1013	0
5	4	14	104	8	51.1	0.277	-9	-9	-999	335	-37.6	0.212	0.48	0.24	2.3	123	10	302.9	3	0	0	79	1014	6
5	4	14	104	9	102.5	0.312	-9	-9	-999	401	-26.8	0.212	0.48	0.19	2.5	120	10	304.6	3	0	0	70	1014	4
5	4	14	104	10	107.7	0.341	-9	-9	-999	458	-33.3	0.212	0.48	0.18	2.8	115	10	305.1	3	0	0	61	1014	8
5	4	14	104	11	100.4	0.33	-9	-9	-999	436	-32.3	0.212	0.48	0.18	2.7	112	10	304.8	3	0	0	58	1013	9
5	4	14	104	12	156.2	0.38	-9	-9	-999	538	-31.7	0.212	0.48	0.18	3.1	118	10	305.8	3	0	0	56	1013	7
5	4	14	104	13	105.5	0.35	-9	-9	-999	477	-36.7	0.212	0.48	0.18	2.9	122	10	305.6	3	0	0	52	1012	9
5	4	14	104	14	100.7	0.34	-9	-9	-999	455	-35.1	0.212	0.48	0.18	2.8	115	10	305.1	3	0	0	56	1011	9
5	4	14	104	15	81	0.343	-9	-9	-999	462	-44.9	0.212	0.48	0.18	2.9	125	10	305	3	0	0	52	1011	9
5	4	14	104	16	44.4	0.312	-9	-9	-999	401	-61.3	0.212	0.48	0.19	2.7	118	10	304.1	3	0	0	52	1010	10
5	4	14	104	17	12.1	0.264	-9	-9	-999	313	-137.3	0.212	0.48	0.23	2.4	118	10	302.6	3	0	0	61	1011	10
5	4	14	104	18	0.1	0.197	-9	-9	-999	203	-6946	0.212	0.48	0.38	1.9	116	10	301.2	3	0	0	70	1011	7
5	4	14	104	19	-3.4	0.067	-9	-9	-999	55	8.2	0.212	0.48	1	1.3	113	10	300.4	3	0	0	77	1012	7
5	4	14	104	20	-4.5	0.073	-9	-9	-999	45	7.6	0.212	0.48	1	1.4	118	10	300	3	0	0	85	1012	0
5	4	14	104	21	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	117	10	299.4	3	0	0	88	1013	7
5	4	14	104	22	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	108	10	299.2	3	0	0	88	1013	7
5	4	14	104	23	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	108	10	299	3	0	0	88	1012	0
5	4	14	104	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	298.8	3	0	0	82	1012	7
5	4	15	105	1	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	89	10	298.4	3	0	0	94	1012	3
5	4	15	105	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	106	10	298.4	3	0	0	91	1011	0
5	4	15	105	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	117	10	298.1	3	0	0	88	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	15	105	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	105	10	297.9	3	0	0	88	1012	3
5	4	15	105	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	66	10	297.5	3	0	0	94	1012	0
5	4	15	105	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	298.4	3	0	0	88	1013	7
5	4	15	105	7	-1.4	0.057	-9	-9	-999	31	11.8	0.212	0.48	0.45	1.1	115	10	301.2	3	0	0	88	1013	0
5	4	15	105	8	59.7	0.243	0.896	0.005	436	275	-21.6	0.212	0.48	0.24	1.9	122	10	303	3	0	0	77	1014	0
5	4	15	105	9	53.9	0.24	1.013	0.005	696	271	-23.3	0.212	0.48	0.19	1.9	134	10	303.2	3	0	0	63	1014	9
5	4	15	105	10	80.4	0.278	1.238	0.005	852	336	-24	0.212	0.48	0.18	2.2	139	10	304	3	0	0	56	1014	9
5	4	15	105	11	130.1	0.435	1.522	0.005	980	659	-57.1	0.687	0.8	0.18	2.5	150	10	302.9	3	0	0	56	1013	9
5	4	15	105	12	130.7	0.328	1.59	0.005	1113	438	-24.3	0.212	0.48	0.18	2.6	135	10	305.4	3	0	0	54	1013	8
5	4	15	105	13	134.1	0.347	1.667	0.005	1249	471	-28.2	0.212	0.48	0.18	2.8	131	10	306.2	3	0	0	50	1012	8
5	4	15	105	14	126.6	0.346	1.69	0.007	1376	468	-29.4	0.212	0.48	0.18	2.8	130	10	306.4	3	0	0	54	1011	8
5	4	15	105	15	70.7	0.303	1.414	0.009	1444	384	-35.4	0.212	0.48	0.18	2.5	118	10	305.1	3	0	0	58	1011	9
5	4	15	105	16	46	0.293	1.238	0.01	1488	366	-49.5	0.212	0.48	0.19	2.5	130	10	304.4	3	0	0	59	1011	10
5	4	15	105	17	13.7	0.265	0.829	0.01	1498	315	-122.8	0.212	0.48	0.23	2.4	128	10	303.1	3	0	0	63	1011	10
5	4	15	105	18	0.1	0.166	0.161	0.01	1492	160	-4162.8	0.212	0.48	0.38	1.6	115	10	301.4	3	0	0	67	1012	3
5	4	15	105	19	-4.4	0.073	-9	-9	-999	49	7.8	0.212	0.48	1	1.4	110	10	300.2	3	0	0	77	1012	3
5	4	15	105	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	110	10	299.4	3	0	0	82	1013	3
5	4	15	105	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	108	10	298.9	3	0	0	999	1014	3
5	4	15	105	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	106	10	298.6	3	0	0	999	1014	99
5	4	15	105	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	81	10	298.4	3	0	0	999	1014	99
5	4	15	105	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	58	10	297.6	3	0	0	999	1013	99
5	4	16	106	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	73	10	297.4	3	0	0	999	1013	99
5	4	16	106	2	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	78	10	297.4	3	0	0	999	1013	99
5	4	16	106	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	65	10	296.9	3	0	0	94	1012	3
5	4	16	106	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	296.9	3	0	0	100	1013	3
5	4	16	106	5	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	82	10	297.4	3	0	0	94	1013	3
5	4	16	106	6	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	90	10	298.5	3	0	0	94	1014	3
5	4	16	106	7	-3.6	0.14	-9	-9	-999	120	69	0.212	0.48	0.45	1.6	106	10	301	3	0	0	94	1015	0
5	4	16	106	8	61	0.281	1.018	0.005	626	342	-32.8	0.212	0.48	0.24	2.3	116	10	302.8	3	0	0	77	1015	0
5	4	16	106	9	103.5	0.293	1.349	0.005	859	365	-22	0.212	0.48	0.19	2.3	114	10	304.4	3	0	0	65	1015	0
5	4	16	106	10	138.9	0.282	1.564	0.005	998	345	-14.7	0.212	0.48	0.18	2.1	110	10	305.5	3	0	0	63	1015	5
5	4	16	106	11	148.8	0.284	1.677	0.006	1148	349	-14	0.212	0.48	0.18	2.1	108	10	306.1	3	0	0	52	1015	7
5	4	16	106	12	149.2	0.275	1.75	0.008	1300	332	-12.6	0.212	0.48	0.18	2	102	10	306.8	3	0	0	52	1014	7
5	4	16	106	13	144.8	0.293	1.775	0.008	1398	365	-15.7	0.212	0.48	0.18	2.2	114	10	306.9	3	0	0	52	1013	7
5	4	16	106	14	107.2	0.275	1.62	0.009	1434	332	-17.5	0.212	0.48	0.18	2.1	113	10	306.2	3	0	0	54	1012	8
5	4	16	106	15	93.3	0.281	1.559	0.009	1469	343	-21.5	0.212	0.48	0.18	2.2	107	10	305.9	3	0	0	47	1012	8
5	4	16	106	16	53.4	0.25	1.301	0.009	1488	288	-26.4	0.212	0.48	0.19	2	110	10	304.6	3	0	0	52	1012	9
5	4	16	106	17	14.9	0.228	0.852	0.009	1491	251	-71.8	0.212	0.48	0.23	2	110	10	302.8	3	0	0	53	1012	10
5	4	16	106	18	0.1	0.177	0.161	0.009	1488	171	-4988.8	0.212	0.48	0.38	1.7	104	10	300.8	3	0	0	63	1012	3
5	4	16	106	19	-2.4	0.057	-9	-9	-999	44	6.9	0.212	0.48	1	1.1	104	10	299.6	3	0	0	74	1013	7
5	4	16	106	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	94	10	298.8	3	0	0	79	1013	3
5	4	16	106	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	105	10	298	3	0	0	85	1014	3
5	4	16	106	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	99	10	297.8	3	0	0	85	1015	7
5	4	16	106	23	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	90	10	297.4	3	0	0	87	1014	0
5	4	16	106	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	297	3	0	0	90	1014	7
5	4	17	107	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	63	10	296.4	3	0	0	90	1013	7
5	4	17	107	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	78	10	296.2	3	0	0	90	1013	0
5	4	17	107	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	71	10	296.2	3	0	0	90	1013	7
5	4	17	107	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	42	10	296	3	0	0	97	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	17	107	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	64	10	295.9	3	0	0	97	1014	0
5	4	17	107	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	297	3	0	0	97	1014	7
5	4	17	107	7	-3.3	0.129	-9	-9	-999	107	60.2	0.562	0.7	0.45	1.2	82	10	300.1	3	0	0	90	1014	0
5	4	17	107	8	63.7	0.253	-9	-9	-999	293	-23.1	0.212	0.48	0.24	2	88	10	302.4	3	0	0	74	1015	0
5	4	17	107	9	69.9	0.246	-9	-9	-999	281	-19.3	0.212	0.48	0.19	1.9	114	10	302.9	3	0	0	59	1015	8
5	4	17	107	10	141.6	0.311	-9	-9	-999	399	-19.2	0.212	0.48	0.18	2.4	107	10	305	3	0	0	55	1015	4
5	4	17	107	11	133.5	0.319	-9	-9	-999	414	-21.9	0.212	0.48	0.18	2.5	114	10	305.4	3	0	0	44	1015	7
5	4	17	107	12	156.6	0.295	-9	-9	-999	369	-14.9	0.212	0.48	0.18	2.2	112	10	306.5	3	0	0	44	1014	7
5	4	17	107	13	117.7	0.268	-9	-9	-999	320	-14.8	0.212	0.48	0.18	2	106	10	306.2	3	0	0	47	1013	8
5	4	17	107	14	126.9	0.251	-9	-9	-999	289	-11.2	0.212	0.48	0.18	1.8	105	10	306.9	3	0	0	43	1012	8
5	4	17	107	15	96.7	0.254	-9	-9	-999	294	-15.3	0.212	0.48	0.18	1.9	106	10	306.6	3	0	0	45	1011	8
5	4	17	107	16	53.7	0.259	-9	-9	-999	304	-29.3	0.212	0.48	0.19	2.1	103	10	305.2	3	0	0	49	1011	9
5	4	17	107	17	18.2	0.24	-9	-9	-999	271	-68.8	0.212	0.48	0.23	2.1	102	10	303.6	3	0	0	54	1011	10
5	4	17	107	18	0.1	0.187	-9	-9	-999	187	-5912.4	0.212	0.48	0.38	1.8	96	10	301.6	3	0	0	63	1012	3
5	4	17	107	19	-4.4	0.073	-9	-9	-999	54	7.8	0.212	0.48	1	1.4	91	10	300.2	3	0	0	72	1012	3
5	4	17	107	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	93	10	299.4	3	0	0	77	1013	3
5	4	17	107	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	92	10	298.9	3	0	0	82	1013	3
5	4	17	107	22	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	83	10	298.4	3	0	0	88	1013	3
5	4	17	107	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	88	10	298.1	3	0	0	88	1013	3
5	4	17	107	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	297.6	3	0	0	88	1013	3
5	4	18	108	1	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	56	10	297.2	3	0	0	88	1012	7
5	4	18	108	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	297	3	0	0	94	1011	3
5	4	18	108	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	89	10	297.2	3	0	0	88	1011	3
5	4	18	108	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	59	10	296.9	3	0	0	94	1011	3
5	4	18	108	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	45	10	296.5	3	0	0	94	1012	3
5	4	18	108	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	63	10	297.9	3	0	0	90	1012	7
5	4	18	108	7	-2.9	0.138	-9	-9	-999	118	82.8	0.562	0.7	0.44	1.2	83	10	300.9	3	0	0	88	1013	0
5	4	18	108	8	69.6	0.236	-9	-9	-999	264	-17.2	0.212	0.48	0.24	1.8	100	10	303.1	3	0	0	74	1013	0
5	4	18	108	9	105.4	0.266	-9	-9	-999	315	-16.1	0.212	0.48	0.19	2	110	10	304.8	3	0	0	59	1013	2
5	4	18	108	10	106.3	0.266	-9	-9	-999	315	-16	0.212	0.48	0.18	2	106	10	305.4	3	0	0	59	1013	8
5	4	18	108	11	87.5	0.261	-9	-9	-999	306	-18.3	0.212	0.48	0.18	2	120	10	305.6	3	0	0	49	1013	9
5	4	18	108	12	93.4	0.262	-9	-9	-999	309	-17.4	0.212	0.48	0.18	2	111	10	305.4	3	0	0	50	1012	9
5	4	18	108	13	102.5	0.265	-9	-9	-999	314	-16.4	0.212	0.48	0.18	2	111	10	305.6	3	0	0	52	1011	9
5	4	18	108	14	68.1	0.246	-9	-9	-999	280	-19.6	0.212	0.48	0.18	1.9	110	10	305.5	3	0	0	52	1010	10
5	4	18	108	15	60	0.271	-9	-9	-999	325	-29.9	0.212	0.48	0.18	2.2	118	10	304.6	3	0	0	50	1009	10
5	4	18	108	16	31.1	0.23	-9	-9	-999	254	-35.3	0.212	0.48	0.19	1.9	106	10	303.9	3	0	0	59	1009	10
5	4	18	108	17	3.5	0.235	-9	-9	-999	261	-336.5	0.212	0.48	0.23	2.2	124	10	302.2	3	0	0	63	1010	10
5	4	18	108	18	0.1	0.177	-9	-9	-999	172	-4980.5	0.212	0.48	0.38	1.7	122	10	300.4	3	0	0	67	1010	7
5	4	18	108	19	-7.3	0.099	-9	-9	-999	73	11.9	0.212	0.48	1	1.9	121	10	299.5	3	0	0	74	1012	7
5	4	18	108	20	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	110	10	298.9	3	0	0	79	1012	7
5	4	18	108	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	299.1	3	0	0	82	1012	3
5	4	18	108	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	299	3	0	0	82	1012	3
5	4	18	108	23	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	298.5	3	0	0	82	1012	3
5	4	18	108	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	105	10	298.1	3	0	0	82	1012	3
5	4	19	109	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	106	10	298	3	0	0	82	1011	3
5	4	19	109	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	101	10	298	3	0	0	94	1011	0
5	4	19	109	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	105	10	298.4	3	0	0	88	1011	3
5	4	19	109	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	298.4	3	0	0	88	1011	7
5	4	19	109	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	59	10	298.2	3	0	0	91	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	19	109	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	298.6	3	0	0	82	1012	7
5	4	19	109	7	-1.5	0.073	-9	-9	-999	45	22.7	0.212	0.48	0.44	1.1	98	10	299.9	3	0	0	82	1013	0
5	4	19	109	8	58.3	0.223	-9	-9	-999	243	-17.2	0.212	0.48	0.24	1.7	108	10	302.4	3	0	0	79	1013	0
5	4	19	109	9	105.6	0.256	-9	-9	-999	298	-14.4	0.212	0.48	0.19	1.9	109	10	304.9	3	0	0	67	1013	3
5	4	19	109	10	133.3	0.262	-9	-9	-999	309	-12.2	0.212	0.48	0.18	1.9	118	10	305.9	3	0	0	56	1013	6
5	4	19	109	11	134.2	0.252	-9	-9	-999	292	-10.8	0.212	0.48	0.18	1.8	114	10	306.6	3	0	0	50	1012	7
5	4	19	109	12	131.5	0.252	-9	-9	-999	291	-11	0.212	0.48	0.18	1.8	118	10	306.9	3	0	0	52	1012	8
5	4	19	109	13	122.6	0.221	-9	-9	-999	240	-8	0.212	0.48	0.18	1.5	121	10	307	3	0	0	54	1010	8
5	4	19	109	14	94.6	0.168	-9	-9	-999	160	-4.5	0.562	0.7	0.18	0.7	33	10	306.4	3	0	0	49	1010	9
5	4	19	109	15	127.7	0.272	-9	-9	-999	326	-14.1	0.562	0.7	0.18	1.4	344	10	305.4	3	0	0	56	1009	8
5	4	19	109	16	27.1	0.219	-9	-9	-999	236	-34.6	0.212	0.48	0.19	1.8	118	10	304.9	3	0	0	56	1009	10
5	4	19	109	17	8.1	0.202	-9	-9	-999	209	-92.1	0.212	0.48	0.23	1.8	113	10	303.1	3	0	0	55	1009	10
5	4	19	109	18	0.1	0.197	-9	-9	-999	202	-6939	0.212	0.48	0.38	1.9	118	10	301.6	3	0	0	63	1010	7
5	4	19	109	19	-3.9	0.073	-9	-9	-999	57	8.8	0.212	0.48	1	1.4	114	10	300.6	3	0	0	77	1010	7
5	4	19	109	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	109	10	300	3	0	0	79	1011	0
5	4	19	109	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	102	10	299.8	3	0	0	82	1012	7
5	4	19	109	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	108	10	299.5	3	0	0	83	1013	7
5	4	19	109	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	102	10	299.5	3	0	0	85	1012	7
5	4	19	109	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	299.4	3	0	0	88	1012	7
5	4	20	110	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	65	10	299.1	3	0	0	88	1011	7
5	4	20	110	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	55	10	298.9	3	0	0	88	1011	7
5	4	20	110	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	298.6	3	0	0	88	1011	3
5	4	20	110	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.6	3	0	0	94	1011	7
5	4	20	110	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	53	10	298.5	3	0	0	91	1012	7
5	4	20	110	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	299.2	3	0	0	88	1012	7
5	4	20	110	7	-0.9	0.056	-9	-9	-999	30	17.2	0.562	0.7	0.44	0.8	72	10	300.9	3	0	0	82	1013	0
5	4	20	110	8	43.4	0.18	-9	-9	-999	175	-12.1	0.212	0.48	0.24	1.3	121	10	302.8	3	0	0	80	1013	8
5	4	20	110	9	100.1	0.226	-9	-9	-999	247	-10.4	0.212	0.48	0.19	1.6	127	10	304.9	3	0	0	70	1013	6
5	4	20	110	10	105.1	0.217	-9	-9	-999	233	-8.8	0.212	0.48	0.18	1.5	131	10	305.9	3	0	0	66	1013	8
5	4	20	110	11	66.9	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	305.1	3	0	0	60	1013	10
5	4	20	110	12	72	0.317	-9	-9	-999	410	-39.8	0.562	0.7	0.18	1.9	342	10	303.4	3	0	0	54	1012	10
5	4	20	110	13	29.5	0.283	-9	-9	-999	348	-69.6	0.562	0.7	0.18	1.8	355	10	302.2	3	0	4.06	52	1011	10
5	4	20	110	14	12.7	0.161	-9	-9	-999	155	-29.3	0.212	0.48	0.18	1.3	100	10	298.8	3	0	13.72	57	1010	10
5	4	20	110	15	22.3	0.128	-9	-9	-999	105	-8.4	0.562	0.7	0.18	0.6	64	10	299.8	3	0	0.25	70	1010	10
5	4	20	110	16	24.2	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	300.9	3	0	0	70	1010	10
5	4	20	110	17	5.7	0.104	-9	-9	-999	78	-18	0.212	0.48	0.23	0.8	106	10	301	3	0	0	67	1010	10
5	4	20	110	18	0.1	0.115	-9	-9	-999	90	-1369.8	0.212	0.48	0.38	1.1	109	10	300.1	3	0	0	70	1010	7
5	4	20	110	19	-1.3	0.042	-9	-9	-999	22	5	0.212	0.48	1	0.8	97	10	299.6	3	0	0	74	1011	7
5	4	20	110	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	95	10	299.4	3	0	0	79	1011	7
5	4	20	110	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	299.1	3	0	0	82	1012	7
5	4	20	110	22	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	124	10	299.4	3	0	0	88	1012	7
5	4	20	110	23	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	111	10	299.4	3	0	0	88	1012	7
5	4	20	110	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	299.1	3	0	0	88	1012	7
5	4	21	111	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	298.9	3	0	0	88	1011	7
5	4	21	111	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	107	10	299.1	3	0	0	85	1011	7
5	4	21	111	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	104	10	299	3	0	0	88	1010	7
5	4	21	111	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	111	10	298.9	3	0	0	88	1010	7
5	4	21	111	5	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	113	10	298.9	3	0	0	88	1011	7
5	4	21	111	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	112	10	299.8	3	0	0	88	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	21	111	7	-1.9	0.167	-9	-9	-999	157	225.1	0.212	0.48	0.44	1.7	119	10	301.9	3	0	0	88	1012	0
5	4	21	111	8	55.4	0.269	-9	-9	-999	322	-31.9	0.212	0.48	0.24	2.2	130	10	302.9	3	0	0	88	1013	5
5	4	21	111	9	83.7	0.26	-9	-9	-999	304	-18.9	0.212	0.48	0.19	2	126	10	304.4	3	0	0	61	1013	7
5	4	21	111	10	115.3	0.268	-9	-9	-999	319	-15.1	0.212	0.48	0.18	2	129	10	305.6	3	0	0	56	1013	7
5	4	21	111	11	128	0.261	-9	-9	-999	307	-12.6	0.212	0.48	0.18	1.9	126	10	306.2	3	0	0	50	1012	8
5	4	21	111	12	110.7	0.228	-9	-9	-999	251	-9.7	0.212	0.48	0.18	1.6	129	10	306.9	3	0	0	48	1011	9
5	4	21	111	13	59.6	0.124	-9	-9	-999	105	-2.9	0.212	0.48	0.18	0.7	88	10	306.4	3	0	0	47	1010	10
5	4	21	111	14	81.9	0.333	-9	-9	-999	442	-40.5	0.562	0.7	0.18	2	343	10	304.2	3	0	0	51	1009	10
5	4	21	111	15	101	0.29	-9	-9	-999	360	-21.7	0.562	0.7	0.18	1.6	342	10	304.9	3	0	0	41	1008	9
5	4	21	111	16	27	0.113	-9	-9	-999	116	-4.8	0.212	0.48	0.19	0.7	98	10	304.8	3	0	0	50	1008	10
5	4	21	111	17	8.4	0.203	-9	-9	-999	210	-88.7	0.212	0.48	0.23	1.8	115	10	303.9	3	0	0	52	1008	10
5	4	21	111	18	0.1	0.156	-9	-9	-999	142	-3426.2	0.212	0.48	0.38	1.5	111	10	301.8	3	0	0	63	1009	7
5	4	21	111	19	-5.8	0.083	-9	-9	-999	56	8.9	0.212	0.48	1	1.6	113	10	300.4	3	0	0	74	1010	3
5	4	21	111	20	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	109	10	299.8	3	0	0	79	1011	7
5	4	21	111	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	110	10	299.4	3	0	0	82	1012	3
5	4	21	111	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	299	3	0	0	82	1012	3
5	4	21	111	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	106	10	298.9	3	0	0	85	1011	0
5	4	21	111	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	93	10	299	3	0	0	88	1010	7
5	4	22	112	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	93	10	298.9	3	0	0	88	1010	7
5	4	22	112	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	106	10	298.9	3	0	0	91	1010	7
5	4	22	112	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	298.9	3	0	0	94	1010	3
5	4	22	112	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	103	10	298.9	3	0	0	94	1010	7
5	4	22	112	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	94	10	299	3	0	0	88	1010	7
5	4	22	112	6	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	112	10	299.8	3	0	0	88	1011	7
5	4	22	112	7	5	0.159	0.443	0.005	629	146	-73.6	0.212	0.48	0.43	1.4	123	10	301.1	3	0	0	82	1012	5
5	4	22	112	8	53.2	0.269	1.043	0.005	770	320	-32.8	0.212	0.48	0.24	2.2	136	10	303	3	0	0	70	1012	0
5	4	22	112	9	132.8	0.449	1.506	0.005	930	691	-61.4	0.687	0.8	0.19	2.6	140	10	304.6	3	0	0	62	1012	6
5	4	22	112	10	112.8	0.377	1.489	0.007	1058	535	-42.8	0.687	0.8	0.18	2.1	155	10	304.9	3	0	0	60	1012	9
5	4	22	112	11	144.2	0.425	1.686	0.007	1201	638	-48.2	0.687	0.8	0.18	2.4	155	10	305.6	3	0	0	68	1012	8
5	4	22	112	12	128.2	0.408	1.649	0.007	1263	599	-47.6	0.687	0.8	0.18	2.3	164	10	305.9	3	0	0	80	1011	9
5	4	22	112	13	164.2	0.536	1.827	0.006	1341	901	-84.3	0.687	0.8	0.18	3.2	161	10	304.9	3	0	0	60	1010	8
5	4	22	112	14	86.1	0.421	1.488	0.006	1381	638	-78.1	0.687	0.8	0.18	2.5	143	10	304	3	0	0	56	1009	10
5	4	22	112	15	37.3	0.289	1.131	0.006	1398	369	-58.6	0.212	0.48	0.18	2.5	135	10	303.8	3	0	0	61	1009	10
5	4	22	112	16	25.9	0.353	1.005	0.006	1410	483	-153.2	0.687	0.8	0.19	2.2	140	10	303.2	3	0	0	65	1009	10
5	4	22	112	17	0.6	0.189	0.283	0.006	1409	206	-1041.4	0.212	0.48	0.23	1.8	119	10	302.1	3	0	0	65	1009	10
5	4	22	112	18	0.1	0.146	0.158	0.006	1408	129	-2792.8	0.212	0.48	0.38	1.4	119	10	301.4	3	0	0	75	1010	7
5	4	22	112	19	-2.9	0.062	-9	-9	-999	39	7.5	0.212	0.48	1	1.2	115	10	300.9	3	0	0	79	1010	7
5	4	22	112	20	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	118	10	300.8	3	0	0	85	1011	7
5	4	22	112	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	108	10	300.5	3	0	0	80	1012	7
5	4	22	112	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	300.4	3	0	0	88	1013	7
5	4	22	112	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	96	10	300	3	0	0	88	1012	7
5	4	22	112	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	93	10	300	3	0	0	88	1012	7
5	4	23	113	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	299.8	3	0	0	94	1011	7
5	4	23	113	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	111	10	299.4	3	0	0	94	1010	7
5	4	23	113	3	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	131	10	299.8	3	0	0	94	1010	7
5	4	23	113	4	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	134	10	299.9	3	0	0	94	1011	7
5	4	23	113	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	125	10	299.8	3	0	0	91	1011	7
5	4	23	113	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	130	10	300.1	3	0	0	94	1012	7
5	4	23	113	7	-1.1	0.182	-9	-9	-999	179	506.9	0.212	0.48	0.43	1.8	130	10	302	3	0	0	88	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	23	113	8	94.2	0.358	1.31	0.005	862	492	-43.9	0.687	0.8	0.24	2	144	10	303.8	3	0	0	80	1013	0
5	4	23	113	9	137.2	0.383	1.546	0.005	974	546	-37.1	0.687	0.8	0.19	2.1	152	10	305.1	3	0	0	66	1013	6
5	4	23	113	10	152	0.387	1.666	0.005	1099	554	-34.4	0.687	0.8	0.18	2.1	150	10	305.9	3	0	0	56	1013	7
5	4	23	113	11	120.3	0.379	1.587	0.005	1201	536	-40.8	0.687	0.8	0.18	2.1	148	10	306.4	3	0	0	56	1012	9
5	4	23	113	12	179.6	0.446	1.889	0.007	1356	685	-44.6	0.687	0.8	0.18	2.5	158	10	306.4	3	0	0	56	1011	8
5	4	23	113	13	169.8	0.418	1.92	0.008	1505	622	-38.7	0.687	0.8	0.18	2.3	158	10	306.9	3	0	0	56	1010	8
5	4	23	113	14	77.4	0.365	1.526	0.01	1654	510	-56.7	0.687	0.8	0.18	2.1	140	10	306.2	3	0	0	56	1009	10
5	4	23	113	15	62	0.3	1.421	0.01	1669	380	-39.2	0.212	0.48	0.18	2.5	136	10	305.6	3	0	0	62	1009	9
5	4	23	113	16	49.3	0.286	1.319	0.01	1678	351	-42.6	0.212	0.48	0.19	2.4	135	10	305.1	3	0	0	58	1009	9
5	4	23	113	17	9.5	0.223	0.762	0.01	1678	243	-105.2	0.212	0.48	0.23	2	124	10	303.1	3	0	0	63	1010	10
5	4	23	113	18	0.1	0.166	0.167	0.01	1677	157	-4158.7	0.212	0.48	0.38	1.6	113	10	301.8	3	0	0	75	1011	7
5	4	23	113	19	-5.8	0.083	-9	-9	-999	57	8.9	0.212	0.48	1	1.6	119	10	301.1	3	0	0	79	1011	3
5	4	23	113	20	-3.4	0.067	-9	-9	-999	40	8.2	0.212	0.48	1	1.3	112	10	300.9	3	0	0	82	1012	7
5	4	23	113	21	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	114	10	300.5	3	0	0	79	1013	7
5	4	23	113	22	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	110	10	300.2	3	0	0	79	1013	3
5	4	23	113	23	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	103	10	300	3	0	0	85	1013	3
5	4	23	113	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	110	10	299.5	3	0	0	88	1012	3
5	4	24	114	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	299.2	3	0	0	88	1011	3
5	4	24	114	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	299.1	3	0	0	88	1011	0
5	4	24	114	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	118	10	299	3	0	0	88	1011	7
5	4	24	114	4	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	121	10	299.4	3	0	0	88	1012	7
5	4	24	114	5	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	116	10	299.4	3	0	0	94	1012	0
5	4	24	114	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	113	10	300.4	3	0	0	94	1013	7
5	4	24	114	7	-0.6	0.184	-9	-9	-999	182	899.6	0.212	0.48	0.43	1.8	124	10	301.9	3	0	0	88	1014	0
5	4	24	114	8	60.4	0.271	1.142	0.005	892	325	-29.9	0.212	0.48	0.24	2.2	125	10	303.2	3	0	0	75	1014	0
5	4	24	114	9	88.4	0.242	1.361	0.008	1032	275	-14.5	0.212	0.48	0.19	1.8	121	10	304.9	3	0	0	66	1014	7
5	4	24	114	10	91.4	0.271	1.438	0.008	1177	325	-19.7	0.212	0.48	0.18	2.1	121	10	305.2	3	0	0	54	1014	8
5	4	24	114	11	74.1	0.229	1.36	0.008	1228	252	-14.6	0.212	0.48	0.18	1.7	121	10	305.8	3	0	0	52	1013	9
5	4	24	114	12	84.9	0.241	1.441	0.007	1274	273	-15	0.212	0.48	0.18	1.8	120	10	306.2	3	0	0	56	1012	9
5	4	24	114	13	57.8	0.233	1.279	0.007	1304	258	-19.6	0.212	0.48	0.18	1.8	113	10	305.9	3	0	0	56	1011	10
5	4	24	114	14	92.2	0.281	1.504	0.007	1332	342	-21.7	0.212	0.48	0.18	2.2	114	10	306	3	0	0	52	1010	9
5	4	24	114	15	81.3	0.315	1.45	0.006	1354	408	-34.8	0.212	0.48	0.18	2.6	115	10	305.5	3	0	0	50	1010	9
5	4	24	114	16	49.1	0.276	1.23	0.006	1366	334	-38.7	0.212	0.48	0.19	2.3	117	10	304.9	3	0	0	50	1010	9
5	4	24	114	17	16.7	0.268	0.86	0.006	1370	319	-103.6	0.212	0.48	0.23	2.4	121	10	303.5	3	0	0	56	1010	10
5	4	24	114	18	0.1	0.177	0.156	0.006	1368	174	-4983.9	0.212	0.48	0.38	1.7	118	10	301.8	3	0	0	63	1011	3
5	4	24	114	19	-3.8	0.067	-9	-9	-999	48	7.3	0.212	0.48	1	1.3	112	10	300.6	3	0	0	74	1012	3
5	4	24	114	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	111	10	299.9	3	0	0	79	1012	0
5	4	24	114	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	112	10	299.6	3	0	0	82	1013	3
5	4	24	114	22	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	120	10	299.8	3	0	0	88	1013	3
5	4	24	114	23	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	115	10	299.5	3	0	0	91	1013	0
5	4	24	114	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	299.2	3	0	0	88	1013	3
5	4	25	115	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	298.6	3	0	0	88	1012	3
5	4	25	115	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	56	10	297.9	3	0	0	91	1012	3
5	4	25	115	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	58	10	297.8	3	0	0	88	1012	3
5	4	25	115	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	63	10	297.8	3	0	0	88	1012	3
5	4	25	115	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	75	10	297.8	3	0	0	91	1013	7
5	4	25	115	6	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	73	10	298.1	3	0	0	88	1013	3
5	4	25	115	7	-0.7	0.106	-9	-9	-999	79	162.1	0.212	0.48	0.43	1.1	126	10	300.4	3	0	0	94	1014	0
5	4	25	115	8	58	0.27	1.05	0.005	722	323	-30.8	0.212	0.48	0.24	2.2	134	10	302.9	3	0	0	80	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	25	115	9	102.8	0.274	1.358	0.005	883	330	-18.1	0.212	0.48	0.19	2.1	127	10	304.5	3	0	0	70	1014	5
5	4	25	115	10	125.9	0.28	1.514	0.005	999	340	-15.7	0.212	0.48	0.18	2.1	122	10	305.9	3	0	0	56	1014	7
5	4	25	115	11	132.8	0.262	1.603	0.005	1122	309	-12.3	0.212	0.48	0.18	1.9	129	10	306.9	3	0	0	46	1014	7
5	4	25	115	12	124.2	0.25	1.62	0.005	1237	288	-11.4	0.212	0.48	0.18	1.8	124	10	307.4	3	0	0	45	1013	8
5	4	25	115	13	110.9	0.238	1.602	0.005	1340	267	-11	0.212	0.48	0.18	1.7	106	10	307.4	3	0	0	44	1012	9
5	4	25	115	14	91.3	0.253	1.533	0.005	1424	292	-15.9	0.212	0.48	0.18	1.9	114	10	307.1	3	0	0	43	1011	9
5	4	25	115	15	21.6	0.11	0.953	0.005	1440	98	-5.5	0.212	0.48	0.18	0.7	137	10	305.2	3	0	0	47	1010	10
5	4	25	115	16	12.2	0.216	0.789	0.005	1449	231	-74.7	0.212	0.48	0.19	1.9	120	10	304.5	3	0	0	51	1011	10
5	4	25	115	17	5.5	0.199	0.604	0.005	1451	204	-128.9	0.212	0.48	0.23	1.8	110	10	303.5	3	0	0	56	1011	10
5	4	25	115	18	0.1	0.197	0.159	0.005	1448	202	-6950.6	0.212	0.48	0.38	1.9	110	10	302.1	3	0	0	63	1012	3
5	4	25	115	19	-4.4	0.073	-9	-9	-999	57	7.8	0.212	0.48	1	1.4	105	10	301	3	0	0	74	1013	3
5	4	25	115	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	105	10	300.2	3	0	0	82	1013	0
5	4	25	115	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	86	10	299.6	3	0	0	82	1014	3
5	4	25	115	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	97	10	299.1	3	0	0	82	1014	3
5	4	25	115	23	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	96	10	298.9	3	0	0	88	1014	3
5	4	25	115	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	67	10	298.4	3	0	0	88	1013	3
5	4	26	116	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	62	10	297.9	3	0	0	88	1013	3
5	4	26	116	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	50	10	297.4	3	0	0	88	1013	3
5	4	26	116	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	57	10	297	3	0	0	82	1012	3
5	4	26	116	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	92	10	297.4	3	0	0	82	1013	3
5	4	26	116	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	95	10	297.5	3	0	0	90	1013	3
5	4	26	116	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	299	3	0	0	94	1014	3
5	4	26	116	7	22.9	0.13	-9	-9	-999	108	-8.8	0.212	0.48	0.42	0.9	95	10	301.9	3	0	0	82	1014	0
5	4	26	116	8	67.5	0.217	-9	-9	-999	233	-13.7	0.212	0.48	0.24	1.6	104	10	303.4	3	0	0	70	1015	0
5	4	26	116	9	108.3	0.228	-9	-9	-999	250	-9.9	0.212	0.48	0.19	1.6	105	10	304.8	3	0	0	61	1015	0
5	4	26	116	10	106.2	0.247	-9	-9	-999	282	-12.8	0.212	0.48	0.18	1.8	107	10	305.1	3	0	0	59	1014	8
5	4	26	116	11	116.1	0.229	-9	-9	-999	253	-9.4	0.212	0.48	0.18	1.6	97	10	306.4	3	0	0	50	1014	8
5	4	26	116	12	105.9	0.247	-9	-9	-999	282	-12.8	0.212	0.48	0.18	1.8	92	10	306.4	3	0	0	47	1013	9
5	4	26	116	13	131.3	0.262	-9	-9	-999	308	-12.3	0.212	0.48	0.18	1.9	102	10	306.6	3	0	0	44	1012	8
5	4	26	116	14	132.9	0.262	-9	-9	-999	309	-12.2	0.212	0.48	0.18	1.9	100	10	307	3	0	0	46	1012	7
5	4	26	116	15	107.2	0.266	-9	-9	-999	316	-15.8	0.212	0.48	0.18	2	110	10	306.8	3	0	0	41	1011	8
5	4	26	116	16	58.5	0.242	-9	-9	-999	274	-21.9	0.212	0.48	0.19	1.9	109	10	305.9	3	0	0	47	1011	9
5	4	26	116	17	20	0.214	-9	-9	-999	227	-44	0.212	0.48	0.23	1.8	105	10	304.4	3	0	0	50	1012	10
5	4	26	116	18	0.1	0.187	-9	-9	-999	186	-5916.4	0.212	0.48	0.38	1.8	86	10	302.1	3	0	0	59	1012	3
5	4	26	116	19	-6.5	0.088	-9	-9	-999	64	9.5	0.212	0.48	1	1.7	87	10	300.8	3	0	0	72	1013	3
5	4	26	116	20	-9.2	0.111	-9	-9	-999	85	13.5	0.562	0.7	1	1.6	82	10	299.8	3	0	0	74	1013	0
5	4	26	116	21	-5.1	0.078	-9	-9	-999	50	8.4	0.212	0.48	1	1.5	88	10	299	3	0	0	74	1014	3
5	4	26	116	22	-5.9	0.09	-9	-9	-999	62	11.2	0.562	0.7	1	1.3	84	10	298.6	3	0	0	69	1014	3
5	4	26	116	23	-5.2	0.083	-9	-9	-999	55	10.1	0.562	0.7	1	1.2	81	10	298.4	3	0	0	82	1014	0
5	4	26	116	24	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	81	10	298.1	3	0	0	85	1014	3
5	4	27	117	1	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	81	10	297.6	3	0	0	85	1013	3
5	4	27	117	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	57	10	297	3	0	0	90	1013	0
5	4	27	117	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	91	10	296.8	3	0	0	90	1013	3
5	4	27	117	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	96	10	296.8	3	0	0	84	1013	3
5	4	27	117	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	104	10	296.4	3	0	0	82	1013	0
5	4	27	117	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	114	10	298	3	0	0	93	1014	3
5	4	27	117	7	23.7	0.151	-9	-9	-999	134	-13	0.212	0.48	0.42	1.1	90	10	301	3	0	0	79	1015	0
5	4	27	117	8	98.2	0.251	-9	-9	-999	289	-14.5	0.562	0.7	0.23	1.3	76	10	303.4	3	0	0	65	1015	0
5	4	27	117	9	108.6	0.198	-9	-9	-999	204	-6.5	0.212	0.48	0.19	1.3	107	10	304.8	3	0	0	55	1015	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	27	117	10	138.1	0.15	-9	-9	-999	134	-2.2	0.212	0.48	0.18	0.8	108	10	306.5	3	0	0	52	1014	6
5	4	27	117	11	131.4	0.31	-9	-9	-999	397	-20.5	0.562	0.7	0.18	1.7	338	10	304.5	3	0	0	47	1014	9
5	4	27	117	12	94.8	0.349	-9	-9	-999	475	-40.6	0.562	0.7	0.18	2.1	340	10	303.6	3	0	0	44	1013	9
5	4	27	117	13	144.6	0.351	-9	-9	-999	478	-27	0.562	0.7	0.18	2	339	10	304.4	3	0	0	44	1012	8
5	4	27	117	14	58.9	0.15	-9	-9	-999	170	-5.2	0.24	0.3	0.16	0.9	301	10	305.2	3	0	0	43	1011	9
5	4	27	117	15	38.1	0.142	-9	-9	-999	123	-6.8	0.24	0.3	0.16	0.9	263	10	304.6	3	0	0	47	1011	10
5	4	27	117	16	27	0.105	-9	-9	-999	79	-3.9	0.24	0.3	0.17	0.6	290	10	304.6	3	0	0	50	1011	10
5	4	27	117	17	0.1	0.072	-9	-9	-999	44	-335.8	0.562	0.7	0.23	0.5	52	10	302.2	3	0	0	59	1011	10
5	4	27	117	18	0.1	0.125	-9	-9	-999	102	-1772.9	0.212	0.48	0.38	1.2	108	10	301.2	3	0	0	67	1012	3
5	4	27	117	19	-3.3	0.062	-9	-9	-999	37	6.7	0.212	0.48	1	1.2	99	10	300.4	3	0	0	72	1013	3
5	4	27	117	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	83	10	299.5	3	0	0	72	1013	3
5	4	27	117	21	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	84	10	298.9	3	0	0	74	1014	3
5	4	27	117	22	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	88	10	298.4	3	0	0	74	1014	3
5	4	27	117	23	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	82	10	297.9	3	0	0	79	1014	3
5	4	27	117	24	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	84	10	297.5	3	0	0	85	1013	3
5	4	28	118	1	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	82	10	297.2	3	0	0	85	1013	3
5	4	28	118	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	78	10	296.9	3	0	0	82	1012	0
5	4	28	118	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	48	10	296.8	3	0	0	84	1012	3
5	4	28	118	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	297	3	0	0	84	1013	3
5	4	28	118	5	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	86	10	297.4	3	0	0	76	1013	7
5	4	28	118	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	299	3	0	0	90	1013	7
5	4	28	118	7	29.3	0.197	-9	-9	-999	201	-23.5	0.562	0.7	0.42	1.1	66	10	301.4	3	0	0	79	1014	0
5	4	28	118	8	89.4	0.248	-9	-9	-999	284	-15.5	0.562	0.7	0.23	1.3	83	10	303.4	3	0	0	61	1014	0
5	4	28	118	9	118.8	0.211	-9	-9	-999	223	-7.1	0.212	0.48	0.19	1.4	105	10	305	3	0	0	55	1014	0
5	4	28	118	10	162.6	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	306.6	3	0	0	50	1013	5
5	4	28	118	11	96.7	0.191	-9	-9	-999	192	-6.5	0.24	0.3	0.16	1.2	314	10	305.5	3	0	0	47	1013	7
5	4	28	118	12	204.5	0.35	-9	-9	-999	477	-19	0.562	0.7	0.18	1.9	337	10	306.1	3	0	0	42	1012	7
5	4	28	118	13	160.1	0.379	-9	-9	-999	536	-30.6	0.562	0.7	0.18	2.2	336	10	304.9	3	0	0	42	1011	8
5	4	28	118	14	86.9	0.268	-9	-9	-999	325	-20	0.24	0.3	0.16	2	326	10	305	3	0	0	47	1011	8
5	4	28	118	15	70.3	0.316	-9	-9	-999	409	-40.5	0.562	0.7	0.18	1.9	338	10	304.1	3	0	0	50	1010	10
5	4	28	118	16	26	0.231	-9	-9	-999	259	-42.9	0.562	0.7	0.19	1.4	356	10	303.4	3	0	0	47	1010	10
5	4	28	118	17	5.3	0.113	-9	-9	-999	95	-24.6	0.212	0.48	0.23	0.9	96	10	303.2	3	0	0	52	1011	10
5	4	28	118	18	0.1	0.146	-9	-9	-999	128	-2797.4	0.212	0.48	0.38	1.4	108	10	301.9	3	0	0	59	1012	3
5	4	28	118	19	-4.4	0.073	-9	-9	-999	46	7.8	0.212	0.48	1	1.4	110	10	300.9	3	0	0	74	1012	3
5	4	28	118	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	105	10	299.9	3	0	0	77	1013	0
5	4	28	118	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	116	10	299.5	3	0	0	77	1014	3
5	4	28	118	22	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	104	10	299	3	0	0	82	1014	3
5	4	28	118	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	298.8	3	0	0	88	1013	3
5	4	28	118	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	298.1	3	0	0	88	1013	3
5	4	29	119	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	50	10	297.8	3	0	0	88	1012	3
5	4	29	119	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	38	10	297.4	3	0	0	90	1012	0
5	4	29	119	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	36	10	297.1	3	0	0	88	1012	3
5	4	29	119	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	81	10	297.2	3	0	0	94	1012	3
5	4	29	119	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	88	10	297.4	3	0	0	97	1012	3
5	4	29	119	6	-0.8	0.035	-9	-9	-999	15	4.9	0.562	0.7	1	0.5	64	10	299.5	3	0	0	94	1013	7
5	4	29	119	7	22.5	0.11	-9	-9	-999	84	-5.4	0.212	0.48	0.42	0.7	93	10	302.2	3	0	0	88	1013	0
5	4	29	119	8	53.2	0.231	-9	-9	-999	255	-20.9	0.212	0.48	0.23	1.8	134	10	302.9	3	0	0	75	1014	7
5	4	29	119	9	105.9	0.227	-9	-9	-999	249	-10	0.212	0.48	0.19	1.6	125	10	304.9	3	0	0	61	1014	4
5	4	29	119	10	150.3	0.221	-9	-9	-999	239	-6.5	0.687	0.8	0.18	0.9	158	10	306.2	3	0	0	54	1014	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	4	29	119	11	59.5	0.144	-9	-9	-999	128	-4.6	0.562	0.7	0.18	0.6	356	10	304.9	3	0	0	52	1013	10
5	4	29	119	12	70.5	0.254	-9	-9	-999	295	-21	0.562	0.7	0.18	1.4	351	10	304.1	3	0	0	47	1012	10
5	4	29	119	13	62.9	0.276	-9	-9	-999	333	-30.2	0.562	0.7	0.18	1.6	349	10	304	3	0	0	54	1012	10
5	4	29	119	14	55	0.31	-9	-9	-999	397	-48.8	0.562	0.7	0.18	1.9	350	10	303.6	3	0	0	58	1011	10
5	4	29	119	15	71.9	0.342	-9	-9	-999	459	-50.1	0.562	0.7	0.18	2.1	351	10	303.6	3	0	0	61	1011	10
5	4	29	119	16	46.9	0.269	-9	-9	-999	323	-37.3	0.562	0.7	0.19	1.6	359	10	303.9	3	0	0	66	1011	10
5	4	29	119	17	3.2	0.153	-9	-9	-999	143	-100.8	0.562	0.7	0.23	1	55	10	303.2	3	0	0	59	1011	10
5	4	29	119	18	0.1	0.136	-9	-9	-999	115	-2246.3	0.212	0.48	0.38	1.3	108	10	302.5	3	0	0	69	1012	7
5	4	29	119	19	-2.9	0.062	-9	-9	-999	37	7.5	0.212	0.48	1	1.2	105	10	301.2	3	0	0	79	1013	7
5	4	29	119	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	112	10	300.4	3	0	0	79	1014	7
5	4	29	119	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	114	10	299.8	3	0	0	82	1014	7
5	4	29	119	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	94	10	299.4	3	0	0	82	1014	7
5	4	29	119	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	298.9	3	0	0	88	1014	0
5	4	29	119	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	64	10	298.5	3	0	0	88	1014	3
5	4	30	120	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	81	10	298.1	3	0	0	88	1013	3
5	4	30	120	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	298	3	0	0	94	1013	3
5	4	30	120	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	53	10	297.6	3	0	0	88	1013	3
5	4	30	120	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	56	10	297.4	3	0	0	88	1013	3
5	4	30	120	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	79	10	297.5	3	0	0	94	1013	7
5	4	30	120	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	78	10	298.4	3	0	0	94	1013	7
5	4	30	120	7	7.6	0.125	-9	-9	-999	102	-23.5	0.562	0.7	0.41	0.7	60	10	300.6	3	0	0	88	1014	0
5	4	30	120	8	46.2	0.152	-9	-9	-999	136	-6.8	0.212	0.48	0.23	1	108	10	302.5	3	0	0	80	1015	7
5	4	30	120	9	55.7	0.194	-9	-9	-999	196	-11.8	0.212	0.48	0.19	1.4	129	10	303.5	3	0	0	75	1015	9
5	4	30	120	10	79	0.23	-9	-9	-999	254	-14	0.212	0.48	0.18	1.7	98	10	304	3	0	0	70	1015	9
5	4	30	120	11	121.2	0.24	-9	-9	-999	271	-10.3	0.212	0.48	0.18	1.7	90	10	304.6	3	0	0	85	1015	8
5	4	30	120	12	114.6	0.22	-9	-9	-999	237	-8.4	0.212	0.48	0.18	1.5	109	10	306	3	0	0	75	1014	8
5	4	30	120	13	52.9	0.183	-9	-9	-999	181	-10.5	0.212	0.48	0.18	1.3	108	10	304.9	3	0	0	66	1013	10
5	4	30	120	14	19.9	0.109	-9	-9	-999	84	-5.8	0.212	0.48	0.18	0.7	95	10	301.6	3	0	12.45	58	1013	10
5	4	30	120	15	38.1	0.158	-9	-9	-999	144	-9.3	0.212	0.48	0.18	1.1	98	10	302.4	3	0	0	61	1012	10
5	4	30	120	16	18.8	0.156	-9	-9	-999	142	-18.4	0.212	0.48	0.19	1.2	120	10	302.9	3	0	0	56	1012	10
5	4	30	120	17	6.3	0.171	-9	-9	-999	163	-71.5	0.212	0.48	0.23	1.5	109	10	302.4	3	0	0	70	1013	10
5	4	30	120	18	0.1	0.146	-9	-9	-999	128	-2803	0.212	0.48	0.38	1.4	114	10	301.4	3	0	0	70	1014	7
5	4	30	120	19	-1.6	0.047	-9	-9	-999	31	5.6	0.212	0.48	1	0.9	117	10	300.5	3	0	0	79	1015	7
5	4	30	120	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	89	10	300.1	3	0	0	79	1015	7
5	4	30	120	21	-2.9	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	82	10	299.4	3	0	0	88	1015	3
5	4	30	120	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	299	3	0	0	88	1015	7
5	4	30	120	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	104	10	298.8	3	0	0	94	1015	7
5	4	30	120	24	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	130	10	298.8	3	0	0	94	1014	3
5	5	1	121	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	128	10	298.6	3	0	0	94	1014	7
5	5	1	121	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.2	3	0	0	94	1013	7
5	5	1	121	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	55	10	297.9	3	0	0	88	1013	3
5	5	1	121	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	297.8	3	0	0	88	1013	3
5	5	1	121	5	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	102	10	297.9	3	0	0	94	1014	7
5	5	1	121	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	101	10	298.5	3	0	0	94	1014	7
5	5	1	121	7	7	0.087	-9	-9	-999	59	-8.6	0.212	0.48	0.41	0.6	92	10	300.5	3	0	0	88	1015	0
5	5	1	121	8	47.6	0.098	-9	-9	-999	71	-1.8	0.212	0.48	0.23	0.5	114	10	302.5	3	0	0	77	1016	7
5	5	1	121	9	8.8	0.325	-9	-9	-999	426	-354.7	0.687	0.8	0.19	2.1	159	10	298.2	3	0	4.32	75	1017	10
5	5	1	121	10	19	0.227	-9	-9	-999	252	-55.7	0.687	0.8	0.18	1.3	160	10	297.9	3	0	0.25	82	1017	10
5	5	1	121	11	38.2	0.177	-9	-9	-999	172	-13.2	0.212	0.48	0.18	1.3	132	10	299	3	0	0	79	1016	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	1	121	12	50.7	0.173	-9	-9	-999	165	-9.2	0.212	0.48	0.18	1.2	138	10	300.4	3	0	0	94	1015	10
5	5	1	121	13	65.7	0.254	-9	-9	-999	295	-22.7	0.687	0.8	0.18	1.3	162	10	300.9	3	0	0	94	1015	10
5	5	1	121	14	53.6	0.222	-9	-9	-999	241	-18.5	0.687	0.8	0.18	1.1	158	10	301.2	3	0	0	88	1014	10
5	5	1	121	15	40.7	0.139	-9	-9	-999	121	-6	0.212	0.48	0.18	0.9	133	10	301.6	3	0	0	85	1013	10
5	5	1	121	16	20.9	0.149	-9	-9	-999	132	-14.2	0.212	0.48	0.19	1.1	103	10	301.2	3	0	0	75	1012	10
5	5	1	121	17	4	0.129	-9	-9	-999	107	-49.1	0.212	0.48	0.23	1.1	118	10	300.2	3	0	0	79	1013	10
5	5	1	121	18	0.1	0.084	-9	-9	-999	57	-544.7	0.212	0.48	0.38	0.8	125	10	299.6	3	0	0	82	1013	7
5	5	1	121	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	299	3	0	0	88	1014	7
5	5	1	121	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	298.5	3	0	0	85	1015	7
5	5	1	121	21	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.4	3	0	0	94	1015	7
5	5	1	121	22	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298	3	0	0	94	1015	7
5	5	1	121	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	94	1015	0
5	5	1	121	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.6	3	0	0	94	1014	7
5	5	2	122	1	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	113	10	297.5	3	0	0	94	1014	7
5	5	2	122	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	97	10	297.4	3	0	0	97	1013	7
5	5	2	122	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	84	10	297.2	3	0	0	100	1013	7
5	5	2	122	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	297.1	3	0	0	94	1013	7
5	5	2	122	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	297	3	0	0	97	1014	7
5	5	2	122	6	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	101	10	297.6	3	0	0	94	1014	7
5	5	2	122	7	24.3	0.122	-9	-9	-999	98	-6.7	0.212	0.48	0.41	0.8	101	10	300.6	3	0	0	94	1015	0
5	5	2	122	8	74.5	0.15	-9	-9	-999	133	-4.1	0.212	0.48	0.23	0.9	110	10	303	3	0	0	82	1015	0
5	5	2	122	9	107.8	0.165	-9	-9	-999	154	-3.8	0.674	0.73	0.18	0.6	242	10	303.9	3	0	0	70	1016	8
5	5	2	122	10	90.1	0.222	-9	-9	-999	241	-11	0.562	0.7	0.18	1.1	341	10	302.8	3	0	0	58	1016	9
5	5	2	122	11	115.4	0.268	-9	-9	-999	320	-15.1	0.562	0.7	0.18	1.4	338	10	303.2	3	0	0	58	1015	9
5	5	2	122	12	105.7	0.226	-9	-9	-999	248	-9.9	0.562	0.7	0.18	1.1	29	10	302.9	3	0	0	58	1014	9
5	5	2	122	13	92.7	0.277	-9	-9	-999	336	-20.8	0.687	0.8	0.18	1.4	192	10	301.5	3	0	0	54	1014	10
5	5	2	122	14	73.1	0.202	-9	-9	-999	211	-10.2	0.687	0.8	0.18	0.9	182	10	299.6	3	0	0.76	77	1013	10
5	5	2	122	15	71.9	0.172	-9	-9	-999	165	-6.4	0.687	0.8	0.18	0.7	164	10	301.4	3	0	0	70	1012	10
5	5	2	122	16	42	0.14	-9	-9	-999	120	-5.9	0.212	0.48	0.19	0.9	138	10	302.1	3	0	0	65	1012	10
5	5	2	122	17	11.3	0.155	-9	-9	-999	141	-30	0.562	0.7	0.23	0.9	53	10	301.9	3	0	0	70	1012	10
5	5	2	122	18	0.1	0.112	-9	-9	-999	87	-1278.1	0.562	0.7	0.38	0.8	55	10	299.8	3	0	0	79	1012	7
5	5	2	122	19	-2	0.056	-9	-9	-999	31	7.8	0.562	0.7	1	0.8	84	10	299.2	3	0	0	79	1013	7
5	5	2	122	20	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	87	10	298.9	3	0	0	85	1013	3
5	5	2	122	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	93	10	298.6	3	0	0	88	1014	3
5	5	2	122	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	298.2	3	0	0	88	1014	3
5	5	2	122	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	298.1	3	0	0	94	1014	3
5	5	2	122	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	71	10	297.9	3	0	0	88	1013	3
5	5	3	123	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	85	10	297.6	3	0	0	100	1013	3
5	5	3	123	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	297.6	3	0	0	100	1012	3
5	5	3	123	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	297.4	3	0	0	94	1012	3
5	5	3	123	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	108	10	297.4	3	0	0	94	1013	3
5	5	3	123	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	93	10	297.4	3	0	0	97	1013	0
5	5	3	123	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	102	10	299.2	3	0	0	94	1014	7
5	5	3	123	7	24.9	0.122	-9	-9	-999	98	-6.6	0.212	0.48	0.41	0.8	100	10	301.8	3	0	0	94	1014	0
5	5	3	123	8	72	0.18	-9	-9	-999	175	-7.3	0.212	0.48	0.23	1.2	106	10	303.4	3	0	0	80	1015	0
5	5	3	123	9	124.8	0.181	-9	-9	-999	177	-4.3	0.212	0.48	0.19	1.1	114	10	305.2	3	0	0	70	1015	0
5	5	3	123	10	154.2	0.21	-9	-9	-999	221	-5.4	0.562	0.7	0.18	0.9	352	10	305.6	3	0	0	60	1015	7
5	5	3	123	11	85.7	0.259	-9	-9	-999	304	-18.4	0.562	0.7	0.18	1.4	334	10	304.2	3	0	0	52	1015	10
5	5	3	123	12	57.2	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	303.2	3	0	7.62	52	1014	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	3	123	13	17.4	0.14	-9	-9	-999	121	-14.4	0.24	0.3	0.16	1	321	10	300.5	3	0	9.65	51	1013	10
5	5	3	123	14	34.2	0.12	-9	-9	-999	95	-4.5	0.24	0.3	0.16	0.7	274	10	302.4	3	0	0	49	1013	10
5	5	3	123	15	71.8	0.133	-9	-9	-999	111	-2.9	0.562	0.7	0.18	0.5	348	10	303.4	3	0	0	51	1012	10
5	5	3	123	16	40.5	0.178	-9	-9	-999	173	-12.6	0.562	0.7	0.19	0.9	359	10	302.5	3	0	0	56	1012	10
5	5	3	123	17	10.6	0.13	-9	-9	-999	108	-18.7	0.212	0.48	0.23	1	110	10	302.5	3	0	0	63	1012	10
5	5	3	123	18	0.1	0.136	-9	-9	-999	115	-2247.8	0.212	0.48	0.38	1.3	114	10	301.1	3	0	0	75	1013	3
5	5	3	123	19	-1.1	0.036	-9	-9	-999	26	3.9	0.212	0.48	1	0.7	101	10	300	3	0	0	79	1013	3
5	5	3	123	20	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	299.5	3	0	0	82	1014	0
5	5	3	123	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	78	10	299.1	3	0	0	82	1015	3
5	5	3	123	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	298.6	3	0	0	82	1015	3
5	5	3	123	23	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	95	10	298.4	3	0	0	88	1014	0
5	5	3	123	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	298.2	3	0	0	88	1014	3
5	5	4	124	1	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	104	10	298.1	3	0	0	94	1013	3
5	5	4	124	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	114	10	297.8	3	0	0	91	1013	0
5	5	4	124	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	99	10	297.6	3	0	0	88	1013	3
5	5	4	124	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	38	10	297.5	3	0	0	94	1013	3
5	5	4	124	5	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	53	10	297.4	3	0	0	88	1014	3
5	5	4	124	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	65	10	297.5	3	0	0	88	1014	3
5	5	4	124	7	7.9	0.155	-9	-9	-999	140	-42.3	0.212	0.48	0.41	1.3	90	10	299.6	3	0	0	82	1015	0
5	5	4	124	8	36.9	0.214	-9	-9	-999	228	-24.1	0.212	0.48	0.23	1.7	94	10	299.9	3	0	0	91	1015	8
5	5	4	124	9	128.6	0.335	-9	-9	-999	445	-26.3	0.562	0.7	0.19	1.9	79	10	300.8	3	0	0	82	1015	6
5	5	4	124	10	145.1	0.321	-9	-9	-999	418	-20.6	0.212	0.48	0.18	2.5	96	10	303.8	3	0	0	58	1015	0
5	5	4	124	11	161.7	0.306	-9	-9	-999	389	-16	0.212	0.48	0.18	2.3	96	10	305.4	3	0	0	56	1015	6
5	5	4	124	12	105.9	0.322	-9	-9	-999	420	-28.5	0.212	0.48	0.18	2.6	104	10	303.6	3	0	0	58	1014	9
5	5	4	124	13	129.9	0.262	-9	-9	-999	309	-12.5	0.212	0.48	0.18	1.9	122	10	303.9	3	0	0	56	1014	8
5	5	4	124	14	65.6	0.217	-9	-9	-999	232	-14	0.212	0.48	0.18	1.6	109	10	303.4	3	0	0	56	1013	10
5	5	4	124	15	43.9	0.218	-9	-9	-999	233	-21.2	0.212	0.48	0.18	1.7	110	10	302.1	3	0	0.25	58	1013	10
5	5	4	124	16	35.6	0.214	-9	-9	-999	227	-24.7	0.212	0.48	0.19	1.7	112	10	301.1	3	0	0	70	1012	10
5	5	4	124	17	6	0.143	-9	-9	-999	125	-43.4	0.212	0.48	0.23	1.2	110	10	301.8	3	0	0	65	1012	10
5	5	4	124	18	0.1	0.166	-9	-9	-999	156	-4167	0.212	0.48	0.38	1.6	96	10	300.4	3	0	0	67	1013	7
5	5	4	124	19	-2.4	0.057	-9	-9	-999	40	6.9	0.212	0.48	1	1.1	88	10	299.4	3	0	0	74	1013	7
5	5	4	124	20	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	97	10	299.2	3	0	0	79	1014	7
5	5	4	124	21	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	89	10	299	3	0	0	85	1014	0
5	5	4	124	22	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	71	10	298.9	3	0	0	91	1015	0
5	5	4	124	23	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	89	10	298.5	3	0	0	97	1015	7
5	5	4	124	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.4	3	0	0	94	1014	7
5	5	5	125	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	297.9	3	0	0	94	1013	7
5	5	5	125	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	297.6	3	0	0	97	1013	7
5	5	5	125	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	74	10	297.5	3	0	0	100	1013	3
5	5	5	125	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	59	10	297.4	3	0	0	94	1013	3
5	5	5	125	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	49	10	297	3	0	0	97	1014	7
5	5	5	125	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	85	10	299.1	3	0	0	94	1014	7
5	5	5	125	7	33.3	0.161	-9	-9	-999	148	-11.3	0.562	0.7	0.41	0.8	66	10	301.8	3	0	0	94	1015	0
5	5	5	125	8	72	0.19	-9	-9	-999	190	-8.6	0.212	0.48	0.23	1.3	108	10	303.4	3	0	0	80	1016	0
5	5	5	125	9	106.8	0.227	-9	-9	-999	249	-10	0.212	0.48	0.19	1.6	113	10	304.6	3	0	0	75	1016	0
5	5	5	125	10	134.9	0.193	-9	-9	-999	196	-4.8	0.212	0.48	0.18	1.2	92	10	306.1	3	0	0	58	1015	6
5	5	5	125	11	98.7	0.266	-9	-9	-999	316	-17.3	0.687	0.8	0.18	1.3	144	10	304.8	3	0	0	52	1015	9
5	5	5	125	12	143.8	0.293	-9	-9	-999	364	-15.8	0.212	0.48	0.18	2.2	132	10	305	3	0	1.02	47	1014	7
5	5	5	125	13	77.1	0.128	-9	-9	-999	126	-2.5	0.212	0.48	0.18	0.7	115	10	302.8	3	0	1.52	58	1014	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	5	125	14	98.9	0.176	-9	-9	-999	170	-5	0.212	0.48	0.18	1.1	137	10	304.6	3	0	0	66	1013	9
5	5	5	125	15	9.2	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	301.5	3	0	0	66	1013	10
5	5	5	125	16	3.4	0.11	-9	-9	-999	84	-35.5	0.687	0.8	0.19	0.6	170	10	299.4	3	0	0.51	70	1013	10
5	5	5	125	17	11.1	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.22	0	0	10	299.9	3	0	0	72	1013	10
5	5	5	125	18	0.1	0.085	-9	-9	-999	57	-558.8	0.562	0.7	0.38	0.6	72	10	299.6	3	0	0	77	1013	10
5	5	5	125	19	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	78	10	298.8	3	0	0	77	1013	3
5	5	5	125	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	88	10	298.4	3	0	0	82	1014	3
5	5	5	125	21	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	91	10	298.1	3	0	0	82	1015	3
5	5	5	125	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	297.9	3	0	0	88	1015	3
5	5	5	125	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	99	10	298	3	0	0	88	1015	3
5	5	5	125	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	88	1014	3
5	5	6	126	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	73	10	297.6	3	0	0	88	1014	3
5	5	6	126	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	297.5	3	0	0	94	1013	7
5	5	6	126	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	107	10	297.4	3	0	0	94	1012	3
5	5	6	126	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	98	10	297.6	3	0	0	100	1013	3
5	5	6	126	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	66	10	297.6	3	0	0	97	1013	7
5	5	6	126	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	71	10	298	3	0	0	95	1014	7
5	5	6	126	7	13	0.195	-9	-9	-999	198	-51.4	0.562	0.7	0.4	1.2	79	10	299.5	3	0	0	94	1014	0
5	5	6	126	8	76.1	0.281	-9	-9	-999	343	-26.5	0.562	0.7	0.23	1.6	84	10	301.1	3	0	0	97	1015	0
5	5	6	126	9	101.4	0.246	-9	-9	-999	280	-13.2	0.212	0.48	0.19	1.8	109	10	301.4	3	0	0	88	1016	5
5	5	6	126	10	94.3	0.234	-9	-9	-999	261	-12.4	0.212	0.48	0.18	1.7	112	10	301.9	3	0	0	94	1015	8
5	5	6	126	11	114.7	0.239	-9	-9	-999	268	-10.7	0.212	0.48	0.18	1.7	117	10	303.5	3	0	0	85	1015	8
5	5	6	126	12	106.5	0.198	-9	-9	-999	203	-6.6	0.212	0.48	0.18	1.3	92	10	304.8	3	0	0	80	1014	9
5	5	6	126	13	76.9	0.181	-9	-9	-999	177	-7	0.212	0.48	0.18	1.2	119	10	305.2	3	0	0	73	1013	9
5	5	6	126	14	12.4	0.16	-9	-9	-999	148	-30	0.212	0.48	0.18	1.3	91	10	301.4	3	0	5.84	66	1012	10
5	5	6	126	15	5.5	0.199	-9	-9	-999	204	-128.9	0.212	0.48	0.18	1.8	102	10	299.4	3	0	0	88	1012	10
5	5	6	126	16	16.1	0.173	-9	-9	-999	166	-29.3	0.562	0.7	0.19	1	75	10	299	3	0	0	82	1011	10
5	5	6	126	17	8.2	0.176	-9	-9	-999	169	-59.8	0.562	0.7	0.23	1.1	84	10	299.4	3	0	0	88	1011	10
5	5	6	126	18	0.1	0.095	-9	-9	-999	69	-763.7	0.212	0.48	0.38	0.9	102	10	299	3	0	0	85	1012	7
5	5	6	126	19	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	80	10	298.6	3	0	0	94	1013	7
5	5	6	126	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	77	10	298.5	3	0	0	94	1013	7
5	5	6	126	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	76	10	298.4	3	0	0	88	1014	7
5	5	6	126	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	102	10	298.1	3	0	0	88	1014	3
5	5	6	126	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.4	3	0	0	94	1014	7
5	5	6	126	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	298.1	3	0	0	100	1013	7
5	5	7	127	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	112	10	298	3	0	0	94	1012	7
5	5	7	127	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	63	10	297.9	3	0	0	94	1012	0
5	5	7	127	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.8	3	0	0	100	1012	7
5	5	7	127	4	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	78	10	297.8	3	0	0	94	1012	3
5	5	7	127	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	297.6	3	0	0.25	100	1012	3
5	5	7	127	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	298.5	3	0	0	94	1013	7
5	5	7	127	7	25.3	0.161	-9	-9	-999	149	-14.9	0.212	0.48	0.4	1.2	88	10	301.8	3	0	0	94	1014	0
5	5	7	127	8	59.1	0.224	-9	-9	-999	243	-17.2	0.212	0.48	0.23	1.7	86	10	302.5	3	0	0	85	1015	0
5	5	7	127	9	80.9	0.211	-9	-9	-999	223	-10.6	0.212	0.48	0.19	1.5	106	10	300.9	3	0	0.25	100	1015	8
5	5	7	127	10	167.7	0.368	-9	-9	-999	514	-27	0.562	0.7	0.18	2.1	79	10	303.2	3	0	0	74	1015	6
5	5	7	127	11	158.2	0.286	-9	-9	-999	355	-13.4	0.212	0.48	0.18	2.1	86	10	304.2	3	0	0	74	1014	6
5	5	7	127	12	132	0.272	-9	-9	-999	326	-13.7	0.212	0.48	0.18	2	90	10	305.1	3	0	0	66	1013	8
5	5	7	127	13	84.2	0.269	-9	-9	-999	321	-20.9	0.212	0.48	0.18	2.1	118	10	305	3	0	0	66	1012	9
5	5	7	127	14	151.1	0.351	-9	-9	-999	477	-25.7	0.212	0.48	0.18	2.8	126	10	304.8	3	0	0	62	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	7	127	15	89.8	0.261	-9	-9	-999	311	-17.9	0.212	0.48	0.18	2	111	10	304.8	3	0	0	62	1011	9
5	5	7	127	16	50.2	0.239	-9	-9	-999	269	-24.5	0.212	0.48	0.19	1.9	100	10	304.1	3	0	0	62	1010	9
5	5	7	127	17	14.6	0.218	-9	-9	-999	235	-64.6	0.212	0.48	0.23	1.9	109	10	301.9	3	0	0	85	1011	10
5	5	7	127	18	0.1	0.146	-9	-9	-999	129	-2797.4	0.212	0.48	0.38	1.4	106	10	300.9	3	0	0	85	1012	7
5	5	7	127	19	-2.9	0.062	-9	-9	-999	39	7.5	0.212	0.48	1	1.2	108	10	300.4	3	0	0	85	1012	7
5	5	7	127	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	90	10	299.9	3	0	0	94	1013	7
5	5	7	127	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	81	10	299.6	3	0	0	88	1013	3
5	5	7	127	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	299.1	3	0	0	94	1014	3
5	5	7	127	23	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	114	10	299.4	3	0	0	94	1014	3
5	5	7	127	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	299.2	3	0	0	94	1013	3
5	5	8	128	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	65	10	298.6	3	0	0	94	1012	3
5	5	8	128	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	298.4	3	0	0	94	1012	7
5	5	8	128	3	-3.2	0.067	-9	-9	-999	40	8.6	0.687	0.8	1	0.9	163	10	298.5	3	0	0	94	1012	3
5	5	8	128	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	298.1	3	0	0	94	1012	7
5	5	8	128	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	69	10	297.9	3	0	0	94	1012	7
5	5	8	128	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	91	10	298.9	3	0	0	94	1013	7
5	5	8	128	7	12.9	0.142	-9	-9	-999	123	-20	0.212	0.48	0.4	1.1	98	10	300.4	3	0	0	88	1013	0
5	5	8	128	8	59.3	0.214	-9	-9	-999	228	-15	0.212	0.48	0.23	1.6	133	10	303	3	0	0	82	1014	0
5	5	8	128	9	94	0.253	-9	-9	-999	293	-15.6	0.212	0.48	0.19	1.9	133	10	304	3	0	0	75	1014	7
5	5	8	128	10	149	0.347	-9	-9	-999	470	-25.3	0.687	0.8	0.18	1.8	144	10	304.4	3	0	0	70	1014	8
5	5	8	128	11	72.6	0.228	-9	-9	-999	258	-14.8	0.212	0.48	0.18	1.7	138	10	302.8	3	0	0	91	1013	9
5	5	8	128	12	143.6	0.305	-9	-9	-999	388	-17.9	0.687	0.8	0.18	1.5	154	10	304.5	3	0	0	70	1012	9
5	5	8	128	13	84.3	0.251	-9	-9	-999	290	-16.8	0.212	0.48	0.18	1.9	133	10	305.1	3	0	0	66	1011	9
5	5	8	128	14	101.7	0.293	-9	-9	-999	364	-22.2	0.212	0.48	0.18	2.3	100	10	304.4	3	0	0	70	1010	9
5	5	8	128	15	104.9	0.266	-9	-9	-999	315	-16.1	0.212	0.48	0.18	2	109	10	305.4	3	0	0	58	1010	8
5	5	8	128	16	66.7	0.274	-9	-9	-999	329	-27.6	0.212	0.48	0.19	2.2	116	10	304.8	3	0	0	58	1010	9
5	5	8	128	17	15.1	0.228	-9	-9	-999	252	-71	0.212	0.48	0.23	2	119	10	303.1	3	0	0	63	1010	10
5	5	8	128	18	0.1	0.156	-9	-9	-999	143	-3431.9	0.212	0.48	0.38	1.5	114	10	301.4	3	0	0	75	1011	7
5	5	8	128	19	-2	0.052	-9	-9	-999	36	6.3	0.212	0.48	1	1	112	10	300.4	3	0	0	79	1012	7
5	5	8	128	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	108	10	299.9	3	0	0	85	1012	7
5	5	8	128	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	299.5	3	0	0	88	1013	7
5	5	8	128	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	299.4	3	0	0	94	1013	7
5	5	8	128	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	79	10	299.1	3	0	0	88	1013	0
5	5	8	128	24	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	70	10	298.8	3	0	0	88	1013	7
5	5	9	129	1	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	80	10	298.5	3	0	0	88	1012	7
5	5	9	129	2	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	69	10	298.1	3	0	0	97	1012	7
5	5	9	129	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	298	3	0	0	94	1011	7
5	5	9	129	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	104	10	297.9	3	0	0	94	1011	7
5	5	9	129	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	102	10	298.2	3	0	0	97	1012	7
5	5	9	129	6	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	118	10	299.5	3	0	0	94	1012	7
5	5	9	129	7	4.5	0.159	-9	-9	-999	145	-79.8	0.212	0.48	0.4	1.4	113	10	301.1	3	0	0	94	1013	0
5	5	9	129	8	79.1	0.277	-9	-9	-999	336	-24.3	0.212	0.48	0.23	2.2	127	10	303.5	3	0	0	82	1013	0
5	5	9	129	9	59.2	0.358	-9	-9	-999	492	-69.9	0.687	0.8	0.19	2.1	141	10	302.1	3	0	0	85	1014	9
5	5	9	129	10	94.6	0.291	-9	-9	-999	363	-23.5	0.212	0.48	0.18	2.3	129	10	302.8	3	0	2.54	70	1014	8
5	5	9	129	11	152.1	0.374	-9	-9	-999	526	-31.1	0.687	0.8	0.18	2	141	10	302.2	3	0	2.79	88	1013	8
5	5	9	129	12	149.4	0.413	-9	-9	-999	610	-42.5	0.687	0.8	0.18	2.3	140	10	304	3	0	0	70	1013	9
5	5	9	129	13	110.5	0.363	-9	-9	-999	504	-39	0.687	0.8	0.18	2	151	10	303.9	3	0	0	70	1012	9
5	5	9	129	14	54	0.231	-9	-9	-999	265	-20.6	0.212	0.48	0.18	1.8	128	10	304.2	3	0	0	63	1011	10
5	5	9	129	15	49.5	0.239	-9	-9	-999	268	-24.8	0.212	0.48	0.18	1.9	124	10	304.4	3	0	0	55	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	9	129	16	26.3	0.227	-9	-9	-999	249	-40.2	0.212	0.48	0.19	1.9	123	10	303.4	3	0	0	59	1010	10
5	5	9	129	17	6.2	0.209	-9	-9	-999	220	-134	0.212	0.48	0.23	1.9	117	10	302	3	0	0	67	1010	10
5	5	9	129	18	0.1	0.125	-9	-9	-999	104	-1771.1	0.212	0.48	0.38	1.2	116	10	300.9	3	0	0	74	1011	7
5	5	9	129	19	-2	0.052	-9	-9	-999	29	6.3	0.212	0.48	1	1	113	10	300	3	0	0	74	1012	7
5	5	9	129	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	82	10	299.4	3	0	0	82	1012	7
5	5	9	129	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.9	3	0	0	88	1012	7
5	5	9	129	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	64	10	298.1	3	0	0	82	1013	7
5	5	9	129	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	62	10	297.9	3	0	0	85	1013	0
5	5	9	129	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	29	10	297.5	3	0	0	88	1013	7
5	5	10	130	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	297.1	3	0	0	88	1012	7
5	5	10	130	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	297	3	0	0	88	1012	7
5	5	10	130	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	297	3	0	0	88	1012	3
5	5	10	130	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	92	10	297	3	0	0	94	1012	3
5	5	10	130	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	113	10	297.4	3	0	0	97	1012	0
5	5	10	130	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.4	3	0	0	94	1012	7
5	5	10	130	7	20.2	0.186	-9	-9	-999	184	-28.7	0.212	0.48	0.4	1.5	130	10	301.9	3	0	0	88	1013	0
5	5	10	130	8	60.1	0.262	-9	-9	-999	308	-27	0.212	0.48	0.23	2.1	137	10	302.9	3	0	0	88	1013	5
5	5	10	130	9	102.8	0.293	-9	-9	-999	365	-22.1	0.212	0.48	0.19	2.3	138	10	304.4	3	0	0	75	1013	5
5	5	10	130	10	134.4	0.328	-9	-9	-999	433	-23.8	0.212	0.48	0.18	2.6	138	10	305.2	3	0	0	70	1013	6
5	5	10	130	11	160.6	0.442	-9	-9	-999	677	-48.7	0.687	0.8	0.18	2.5	150	10	305.8	3	0	0	68	1013	8
5	5	10	130	12	191.8	0.449	-9	-9	-999	691	-42.5	0.687	0.8	0.18	2.5	146	10	306.4	3	0	0	62	1012	8
5	5	10	130	13	189.6	0.462	-9	-9	-999	721	-46.8	0.687	0.8	0.18	2.6	143	10	306.1	3	0	0	62	1012	8
5	5	10	130	14	87.4	0.308	-9	-9	-999	408	-30.1	0.212	0.48	0.18	2.5	136	10	305.4	3	0	0	58	1010	9
5	5	10	130	15	79.7	0.296	-9	-9	-999	371	-29.4	0.212	0.48	0.18	2.4	134	10	305.4	3	0	0	58	1010	9
5	5	10	130	16	44.3	0.265	-9	-9	-999	314	-37.8	0.212	0.48	0.19	2.2	126	10	304.1	3	0	0	58	1010	9
5	5	10	130	17	9.3	0.271	-9	-9	-999	324	-193.6	0.212	0.48	0.23	2.5	126	10	302.6	3	0	0	63	1010	10
5	5	10	130	18	0.1	0.166	-9	-9	-999	160	-4155.9	0.212	0.48	0.38	1.6	120	10	301.4	3	0	0	70	1010	7
5	5	10	130	19	-2.9	0.062	-9	-9	-999	43	7.5	0.212	0.48	1	1.2	114	10	300.4	3	0	0	79	1011	7
5	5	10	130	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	99	10	299.9	3	0	0	82	1012	7
5	5	10	130	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	113	10	299.6	3	0	0	82	1012	7
5	5	10	130	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	105	10	299.4	3	0	0	88	1012	7
5	5	10	130	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	299.1	3	0	0	88	1012	7
5	5	10	130	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	298.5	3	0	0	88	1012	7
5	5	11	131	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	108	10	298.4	3	0	0	88	1011	7
5	5	11	131	2	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	89	10	298	3	0	0	88	1011	7
5	5	11	131	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	79	10	297.8	3	0	0	88	1011	7
5	5	11	131	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	56	10	297.1	3	0	0	94	1011	7
5	5	11	131	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	297.4	3	0	0	94	1012	7
5	5	11	131	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	104	10	299.1	3	0	0	88	1012	7
5	5	11	131	7	24.6	0.217	-9	-9	-999	232	-37.4	0.212	0.48	0.4	1.8	121	10	301.9	3	0	0	82	1013	0
5	5	11	131	8	76.3	0.286	-9	-9	-999	352	-27.7	0.212	0.48	0.23	2.3	126	10	303.4	3	0	0	75	1013	0
5	5	11	131	9	118.6	0.316	-9	-9	-999	408	-23.9	0.212	0.48	0.19	2.5	123	10	304.6	3	0	0	65	1013	0
5	5	11	131	10	124.1	0.317	-9	-9	-999	410	-23.1	0.212	0.48	0.18	2.5	136	10	305.4	3	0	0	56	1013	7
5	5	11	131	11	157.8	0.296	-9	-9	-999	370	-14.8	0.212	0.48	0.18	2.2	126	10	306.4	3	0	0	55	1012	6
5	5	11	131	12	132.6	0.3	-9	-9	-999	377	-18.3	0.212	0.48	0.18	2.3	128	10	306.2	3	0	0	50	1012	8
5	5	11	131	13	141.7	0.292	-9	-9	-999	364	-15.9	0.212	0.48	0.18	2.2	125	10	306.5	3	0	0	52	1011	7
5	5	11	131	14	113.2	0.296	-9	-9	-999	369	-20.5	0.212	0.48	0.18	2.3	126	10	306.4	3	0	0	54	1010	8
5	5	11	131	15	81.3	0.278	-9	-9	-999	337	-23.8	0.212	0.48	0.18	2.2	129	10	305.6	3	0	0	54	1009	9
5	5	11	131	16	50.4	0.267	-9	-9	-999	318	-34.2	0.212	0.48	0.19	2.2	118	10	304.5	3	0	0	61	1009	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	11	131	17	25.2	0.227	-9	-9	-999	249	-41.5	0.212	0.48	0.23	1.9	108	10	303.8	3	0	0	68	1009	10
5	5	11	131	18	0.1	0.177	-9	-9	-999	171	-4977.2	0.212	0.48	0.38	1.7	108	10	301.9	3	0	0	75	1010	7
5	5	11	131	19	-2	0.052	-9	-9	-999	44	6.3	0.212	0.48	1	1	111	10	300.6	3	0	0	79	1010	7
5	5	11	131	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	101	10	300	3	0	0	94	1011	0
5	5	11	131	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	99	10	299.6	3	0	0	88	1012	3
5	5	11	131	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	91	10	299.1	3	0	0	82	1012	3
5	5	11	131	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	105	10	298.9	3	0	0	91	1012	0
5	5	11	131	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	100	10	298.5	3	0	0	88	1012	3
5	5	12	132	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	297.9	3	0	0	82	1011	3
5	5	12	132	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	95	10	297.6	3	0	0	85	1010	0
5	5	12	132	3	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	92	10	297.5	3	0	0	88	1011	0
5	5	12	132	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	297.4	3	0	0	94	1011	3
5	5	12	132	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	81	10	297.1	3	0	0	94	1011	0
5	5	12	132	6	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	95	10	298.9	3	0	0	94	1011	3
5	5	12	132	7	9.1	0.128	-9	-9	-999	106	-21	0.212	0.48	0.4	1	92	10	301.2	3	0	0	82	1012	0
5	5	12	132	8	54.5	0.213	-9	-9	-999	226	-15.9	0.212	0.48	0.23	1.6	99	10	302.4	3	0	0	77	1012	6
5	5	12	132	9	76.4	0.22	-9	-9	-999	237	-12.6	0.212	0.48	0.19	1.6	93	10	303.9	3	0	0	85	1012	8
5	5	12	132	10	88	0.233	-9	-9	-999	258	-12.9	0.212	0.48	0.18	1.7	103	10	304.2	3	0	0	75	1012	9
5	5	12	132	11	154.7	0.256	-9	-9	-999	298	-9.8	0.212	0.48	0.18	1.8	113	10	306.1	3	0	0	66	1012	6
5	5	12	132	12	116	0.268	-9	-9	-999	319	-15	0.212	0.48	0.18	2	109	10	305.9	3	0	0	75	1011	8
5	5	12	132	13	126.7	0.289	-9	-9	-999	357	-17.2	0.212	0.48	0.18	2.2	115	10	306.4	3	0	0	62	1010	8
5	5	12	132	14	101.1	0.283	-9	-9	-999	347	-20.2	0.212	0.48	0.18	2.2	117	10	305.9	3	0	0	64	1010	9
5	5	12	132	15	45.4	0.284	-9	-9	-999	348	-45.3	0.212	0.48	0.18	2.4	120	10	302	3	0	0.25	75	1010	10
5	5	12	132	16	47.6	0.201	-9	-9	-999	209	-15.3	0.212	0.48	0.19	1.5	95	10	301.8	3	0	0	94	1009	9
5	5	12	132	17	10	0.204	-9	-9	-999	213	-77	0.212	0.48	0.23	1.8	108	10	301.1	3	0	0	88	1009	10
5	5	12	132	18	0.1	0.125	-9	-9	-999	104	-1769.4	0.212	0.48	0.38	1.2	118	10	299.9	3	0	0	94	1010	3
5	5	12	132	19	-2.3	0.052	-9	-9	-999	29	5.6	0.212	0.48	1	1	110	10	299.8	3	0	0	94	1010	3
5	5	12	132	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	98	10	299.8	3	0	0	94	1011	7
5	5	12	132	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	112	10	299.4	3	0	0.51	94	1012	3
5	5	12	132	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	102	10	298.9	3	0	0	94	1012	3
5	5	12	132	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.9	3	0	0	97	1012	7
5	5	12	132	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.9	3	0	0	94	1011	7
5	5	13	133	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	298.5	3	0	0	94	1010	7
5	5	13	133	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	298.4	3	0	0	97	1010	3
5	5	13	133	3	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	298.6	3	0	0	94	1010	3
5	5	13	133	4	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	99	10	299	3	0	0	94	1010	0
5	5	13	133	5	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	91	10	299.1	3	0	0	94	1010	7
5	5	13	133	6	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	97	10	299.4	3	0	0	94	1010	7
5	5	13	133	7	8.9	0.147	-9	-9	-999	129	-32.1	0.212	0.48	0.4	1.2	107	10	300.4	3	0	0	88	1011	5
5	5	13	133	8	59.8	0.243	-9	-9	-999	275	-21.6	0.212	0.48	0.23	1.9	111	10	302.2	3	0	0	82	1012	5
5	5	13	133	9	101.1	0.312	-9	-9	-999	400	-27	0.212	0.48	0.19	2.5	116	10	303.8	3	0	0	70	1012	6
5	5	13	133	10	138.7	0.348	-9	-9	-999	473	-27.5	0.212	0.48	0.18	2.8	124	10	305.1	3	0	0	70	1011	5
5	5	13	133	11	148.6	0.341	-9	-9	-999	457	-24	0.212	0.48	0.18	2.7	124	10	305.9	3	0	0	61	1011	7
5	5	13	133	12	160.8	0.334	-9	-9	-999	443	-20.8	0.212	0.48	0.18	2.6	117	10	306.2	3	0	0	75	1010	6
5	5	13	133	13	110.1	0.333	-9	-9	-999	441	-30.1	0.212	0.48	0.18	2.7	131	10	305.9	3	0	0	62	1010	9
5	5	13	133	14	105.4	0.313	-9	-9	-999	402	-26	0.212	0.48	0.18	2.5	122	10	305.9	3	0	0	54	1009	8
5	5	13	133	15	90.2	0.261	-9	-9	-999	308	-17.8	0.212	0.48	0.18	2	118	10	305.8	3	0	0	56	1008	8
5	5	13	133	16	56.5	0.251	-9	-9	-999	289	-25.2	0.212	0.48	0.19	2	115	10	304.9	3	0	0	52	1008	9
5	5	13	133	17	13.8	0.218	-9	-9	-999	234	-67.5	0.212	0.48	0.23	1.9	116	10	303.2	3	0	0	61	1008	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	13	133	18	0.1	0.166	-9	-9	-999	157	-4150.4	0.212	0.48	0.38	1.6	103	10	301.5	3	0	0	70	1009	7
5	5	13	133	19	-2	0.052	-9	-9	-999	39	6.3	0.212	0.48	1	1	93	10	300.6	3	0	0	74	1009	7
5	5	13	133	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	300.1	3	0	0	82	1010	7
5	5	13	133	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	79	10	299.9	3	0	0	82	1010	7
5	5	13	133	22	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	77	10	299.9	3	0	0	82	1011	7
5	5	13	133	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	75	10	299.5	3	0	0	91	1011	7
5	5	13	133	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	79	10	299.2	3	0	0	82	1010	7
5	5	14	134	1	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	98	10	298.9	3	0	0	88	1010	7
5	5	14	134	2	-3.2	0.073	-9	-9	-999	45	10.8	0.212	0.48	1	1.4	86	10	298.9	3	0	0	91	1009	10
5	5	14	134	3	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	64	10	298.5	3	0	0	100	1009	7
5	5	14	134	4	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	69	10	298.4	3	0	0.25	100	1010	7
5	5	14	134	5	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	88	10	298.2	3	0	0	94	1009	7
5	5	14	134	6	-2.5	0.069	-9	-9	-999	42	11.9	0.562	0.7	1	1	78	10	298.8	3	0	0	100	1010	10
5	5	14	134	7	8.7	0.14	-9	-9	-999	120	-28.1	0.562	0.7	0.4	0.8	59	10	298.9	3	0	1.52	94	1010	9
5	5	14	134	8	41.6	0.159	-9	-9	-999	146	-8.8	0.212	0.48	0.23	1.1	94	10	300.9	3	0	0	94	1010	8
5	5	14	134	9	55.2	0.194	-9	-9	-999	197	-11.9	0.212	0.48	0.19	1.4	108	10	302.4	3	0	0	85	1011	9
5	5	14	134	10	111.9	0.248	-9	-9	-999	284	-12.3	0.212	0.48	0.18	1.8	102	10	304.6	3	0	0	80	1010	7
5	5	14	134	11	116.9	0.296	-9	-9	-999	371	-20.1	0.212	0.48	0.18	2.3	97	10	304.9	3	0	0	75	1010	8
5	5	14	134	12	105.4	0.284	-9	-9	-999	349	-19.6	0.212	0.48	0.18	2.2	97	10	305.4	3	0	0	70	1009	9
5	5	14	134	13	96	0.301	-9	-9	-999	379	-25.5	0.212	0.48	0.18	2.4	97	10	304.8	3	0	0	66	1009	9
5	5	14	134	14	109.5	0.304	-9	-9	-999	386	-23.1	0.212	0.48	0.18	2.4	99	10	305.1	3	0	0	64	1008	8
5	5	14	134	15	75.1	0.267	-9	-9	-999	317	-22.7	0.212	0.48	0.18	2.1	106	10	305.2	3	0	0	62	1008	9
5	5	14	134	16	51.8	0.259	-9	-9	-999	303	-30	0.212	0.48	0.19	2.1	111	10	304.4	3	0	0	58	1008	9
5	5	14	134	17	6.5	0.239	-9	-9	-999	269	-187.3	0.212	0.48	0.23	2.2	99	10	302.9	3	0	0	70	1008	10
5	5	14	134	18	0.1	0.187	-9	-9	-999	187	-5892.7	0.212	0.48	0.38	1.8	99	10	301.8	3	0	0	75	1008	7
5	5	14	134	19	-4.5	0.078	-9	-9	-999	57	9.4	0.212	0.48	1	1.5	104	10	300.9	3	0	0	85	1009	7
5	5	14	134	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	82	10	299.9	3	0	0	94	1009	7
5	5	14	134	21	-5	0.083	-9	-9	-999	55	10.4	0.562	0.7	1	1.2	72	10	299.9	3	0	0	94	1010	3
5	5	14	134	22	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	87	10	299.5	3	0	0	88	1010	7
5	5	14	134	23	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	72	10	299.4	3	0	0	94	1009	7
5	5	14	134	24	-4.5	0.073	-9	-9	-999	45	7.6	0.212	0.48	1	1.4	104	10	299.1	3	0	0	94	1009	0
5	5	15	135	1	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	126	10	299.5	3	0	0	100	1008	7
5	5	15	135	2	-3.2	0.073	-9	-9	-999	45	10.8	0.212	0.48	1	1.4	128	10	299.8	3	0	0	97	1008	10
5	5	15	135	3	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	138	10	299.4	3	0	0	100	1008	7
5	5	15	135	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	299.1	3	0	0	100	1008	7
5	5	15	135	5	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	83	10	298.9	3	0	0	97	1009	7
5	5	15	135	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	81	10	298.9	3	0	5.84	100	1009	7
5	5	15	135	7	0.1	0.136	-9	-9	-999	115	-2242.6	0.212	0.48	0.4	1.3	105	10	298.6	3	0	2.54	94	1010	10
5	5	15	135	8	14.3	0.162	-9	-9	-999	150	-26.8	0.212	0.48	0.23	1.3	129	10	298.4	3	0	1.52	100	1011	10
5	5	15	135	9	54.1	0.154	-9	-9	-999	139	-6.1	0.212	0.48	0.19	1	102	10	300	3	0	0	94	1011	9
5	5	15	135	10	85.2	0.203	-9	-9	-999	210	-8.8	0.212	0.48	0.18	1.4	105	10	301.4	3	0	0	94	1011	9
5	5	15	135	11	127.8	0.232	-9	-9	-999	257	-8.8	0.212	0.48	0.18	1.6	106	10	302.8	3	0	0	91	1010	8
5	5	15	135	12	104.8	0.266	-9	-9	-999	315	-16.1	0.212	0.48	0.18	2	124	10	304.4	3	0	0	85	1010	9
5	5	15	135	13	127.4	0.271	-9	-9	-999	324	-14	0.212	0.48	0.18	2	126	10	304.9	3	0	0	80	1009	8
5	5	15	135	14	51.9	0.23	-9	-9	-999	255	-21.2	0.212	0.48	0.18	1.8	121	10	302.9	3	0	1.02	77	1009	10
5	5	15	135	15	11.6	0.141	-9	-9	-999	124	-21.5	0.212	0.48	0.18	1.1	107	10	299.9	3	0	0.76	85	1008	10
5	5	15	135	16	35.4	0.176	-9	-9	-999	170	-13.9	0.212	0.48	0.19	1.3	101	10	300.5	3	0	0	94	1008	10
5	5	15	135	17	6.8	0.135	-9	-9	-999	114	-32.1	0.212	0.48	0.23	1.1	95	10	300.4	3	0	0	88	1008	10
5	5	15	135	18	0.1	0.105	-9	-9	-999	78	-1034.3	0.212	0.48	0.38	1	94	10	299.8	3	0	0	94	1008	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	15	135	19	-2	0.052	-9	-9	-999	28	6.3	0.212	0.48	1	1	91	10	299.4	3	0	0	88	1009	7
5	5	15	135	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	299.4	3	0	0	91	1010	7
5	5	15	135	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	102	10	299.4	3	0	0	88	1010	7
5	5	15	135	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	101	10	299.4	3	0	0	88	1010	7
5	5	15	135	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	299.5	3	0	0	88	1010	3
5	5	15	135	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	73	10	299.4	3	0	0	100	1010	3
5	5	16	136	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	90	10	299.1	3	0	0	100	1010	3
5	5	16	136	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	77	10	298.9	3	0	0	97	1010	7
5	5	16	136	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.8	3	0	0	100	1009	3
5	5	16	136	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	88	10	298.6	3	0	0	94	1010	7
5	5	16	136	5	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	95	10	298.5	3	0	0	94	1010	0
5	5	16	136	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	88	10	299	3	0	0	94	1010	7
5	5	16	136	7	8.1	0.126	-9	-9	-999	103	-22.5	0.562	0.7	0.39	0.7	74	10	300	3	0	0	100	1011	2
5	5	16	136	8	59.6	0.176	-9	-9	-999	170	-8.3	0.212	0.48	0.23	1.2	91	10	302	3	0	0	91	1012	4
5	5	16	136	9	30.8	0.164	-9	-9	-999	153	-13	0.212	0.48	0.19	1.2	131	10	300.4	3	0	3.81	92	1012	10
5	5	16	136	10	18.9	0.118	-9	-9	-999	94	-7.9	0.212	0.48	0.18	0.8	115	10	299.4	3	0	9.65	94	1012	10
5	5	16	136	11	6.9	0.211	-9	-9	-999	224	-123.3	0.687	0.8	0.18	1.3	177	10	298.2	3	0	12.45	85	1012	10
5	5	16	136	12	0.6	0.167	-9	-9	-999	158	-664.4	0.687	0.8	0.18	1.1	199	10	297.9	3	0	3.05	94	1012	10
5	5	16	136	13	0.1	0.065	-9	-9	-999	44	-242.5	0.212	0.48	0.18	0.6	139	10	298	3	0	3.3	94	1011	10
5	5	16	136	14	0.4	0.097	-9	-9	-999	70	-209.4	0.212	0.48	0.18	0.9	104	10	297.8	3	0	17.78	94	1011	10
5	5	16	136	15	1.4	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	295.8	3	0	10.41	94	1010	10
5	5	16	136	16	9.4	0.128	-9	-9	-999	105	-20.1	0.562	0.7	0.19	0.7	85	10	296.9	3	0	1.27	94	1009	10
5	5	16	136	17	1.4	0.084	-9	-9	-999	56	-37.6	0.212	0.48	0.23	0.7	100	10	297.4	3	0	0.25	97	1009	10
5	5	16	136	18	0.1	0.085	-9	-9	-999	57	-557.2	0.562	0.7	0.37	0.6	83	10	297.5	3	0	0	94	1009	10
5	5	16	136	19	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.5	3	0	0	94	1010	7
5	5	16	136	20	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.6	3	0	0	94	1011	10
5	5	16	136	21	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	73	10	297.6	3	0	0	100	1011	7
5	5	16	136	22	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	87	10	297.8	3	0	0	94	1012	7
5	5	16	136	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.8	3	0	0	100	1012	10
5	5	16	136	24	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	102	10	297.8	3	0	0	100	1012	7
5	5	17	137	1	-0.9	0.042	-9	-9	-999	20	7.1	0.562	0.7	1	0.6	79	10	297.6	3	0	0	100	1011	10
5	5	17	137	2	-0.4	0.026	-9	-9	-999	10	3.8	0.212	0.48	1	0.5	95	10	297.5	3	0	0	100	1011	10
5	5	17	137	3	-0.4	0.026	-9	-9	-999	10	3.8	0.212	0.48	1	0.5	118	10	297.5	3	0	0	100	1010	10
5	5	17	137	4	-0.8	0.036	-9	-9	-999	16	5.4	0.212	0.48	1	0.7	95	10	297.6	3	0	0	100	1010	10
5	5	17	137	5	-0.4	0.026	-9	-9	-999	10	3.8	0.212	0.48	1	0.5	92	10	297.8	3	0	0	100	1011	10
5	5	17	137	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.4	3	0	0	100	1011	7
5	5	17	137	7	28	0.143	-9	-9	-999	125	-9.5	0.212	0.48	0.4	1	99	10	301.4	3	0	0	94	1012	0
5	5	17	137	8	50.4	0.202	-9	-9	-999	208	-14.7	0.212	0.48	0.23	1.5	114	10	302.2	3	0	0	82	1012	7
5	5	17	137	9	113.9	0.249	-9	-9	-999	285	-12.2	0.212	0.48	0.19	1.8	120	10	303.9	3	0	0	75	1013	0
5	5	17	137	10	120.9	0.25	-9	-9	-999	287	-11.6	0.212	0.48	0.18	1.8	116	10	304.9	3	0	0	66	1013	7
5	5	17	137	11	130.6	0.233	-9	-9	-999	258	-8.7	0.212	0.48	0.18	1.6	116	10	305.5	3	0	0	68	1012	8
5	5	17	137	12	124.9	0.231	-9	-9	-999	256	-8.9	0.212	0.48	0.18	1.6	110	10	305.9	3	0	0	58	1012	8
5	5	17	137	13	123.6	0.212	-9	-9	-999	224	-6.9	0.212	0.48	0.18	1.4	104	10	306.1	3	0	0	58	1010	8
5	5	17	137	14	134	0.233	-9	-9	-999	259	-8.5	0.212	0.48	0.18	1.6	117	10	306.4	3	0	0	52	1010	7
5	5	17	137	15	96.4	0.215	-9	-9	-999	230	-9.3	0.212	0.48	0.18	1.5	114	10	306.2	3	0	0	56	1009	8
5	5	17	137	16	61.3	0.196	-9	-9	-999	199	-11	0.212	0.48	0.19	1.4	86	10	305.6	3	0	0	56	1009	9
5	5	17	137	17	19.8	0.167	-9	-9	-999	157	-21	0.212	0.48	0.23	1.3	100	10	304.1	3	0	0	61	1009	10
5	5	17	137	18	0.1	0.115	-9	-9	-999	90	-1368.9	0.212	0.48	0.38	1.1	112	10	301.5	3	0	0	65	1009	3
5	5	17	137	19	-2.7	0.057	-9	-9	-999	32	6.1	0.212	0.48	1	1.1	114	10	300.1	3	0	0	79	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	17	137	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	98	10	299.4	3	0	0	82	1011	0
5	5	17	137	21	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	84	10	299.2	3	0	0	86	1012	0
5	5	17	137	22	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	82	10	298.6	3	0	0	90	1012	99
5	5	17	137	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	109	10	298.2	3	0	0	94	1012	3
5	5	17	137	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	95	10	298.2	3	0	0	94	1012	3
5	5	18	138	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	95	10	297.8	3	0	0	94	1011	3
5	5	18	138	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	80	10	297.5	3	0	0	97	1010	7
5	5	18	138	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	297.1	3	0	0	94	1010	7
5	5	18	138	4	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	92	10	296.9	3	0	0	100	1010	7
5	5	18	138	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.8	3	0	0	100	1010	7
5	5	18	138	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	78	10	298.4	3	0	0	100	1010	7
5	5	18	138	7	32.7	0.174	-9	-9	-999	167	-14.5	0.562	0.7	0.39	0.9	70	10	301.1	3	0	0	88	1011	0
5	5	18	138	8	76.1	0.22	-9	-9	-999	237	-12.6	0.212	0.48	0.23	1.6	99	10	302.9	3	0	0	79	1011	0
5	5	18	138	9	115.7	0.21	-9	-9	-999	221	-7.2	0.212	0.48	0.19	1.4	114	10	304.6	3	0	0	70	1012	0
5	5	18	138	10	146.4	0.215	-9	-9	-999	230	-6.2	0.212	0.48	0.18	1.4	120	10	305.9	3	0	0	61	1012	3
5	5	18	138	11	162.4	0.218	-9	-9	-999	234	-5.7	0.212	0.48	0.18	1.4	123	10	306.8	3	0	0	58	1011	5
5	5	18	138	12	116.6	0.158	-9	-9	-999	146	-3.1	0.212	0.48	0.18	0.9	120	10	307	3	0	0	56	1010	8
5	5	18	138	13	50.3	0.168	-9	-9	-999	158	-8.4	0.24	0.3	0.16	1.1	315	10	305.4	3	0	0	52	1009	10
5	5	18	138	14	60.7	0.35	-9	-9	-999	475	-63.3	0.562	0.7	0.18	2.2	335	10	303.6	3	0	0	54	1009	10
5	5	18	138	15	86.9	0.36	-9	-9	-999	496	-48.1	0.562	0.7	0.18	2.2	342	10	303.5	3	0	0	52	1008	9
5	5	18	138	16	35.2	0.287	-9	-9	-999	356	-60.6	0.562	0.7	0.19	1.8	347	10	303	3	0	0	58	1008	10
5	5	18	138	17	26.8	0.157	-9	-9	-999	152	-13.1	0.562	0.7	0.23	0.8	42	10	303.8	3	0	0	61	1008	10
5	5	18	138	18	0.1	0.146	-9	-9	-999	128	-2790	0.212	0.48	0.37	1.4	114	10	301.5	3	0	0	70	1009	3
5	5	18	138	19	-2.3	0.052	-9	-9	-999	33	5.6	0.212	0.48	1	1	103	10	300.4	3	0	0	79	1009	3
5	5	18	138	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	112	10	299.5	3	0	0	82	1010	3
5	5	18	138	21	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	105	10	299	3	0	0	88	1010	0
5	5	18	138	22	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	100	10	298.6	3	0	0	88	1010	0
5	5	18	138	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	106	10	298.4	3	0	0	88	1010	0
5	5	18	138	24	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	107	10	298.2	3	0	0	94	1009	0
5	5	19	139	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	108	10	297.8	3	0	0	94	1009	3
5	5	19	139	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	65	10	297.4	3	0	0	94	1008	0
5	5	19	139	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	53	10	297.2	3	0	0	94	1008	3
5	5	19	139	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	107	10	297	3	0	0	94	1008	3
5	5	19	139	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.9	3	0	0	97	1009	3
5	5	19	139	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299	3	0	0	94	1009	3
5	5	19	139	7	35.8	0.128	-9	-9	-999	105	-5.3	0.687	0.8	0.4	0.5	161	10	302.2	3	0	0	88	1010	0
5	5	19	139	8	87.2	0.249	-9	-9	-999	286	-15.9	0.687	0.8	0.23	1.2	162	10	303.4	3	0	0	80	1010	0
5	5	19	139	9	116.8	0.257	-9	-9	-999	300	-13.1	0.687	0.8	0.19	1.2	169	10	304.4	3	0	0	75	1010	7
5	5	19	139	10	137.3	0.315	-9	-9	-999	407	-20.5	0.674	0.73	0.17	1.6	218	10	305	3	0	0	66	1010	8
5	5	19	139	11	117.3	0.257	-9	-9	-999	300	-13	0.24	0.3	0.16	1.8	272	10	305.9	3	0	0	60	1010	5
5	5	19	139	12	116.4	0.246	-9	-9	-999	281	-11.5	0.24	0.3	0.16	1.7	272	10	306.1	3	0	0	64	1010	6
5	5	19	139	13	114.2	0.276	-9	-9	-999	333	-16.5	0.24	0.3	0.16	2	288	10	305.9	3	0	0	75	1009	7
5	5	19	139	14	68.3	0.279	-9	-9	-999	338	-28.5	0.562	0.7	0.18	1.6	356	10	303.8	3	0	0	94	1009	10
5	5	19	139	15	23.4	0.217	-9	-9	-999	234	-39.3	0.562	0.7	0.18	1.3	56	10	301.6	3	0	0	94	1008	10
5	5	19	139	16	19	0.214	-9	-9	-999	227	-46	0.562	0.7	0.19	1.3	62	10	301	3	0	0	91	1008	10
5	5	19	139	17	14.5	0.197	-9	-9	-999	201	-47	0.562	0.7	0.22	1.2	71	10	301.2	3	0	0	91	1008	10
5	5	19	139	18	0.1	0.167	-9	-9	-999	158	-4211.2	0.562	0.7	0.37	1.2	78	10	300.6	3	0	0	91	1008	10
5	5	19	139	19	-2	0.052	-9	-9	-999	39	6.3	0.212	0.48	1	1	109	10	299.8	3	0	0	88	1009	7
5	5	19	139	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	99	10	299.5	3	0	0	88	1010	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	19	139	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	87	10	299.4	3	0	0	94	1010	7
5	5	19	139	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	94	10	299	3	0	0	94	1011	7
5	5	19	139	23	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	75	10	298.8	3	0	0	94	1011	3
5	5	19	139	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	101	10	298.5	3	0	0	88	1010	3
5	5	20	140	1	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	95	10	298.2	3	0	0	92	1010	3
5	5	20	140	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	298.4	3	0	0	97	1009	3
5	5	20	140	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	298.1	3	0	0	95	1009	3
5	5	20	140	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	90	10	298.1	3	0	0	94	1010	3
5	5	20	140	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	99	10	298	3	0	0	97	1010	0
5	5	20	140	6	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	106	10	300.1	3	0	0	100	1011	7
5	5	20	140	7	26.5	0.142	-9	-9	-999	124	-9.8	0.212	0.48	0.39	1	110	10	302.8	3	0	0	88	1011	0
5	5	20	140	8	80.9	0.211	-9	-9	-999	223	-10.5	0.212	0.48	0.23	1.5	111	10	304.1	3	0	0	82	1012	0
5	5	20	140	9	100.2	0.216	-9	-9	-999	231	-9.1	0.212	0.48	0.19	1.5	123	10	304.9	3	0	0	80	1012	6
5	5	20	140	10	123	0.201	-9	-9	-999	207	-6	0.212	0.48	0.18	1.3	134	10	306	3	0	0	70	1012	7
5	5	20	140	11	147.8	0.236	-9	-9	-999	263	-8	0.212	0.48	0.18	1.6	117	10	307	3	0	0	64	1011	7
5	5	20	140	12	100.4	0.17	-9	-9	-999	162	-4.4	0.562	0.7	0.18	0.7	85	10	306.4	3	0	0	56	1010	9
5	5	20	140	13	71.2	0.28	-9	-9	-999	340	-27.7	0.562	0.7	0.18	1.6	343	10	305.1	3	0	0	56	1010	10
5	5	20	140	14	78	0.369	-9	-9	-999	515	-57.9	0.562	0.7	0.18	2.3	342	10	303.9	3	0	0	58	1009	10
5	5	20	140	15	33.9	0.299	-9	-9	-999	377	-70.7	0.562	0.7	0.18	1.9	344	10	303.4	3	0	0	60	1008	10
5	5	20	140	16	12.6	0.219	-9	-9	-999	238	-74.7	0.562	0.7	0.19	1.4	357	10	302.9	3	0	0	56	1009	10
5	5	20	140	17	8.4	0.127	-9	-9	-999	107	-21.8	0.562	0.7	0.22	0.7	33	10	302.9	3	0	0	62	1009	10
5	5	20	140	18	0.1	0.136	-9	-9	-999	115	-2241.8	0.212	0.48	0.37	1.3	123	10	302.4	3	0	0	70	1010	7
5	5	20	140	19	-2.4	0.057	-9	-9	-999	34	6.9	0.212	0.48	1	1.1	116	10	301.2	3	0	0	85	1011	7
5	5	20	140	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	111	10	300.5	3	0	0	85	1012	7
5	5	20	140	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	105	10	300.1	3	0	0	85	1012	7
5	5	20	140	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	103	10	299.9	3	0	0	88	1012	7
5	5	20	140	23	-2.3	0.056	-9	-9	-999	30	6.8	0.562	0.7	1	0.8	82	10	299.5	3	0	0	94	1012	0
5	5	20	140	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	71	10	299.1	3	0	0	94	1012	7
5	5	21	141	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	86	10	298.8	3	0	0	94	1011	7
5	5	21	141	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	102	10	298.6	3	0	0	91	1010	7
5	5	21	141	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	104	10	298.8	3	0	0	88	1010	7
5	5	21	141	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.4	3	0	0	88	1010	7
5	5	21	141	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	94	1011	7
5	5	21	141	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.5	3	0	0	94	1012	7
5	5	21	141	7	25.3	0.132	-9	-9	-999	110	-8.2	0.212	0.48	0.39	0.9	120	10	302.4	3	0	0	88	1012	0
5	5	21	141	8	76.5	0.239	-9	-9	-999	269	-16.1	0.212	0.48	0.23	1.8	138	10	303.6	3	0	0	77	1013	0
5	5	21	141	9	94.2	0.234	-9	-9	-999	261	-12.3	0.212	0.48	0.19	1.7	130	10	304.5	3	0	0	75	1013	7
5	5	21	141	10	116.7	0.2	-9	-9	-999	206	-6.2	0.212	0.48	0.18	1.3	129	10	305.4	3	0	0	66	1013	7
5	5	21	141	11	101.2	0.109	-9	-9	-999	85	-1.1	0.212	0.48	0.18	0.5	88	10	306.1	3	0	0	59	1013	9
5	5	21	141	12	87.9	0.235	-9	-9	-999	262	-13.3	0.562	0.7	0.18	1.2	336	10	304.5	3	0	0	56	1012	10
5	5	21	141	13	83.9	0.297	-9	-9	-999	372	-28	0.562	0.7	0.18	1.7	340	10	304.4	3	0	0	56	1010	10
5	5	21	141	14	47.3	0.232	-9	-9	-999	259	-23.8	0.562	0.7	0.18	1.3	350	10	303.5	3	0	0	58	1010	10
5	5	21	141	15	55	0.223	-9	-9	-999	242	-18.1	0.562	0.7	0.18	1.2	345	10	303.9	3	0	0	61	1009	10
5	5	21	141	16	26.8	0.123	-9	-9	-999	103	-6.2	0.212	0.48	0.19	0.8	94	10	304.2	3	0	0	61	1009	10
5	5	21	141	17	12.4	0.179	-9	-9	-999	174	-41.7	0.212	0.48	0.23	1.5	109	10	303.2	3	0	0	72	1009	10
5	5	21	141	18	0.1	0.115	-9	-9	-999	90	-1369.4	0.212	0.48	0.37	1.1	92	10	301.8	3	0	0	75	1010	7
5	5	21	141	19	-1	0.036	-9	-9	-999	20	4.4	0.212	0.48	1	0.7	97	10	300.8	3	0	0	79	1010	7
5	5	21	141	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	71	10	300.1	3	0	0	79	1011	7
5	5	21	141	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	299.5	3	0	0	82	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	21	141	22	-0.8	0.035	-9	-9	-999	15	4.9	0.562	0.7	1	0.5	54	10	299	3	0	0	82	1012	7
5	5	21	141	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	111	10	299	3	0	0	88	1012	0
5	5	21	141	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	79	10	299	3	0	0	88	1011	3
5	5	22	142	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	65	10	298.5	3	0	0	94	1010	3
5	5	22	142	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	42	10	298.5	3	0	0	94	1010	0
5	5	22	142	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	43	10	298.1	3	0	0	100	1010	3
5	5	22	142	4	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	28	10	298	3	0	0	100	1011	3
5	5	22	142	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	55	10	298	3	0	0	94	1011	0
5	5	22	142	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	94	10	299.8	3	0	0	94	1012	7
5	5	22	142	7	17.5	0.127	-9	-9	-999	104	-10.5	0.212	0.48	0.39	0.9	109	10	302.2	3	0	0	94	1013	0
5	5	22	142	8	62.5	0.216	-9	-9	-999	230	-14.5	0.212	0.48	0.23	1.6	118	10	303.6	3	0	0	80	1013	0
5	5	22	142	9	108.8	0.285	-9	-9	-999	350	-19.2	0.212	0.48	0.19	2.2	130	10	305.1	3	0	0	75	1014	2
5	5	22	142	10	139.3	0.244	-9	-9	-999	277	-9.4	0.212	0.48	0.18	1.7	130	10	306.1	3	0	0	80	1013	5
5	5	22	142	11	104.1	0.227	-9	-9	-999	248	-10.1	0.212	0.48	0.18	1.6	118	10	306	3	0	0	75	1013	9
5	5	22	142	12	118.4	0.257	-9	-9	-999	300	-13	0.687	0.8	0.18	1.2	140	10	306.4	3	0	0	66	1012	9
5	5	22	142	13	46.4	0.154	-9	-9	-999	143	-7.1	0.562	0.7	0.18	0.7	340	10	305	3	0	0	60	1010	10
5	5	22	142	14	24.4	0.151	-9	-9	-999	135	-12.7	0.212	0.48	0.18	1.1	119	10	304.8	3	0	0	60	1009	10
5	5	22	142	15	25.9	0.218	-9	-9	-999	234	-35.9	0.212	0.48	0.18	1.8	127	10	304.9	3	0	0	60	1009	10
5	5	22	142	16	16.7	0.192	-9	-9	-999	194	-38.4	0.212	0.48	0.19	1.6	124	10	304.6	3	0	0	58	1009	10
5	5	22	142	17	2.7	0.164	-9	-9	-999	153	-150.1	0.212	0.48	0.23	1.5	120	10	303.5	3	0	0	64	1009	10
5	5	22	142	18	0.1	0.136	-9	-9	-999	115	-2241.8	0.212	0.48	0.37	1.3	115	10	302.2	3	0	0	70	1010	3
5	5	22	142	19	-3.8	0.067	-9	-9	-999	41	7.3	0.212	0.48	1	1.3	120	10	301.4	3	0	0	80	1011	3
5	5	22	142	20	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	123	10	300.9	3	0	0	85	1012	0
5	5	22	142	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	106	10	300.4	3	0	0	88	1012	3
5	5	22	142	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	94	10	300.2	3	0	0	88	1012	3
5	5	22	142	23	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	78	10	299.6	3	0	0	88	1012	3
5	5	22	142	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	299	3	0	0	88	1012	3
5	5	23	143	1	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	90	10	298.9	3	0	0	88	1011	3
5	5	23	143	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	50	10	298.4	3	0	0	94	1010	7
5	5	23	143	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	87	10	298.4	3	0	0	94	1010	3
5	5	23	143	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	298.4	3	0	0	94	1010	3
5	5	23	143	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	110	10	298.8	3	0	0	94	1010	3
5	5	23	143	6	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	66	10	300.5	3	0	0	88	1011	3
5	5	23	143	7	32.4	0.147	-9	-9	-999	130	-8.9	0.562	0.7	0.39	0.7	75	10	302.9	3	0	0	80	1012	0
5	5	23	143	8	66.8	0.226	-9	-9	-999	248	-15.7	0.212	0.48	0.23	1.7	130	10	303.9	3	0	0	75	1011	0
5	5	23	143	9	91.4	0.243	-9	-9	-999	276	-14.2	0.212	0.48	0.19	1.8	136	10	304.9	3	0	0	70	1012	7
5	5	23	143	10	131.9	0.242	-9	-9	-999	274	-9.7	0.212	0.48	0.18	1.7	139	10	306.1	3	0	0	62	1011	6
5	5	23	143	11	123.6	0.212	-9	-9	-999	224	-6.9	0.212	0.48	0.18	1.4	128	10	306.4	3	0	0	61	1011	8
5	5	23	143	12	110.5	0.228	-9	-9	-999	251	-9.7	0.212	0.48	0.18	1.6	138	10	306.8	3	0	0	56	1010	9
5	5	23	143	13	107.8	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	306.6	3	0	0	56	1009	9
5	5	23	143	14	48.2	0.245	-9	-9	-999	279	-27.4	0.562	0.7	0.18	1.4	350	10	304.9	3	0	0	54	1008	10
5	5	23	143	15	47.7	0.269	-9	-9	-999	321	-36.8	0.562	0.7	0.18	1.6	351	10	304.2	3	0	0	52	1008	10
5	5	23	143	16	26.2	0.207	-9	-9	-999	217	-30.3	0.562	0.7	0.19	1.2	352	10	303.8	3	0	0	56	1008	10
5	5	23	143	17	10.8	0.155	-9	-9	-999	141	-30.9	0.562	0.7	0.22	0.9	84	10	303.9	3	0	0	60	1008	10
5	5	23	143	18	0.1	0.146	-9	-9	-999	128	-2790	0.212	0.48	0.37	1.4	112	10	302.2	3	0	0	70	1009	3
5	5	23	143	19	-2.7	0.057	-9	-9	-999	35	6.1	0.212	0.48	1	1.1	112	10	301.1	3	0	0	80	1009	3
5	5	23	143	20	-2.3	0.056	-9	-9	-999	30	6.8	0.562	0.7	1	0.8	85	10	300.5	3	0	0	85	1010	0
5	5	23	143	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	93	10	300.1	3	0	0	85	1011	3
5	5	23	143	22	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	97	10	299.4	3	0	0	85	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	23	143	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	61	10	299.2	3	0	0	88	1011	0
5	5	23	143	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	48	10	298.9	3	0	0	88	1010	3
5	5	24	144	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.8	3	0	0	88	1010	3
5	5	24	144	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.8	3	0	0	88	1010	0
5	5	24	144	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	80	10	298.2	3	0	0	94	1009	3
5	5	24	144	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298	3	0	0	94	1010	3
5	5	24	144	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	56	10	298	3	0	0	97	1010	0
5	5	24	144	6	-1.7	0.049	-9	-9	-999	25	6.1	0.562	0.7	1	0.7	72	10	300.2	3	0	0	100	1011	3
5	5	24	144	7	27.6	0.123	-9	-9	-999	100	-6.1	0.212	0.48	0.39	0.8	88	10	302.8	3	0	0	88	1012	0
5	5	24	144	8	59.9	0.176	-9	-9	-999	170	-8.2	0.212	0.48	0.23	1.2	121	10	304	3	0	0	72	1012	0
5	5	24	144	9	117.7	0.21	-9	-9	-999	222	-7.1	0.212	0.48	0.19	1.4	131	10	305.8	3	0	0	70	1012	0
5	5	24	144	10	78.3	0.14	-9	-9	-999	121	-3.1	0.212	0.48	0.18	0.8	133	10	305.8	3	0	0	70	1012	9
5	5	24	144	11	131.7	0.205	-9	-9	-999	214	-5.9	0.562	0.7	0.18	0.9	70	10	305.1	3	0	0	62	1012	8
5	5	24	144	12	92.3	0.153	-9	-9	-999	138	-3.5	0.562	0.7	0.18	0.6	352	10	305.6	3	0	0	85	1011	9
5	5	24	144	13	15.1	0.109	-9	-9	-999	82	-7.7	0.24	0.3	0.16	0.7	293	10	303.4	3	0	0.25	66	1010	10
5	5	24	144	14	9	0.132	-9	-9	-999	110	-23	0.24	0.3	0.16	1	315	10	301.4	3	0	0	66	1010	10
5	5	24	144	15	15.4	0.098	-9	-9	-999	71	-5.5	0.24	0.3	0.16	0.6	315	10	301.4	3	0	0	62	1009	10
5	5	24	144	16	25.3	0.156	-9	-9	-999	142	-13.6	0.562	0.7	0.19	0.8	358	10	302.2	3	0	0	60	1009	10
5	5	24	144	17	24.7	0.194	-9	-9	-999	196	-26.4	0.562	0.7	0.22	1.1	25	10	303.2	3	0	0	66	1009	10
5	5	24	144	18	0.1	0.112	-9	-9	-999	88	-1275.2	0.562	0.7	0.37	0.8	55	10	301.4	3	0	0	70	1010	7
5	5	24	144	19	-2.3	0.052	-9	-9	-999	28	5.6	0.212	0.48	1	1	110	10	300.9	3	0	0	85	1010	3
5	5	24	144	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	108	10	300.1	3	0	0	85	1012	3
5	5	24	144	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	100	10	299.8	3	0	0	85	1012	3
5	5	24	144	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	299.4	3	0	0	88	1013	3
5	5	24	144	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	79	10	299	3	0	0	88	1012	3
5	5	24	144	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	53	10	298.8	3	0	0	88	1012	3
5	5	25	145	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	52	10	298.2	3	0	0	88	1011	3
5	5	25	145	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	48	10	298.1	3	0	0	91	1011	0
5	5	25	145	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	56	10	298	3	0	0	88	1011	3
5	5	25	145	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	297.9	3	0	0	94	1011	3
5	5	25	145	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	74	10	298	3	0	0	94	1011	0
5	5	25	145	6	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	68	10	299.9	3	0	0	94	1012	3
5	5	25	145	7	33.7	0.174	-9	-9	-999	167	-14.2	0.562	0.7	0.39	0.9	79	10	302.5	3	0	0	88	1013	0
5	5	25	145	8	69.8	0.189	-9	-9	-999	188	-8.7	0.212	0.48	0.23	1.3	105	10	304.2	3	0	0	77	1013	0
5	5	25	145	9	108.8	0.228	-9	-9	-999	250	-9.8	0.212	0.48	0.19	1.6	125	10	305.1	3	0	0	70	1013	3
5	5	25	145	10	128.9	0.251	-9	-9	-999	290	-11.1	0.212	0.48	0.18	1.8	124	10	306.1	3	0	0	66	1013	6
5	5	25	145	11	141.7	0.264	-9	-9	-999	311	-11.7	0.212	0.48	0.18	1.9	117	10	306.8	3	0	0	62	1012	7
5	5	25	145	12	143.4	0.274	-9	-9	-999	330	-12.9	0.212	0.48	0.18	2	110	10	307	3	0	0	66	1012	7
5	5	25	145	13	131.4	0.271	-9	-9	-999	325	-13.7	0.212	0.48	0.18	2	111	10	306.9	3	0	0	75	1011	8
5	5	25	145	14	128.1	0.308	-9	-9	-999	394	-20.6	0.212	0.48	0.18	2.4	113	10	306.4	3	0	0	60	1011	8
5	5	25	145	15	97.6	0.292	-9	-9	-999	363	-22.9	0.212	0.48	0.18	2.3	111	10	305.6	3	0	0	60	1010	8
5	5	25	145	16	37.2	0.243	-9	-9	-999	276	-34.7	0.212	0.48	0.19	2	106	10	304.4	3	0	0	62	1010	10
5	5	25	145	17	15.2	0.219	-9	-9	-999	236	-62.1	0.212	0.48	0.23	1.9	109	10	303.4	3	0	0	70	1011	10
5	5	25	145	18	0.1	0.146	-9	-9	-999	129	-2795.6	0.212	0.48	0.37	1.4	115	10	301.9	3	0	0	75	1011	7
5	5	25	145	19	-2.4	0.057	-9	-9	-999	35	6.9	0.212	0.48	1	1.1	118	10	301	3	0	0	85	1012	7
5	5	25	145	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	112	10	300.5	3	0	0	85	1012	7
5	5	25	145	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	113	10	300.1	3	0	0	88	1013	7
5	5	25	145	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	299.8	3	0	0	88	1013	7
5	5	25	145	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	78	10	299.4	3	0	0	88	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	25	145	24	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	22	10	298.8	3	0	0	88	1012	7
5	5	26	146	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	64	10	298.5	3	0	0	82	1012	7
5	5	26	146	2	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.8	3	0	0	94	1012	7
5	5	26	146	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	83	10	298.9	3	0	0	94	1012	7
5	5	26	146	4	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	99	10	299.2	3	0	0	88	1012	7
5	5	26	146	5	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	101	10	299.5	3	0	0	88	1013	7
5	5	26	146	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	103	10	300.9	3	0	0	100	1013	7
5	5	26	146	7	16.5	0.173	-9	-9	-999	166	-28.6	0.212	0.48	0.39	1.4	109	10	302.4	3	0	0	88	1014	0
5	5	26	146	8	56.2	0.213	-9	-9	-999	227	-15.6	0.212	0.48	0.23	1.6	117	10	302.9	3	0	0	77	1014	6
5	5	26	146	9	112.7	0.277	-9	-9	-999	335	-17	0.212	0.48	0.19	2.1	117	10	304.8	3	0	0	80	1014	0
5	5	26	146	10	83.9	0.241	-9	-9	-999	273	-15.1	0.212	0.48	0.18	1.8	113	10	304.9	3	0	0	81	1014	9
5	5	26	146	11	117	0.306	-9	-9	-999	389	-22.1	0.212	0.48	0.18	2.4	135	10	305.1	3	0	0	82	1014	8
5	5	26	146	12	153.2	0.304	-9	-9	-999	386	-16.6	0.212	0.48	0.18	2.3	135	10	305.9	3	0	0	70	1013	7
5	5	26	146	13	159.5	0.352	-9	-9	-999	480	-24.7	0.212	0.48	0.18	2.8	126	10	306.4	3	0	0	66	1013	7
5	5	26	146	14	108.7	0.304	-9	-9	-999	386	-23.3	0.212	0.48	0.18	2.4	136	10	306.4	3	0	0	72	1012	8
5	5	26	146	15	67.7	0.283	-9	-9	-999	347	-30.2	0.212	0.48	0.18	2.3	129	10	305.4	3	0	0	75	1012	9
5	5	26	146	16	44.5	0.265	-9	-9	-999	314	-37.7	0.212	0.48	0.19	2.2	131	10	304.5	3	0	0	62	1012	9
5	5	26	146	17	9.5	0.223	-9	-9	-999	243	-105.6	0.212	0.48	0.23	2	127	10	303	3	0	0	61	1012	10
5	5	26	146	18	0.1	0.146	-9	-9	-999	130	-2798.3	0.212	0.48	0.37	1.4	120	10	301.9	3	0	0	65	1012	3
5	5	26	146	19	-3.3	0.062	-9	-9	-999	39	6.7	0.212	0.48	1	1.2	110	10	300.9	3	0	0	85	1012	3
5	5	26	146	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	92	10	300.4	3	0	0	85	1012	0
5	5	26	146	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	300	3	0	0	88	1013	3
5	5	26	146	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	299.8	3	0	0	88	1013	3
5	5	26	146	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	67	10	299.8	3	0	0	94	1013	3
5	5	26	146	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	64	10	299.4	3	0	0	94	1013	3
5	5	27	147	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	70	10	299.4	3	0	0	94	1013	3
5	5	27	147	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	73	10	299.4	3	0	0	97	1013	0
5	5	27	147	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	83	10	299	3	0	0	88	1013	7
5	5	27	147	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	81	10	298.9	3	0	0	100	1013	3
5	5	27	147	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	69	10	298.8	3	0	0	97	1013	7
5	5	27	147	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	127	10	299.4	3	0	0	94	1014	7
5	5	27	147	7	26.3	0.162	-9	-9	-999	149	-14.5	0.212	0.48	0.39	1.2	114	10	302.1	3	0	0	88	1014	0
5	5	27	147	8	61.1	0.234	-9	-9	-999	260	-18.9	0.212	0.48	0.23	1.8	123	10	303.8	3	0	0	82	1015	0
5	5	27	147	9	82.5	0.241	-9	-9	-999	271	-15.3	0.212	0.48	0.19	1.8	138	10	304.4	3	0	0	80	1015	8
5	5	27	147	10	106	0.247	-9	-9	-999	282	-12.8	0.212	0.48	0.18	1.8	128	10	304.6	3	0	0.25	75	1015	8
5	5	27	147	11	156.1	0.266	-9	-9	-999	316	-10.9	0.212	0.48	0.18	1.9	94	10	305.9	3	0	0	66	1014	6
5	5	27	147	12	95.9	0.244	-9	-9	-999	278	-13.7	0.212	0.48	0.18	1.8	118	10	304.4	3	0	0	88	1014	9
5	5	27	147	13	90.3	0.252	-9	-9	-999	291	-16.1	0.212	0.48	0.18	1.9	106	10	305.2	3	0	0	84	1013	9
5	5	27	147	14	94.9	0.263	-9	-9	-999	310	-17.2	0.212	0.48	0.18	2	102	10	305.6	3	0	0	80	1013	9
5	5	27	147	15	83.3	0.333	-9	-9	-999	442	-40.1	0.562	0.7	0.18	2	63	10	303.9	3	0	0	91	1012	9
5	5	27	147	16	30.5	0.192	-9	-9	-999	205	-21	0.212	0.48	0.19	1.5	87	10	302.9	3	0	0	85	1012	10
5	5	27	147	17	7.7	0.173	-9	-9	-999	166	-61	0.212	0.48	0.22	1.5	107	10	302.2	3	0	0	85	1013	10
5	5	27	147	18	0.1	0.115	-9	-9	-999	90	-1373.4	0.212	0.48	0.37	1.1	108	10	301.2	3	0	0	91	1013	7
5	5	27	147	19	-1.3	0.042	-9	-9	-999	22	5	0.212	0.48	1	0.8	87	10	300.5	3	0	0	91	1013	7
5	5	27	147	20	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	300	3	0	0	88	1014	7
5	5	27	147	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	81	10	299.5	3	0	0	88	1014	7
5	5	27	147	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	299.6	3	0	0	94	1014	7
5	5	27	147	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	54	10	298.9	3	0	0	88	1014	3
5	5	27	147	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	74	10	298.6	3	0	0	94	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	28	148	1	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	107	10	298.6	3	0	0	94	1013	0
5	5	28	148	2	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	98	10	298.6	3	0	0	91	1013	3
5	5	28	148	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	117	10	298.2	3	0	0	94	1013	3
5	5	28	148	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	298.1	3	0	0	88	1013	3
5	5	28	148	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	298.4	3	0	0	97	1013	0
5	5	28	148	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	55	10	299.1	3	0	0	94	1014	7
5	5	28	148	7	26.3	0.157	-9	-9	-999	143	-13.3	0.562	0.7	0.39	0.8	53	10	302	3	0	0	94	1014	0
5	5	28	148	8	83	0.22	-9	-9	-999	238	-11.6	0.562	0.7	0.23	1.1	69	10	303.8	3	0	0	88	1014	0
5	5	28	148	9	108.7	0.228	-9	-9	-999	250	-9.8	0.212	0.48	0.19	1.6	88	10	304.8	3	0	0	75	1014	4
5	5	28	148	10	143.6	0.244	-9	-9	-999	278	-9.2	0.212	0.48	0.18	1.7	100	10	306.1	3	0	0	66	1014	4
5	5	28	148	11	155.1	0.256	-9	-9	-999	298	-9.8	0.212	0.48	0.18	1.8	110	10	306.9	3	0	0	66	1013	6
5	5	28	148	12	139.1	0.244	-9	-9	-999	277	-9.4	0.212	0.48	0.18	1.7	108	10	307.2	3	0	0	66	1012	8
5	5	28	148	13	139.2	0.263	-9	-9	-999	310	-11.8	0.212	0.48	0.18	1.9	106	10	307.4	3	0	0	56	1012	8
5	5	28	148	14	128.5	0.271	-9	-9	-999	324	-13.9	0.212	0.48	0.18	2	99	10	307	3	0	0	58	1011	8
5	5	28	148	15	89.1	0.252	-9	-9	-999	291	-16.2	0.212	0.48	0.18	1.9	101	10	306.4	3	0	0	60	1011	9
5	5	28	148	16	58.3	0.261	-9	-9	-999	307	-27.5	0.212	0.48	0.19	2.1	91	10	305.6	3	0	0	62	1011	9
5	5	28	148	17	16.2	0.229	-9	-9	-999	253	-67	0.212	0.48	0.22	2	92	10	302.4	3	0	0	85	1011	10
5	5	28	148	18	0.1	0.125	-9	-9	-999	106	-1772.3	0.212	0.48	0.37	1.2	100	10	301.4	3	0	0	91	1012	3
5	5	28	148	19	-3.8	0.067	-9	-9	-999	41	7.2	0.212	0.48	1	1.3	106	10	300	3	0	0	94	1012	3
5	5	28	148	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	118	10	299.2	3	0	0	88	1012	3
5	5	28	148	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	299.4	3	0	0	88	1013	3
5	5	28	148	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	64	10	299.4	3	0	0	88	1013	3
5	5	28	148	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	299.5	3	0	0	88	1014	3
5	5	28	148	24	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	103	10	299.4	3	0	0	94	1013	7
5	5	29	149	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	86	10	299.1	3	0	0	94	1012	3
5	5	29	149	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	298.8	3	0	0	94	1012	7
5	5	29	149	3	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	82	10	298.1	3	0	0	999	1012	7
5	5	29	149	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1	86	10	297.9	3	0	0	999	1012	99
5	5	29	149	5	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	97	10	298.1	3	0	0	999	1013	99
5	5	29	149	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	83	10	299	3	0	0	999	1013	99
5	5	29	149	7	8.2	0.118	-9	-9	-999	93	-18	0.212	0.48	0.39	0.9	101	10	300.5	3	0	0	999	1014	3
5	5	29	149	8	56.7	0.242	-9	-9	-999	273	-22.5	0.212	0.48	0.23	1.9	96	10	301.1	3	0	0	91	1015	6
5	5	29	149	9	42.7	0.217	-9	-9	-999	233	-21.7	0.212	0.48	0.19	1.7	111	10	300.9	3	0	0	94	1015	9
5	5	29	149	10	37.5	0.215	-9	-9	-999	229	-23.9	0.212	0.48	0.18	1.7	118	10	301	3	0	0	88	1014	10
5	5	29	149	11	36	0.205	-9	-9	-999	213	-21.4	0.212	0.48	0.18	1.6	129	10	300.9	3	0	0	94	1013	10
5	5	29	149	12	36.1	0.186	-9	-9	-999	184	-16.1	0.212	0.48	0.18	1.4	107	10	301.1	3	0	0	88	1013	10
5	5	29	149	13	40.9	0.198	-9	-9	-999	202	-17	0.212	0.48	0.18	1.5	124	10	301.8	3	0	0	85	1012	10
5	5	29	149	14	53	0.193	-9	-9	-999	195	-12.3	0.212	0.48	0.18	1.4	110	10	302.2	3	0	0	85	1011	10
5	5	29	149	15	50	0.202	-9	-9	-999	208	-14.7	0.212	0.48	0.18	1.5	103	10	302.4	3	0	0	80	1010	10
5	5	29	149	16	30.3	0.202	-9	-9	-999	208	-24.3	0.212	0.48	0.19	1.6	114	10	302.4	3	0	0	80	1010	10
5	5	29	149	17	8.8	0.147	-9	-9	-999	130	-32.3	0.212	0.48	0.22	1.2	110	10	301.6	3	0	0	77	1011	10
5	5	29	149	18	0.1	0.115	-9	-9	-999	90	-1371.2	0.212	0.48	0.37	1.1	86	10	300.5	3	0	0	75	1011	7
5	5	29	149	19	-1.6	0.047	-9	-9	-999	25	5.6	0.212	0.48	1	0.9	99	10	300	3	0	0	88	1011	7
5	5	29	149	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	70	10	299.5	3	0	0	91	1012	7
5	5	29	149	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	52	10	299.1	3	0	0	88	1012	7
5	5	29	149	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	68	10	298.9	3	0	0	88	1013	7
5	5	29	149	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	298.8	3	0	0	91	1012	7
5	5	29	149	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	66	10	299	3	0	0	94	1012	7
5	5	30	150	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	298.9	3	0	0	94	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	5	30	150	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	49	10	298.5	3	0	0	97	1011	7
5	5	30	150	3	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	130	10	298.5	3	0	0.25	94	1011	7
5	5	30	150	4	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	119	10	298.1	3	0	0	100	1012	7
5	5	30	150	5	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	91	10	297.9	3	0	0	97	1012	7
5	5	30	150	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.9	3	0	0	94	1013	3
5	5	30	150	7	6.4	0.134	-9	-9	-999	113	-34	0.212	0.48	0.39	1.1	91	10	298.6	3	0	0	88	1014	8
5	5	30	150	8	36.7	0.177	-9	-9	-999	171	-13.6	0.212	0.48	0.23	1.3	114	10	299.4	3	0	0.25	94	1014	8
5	5	30	150	9	98.9	0.307	-9	-9	-999	390	-26.3	0.687	0.8	0.19	1.6	149	10	301.5	3	0	0	82	1014	8
5	5	30	150	10	84.4	0.248	-9	-9	-999	285	-16.3	0.687	0.8	0.18	1.2	158	10	302.1	3	0	0	82	1014	9
5	5	30	150	11	90.4	0.291	-9	-9	-999	360	-24.5	0.687	0.8	0.18	1.5	161	10	301.4	3	0	0	82	1014	9
5	5	30	150	12	76.3	0.312	-9	-9	-999	400	-35.8	0.687	0.8	0.18	1.7	142	10	301.5	3	0	0	66	1013	10
5	5	30	150	13	55.9	0.213	-9	-9	-999	230	-15.7	0.212	0.48	0.18	1.6	128	10	301.9	3	0	0	80	1013	10
5	5	30	150	14	53.2	0.231	-9	-9	-999	255	-20.9	0.212	0.48	0.18	1.8	122	10	302.5	3	0	0	85	1012	10
5	5	30	150	15	54.7	0.213	-9	-9	-999	226	-15.9	0.212	0.48	0.18	1.6	98	10	302.9	3	0	0	80	1011	10
5	5	30	150	16	38	0.196	-9	-9	-999	200	-17.9	0.212	0.48	0.19	1.5	102	10	303.1	3	0	0	80	1011	10
5	5	30	150	17	7.6	0.164	-9	-9	-999	152	-52	0.212	0.48	0.22	1.4	105	10	302	3	0	0	72	1011	10
5	5	30	150	18	0.1	0.115	-9	-9	-999	90	-1371.6	0.212	0.48	0.36	1.1	96	10	300.9	3	0	0	79	1012	7
5	5	30	150	19	-1.6	0.047	-9	-9	-999	25	5.6	0.212	0.48	1	0.9	110	10	299.9	3	0	0	88	1012	7
5	5	30	150	20	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	88	10	299.4	3	0	0	88	1012	7
5	5	30	150	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	107	10	299.2	3	0	0	88	1013	7
5	5	30	150	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	299.1	3	0	0	88	1013	7
5	5	30	150	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.1	3	0	0	94	1013	7
5	5	30	150	24	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	126	10	298.9	3	0	0	94	1013	7
5	5	31	151	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.5	3	0	0	94	1012	7
5	5	31	151	2	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	135	10	298.2	3	0	0	97	1012	7
5	5	31	151	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	109	10	298.2	3	0	0	94	1012	3
5	5	31	151	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298	3	0	0	94	1012	7
5	5	31	151	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.4	3	0	0	94	1012	7
5	5	31	151	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	299.4	3	0	0	94	1013	3
5	5	31	151	7	18.3	0.137	-9	-9	-999	117	-12.7	0.212	0.48	0.39	1	112	10	301.8	3	0	0	94	1013	0
5	5	31	151	8	72.1	0.303	-9	-9	-999	384	-34.9	0.212	0.48	0.23	2.5	117	10	303.5	3	0	0	91	1014	0
5	5	31	151	9	91.1	0.271	-9	-9	-999	325	-19.8	0.212	0.48	0.19	2.1	108	10	304.2	3	0	0	75	1014	7
5	5	31	151	10	127.1	0.308	-9	-9	-999	393	-20.8	0.212	0.48	0.18	2.4	115	10	305.5	3	0	0	66	1014	6
5	5	31	151	11	94.7	0.253	-9	-9	-999	294	-15.5	0.212	0.48	0.18	1.9	120	10	305.2	3	0	0	60	1014	9
5	5	31	151	12	83.8	0.269	-9	-9	-999	321	-21	0.212	0.48	0.18	2.1	133	10	304.2	3	0	0	58	1014	9
5	5	31	151	13	93.3	0.328	-9	-9	-999	432	-34.2	0.212	0.48	0.18	2.7	124	10	305.1	3	0	0	66	1013	9
5	5	31	151	14	67.5	0.283	-9	-9	-999	347	-30.3	0.212	0.48	0.18	2.3	115	10	304.5	3	0	0	68	1013	9
5	5	31	151	15	74.6	0.238	-9	-9	-999	268	-16.4	0.212	0.48	0.18	1.8	96	10	304.1	3	0	0	70	1012	9
5	5	31	151	16	35.7	0.176	-9	-9	-999	171	-13.8	0.212	0.48	0.19	1.3	135	10	301.4	3	0	0.25	80	1012	10
5	5	31	151	17	10	0.148	-9	-9	-999	131	-29.4	0.212	0.48	0.22	1.2	106	10	301	3	0	0	88	1012	10
5	5	31	151	18	0.1	0.153	-9	-9	-999	138	-3267.2	0.562	0.7	0.36	1.1	79	10	300.5	3	0	0	79	1013	10
5	5	31	151	19	-2	0.056	-9	-9	-999	36	7.8	0.562	0.7	1	0.8	67	10	299.8	3	0	0	88	1014	7
5	5	31	151	20	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	83	10	299.2	3	0	0	91	1014	0
5	5	31	151	21	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	84	10	299.2	3	0	0	82	1014	7
5	5	31	151	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	96	10	298.8	3	0	0	82	1014	7
5	5	31	151	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	106	10	298.5	3	0	0.76	94	1014	7
5	5	31	151	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	101	10	297.9	3	0	0	94	1014	3
5	6	1	152	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	95	10	297.9	3	0	0	94	1013	3
5	6	1	152	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	297.9	3	0	0	91	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	1	152	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	297.9	3	0	0	94	1013	7
5	6	1	152	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	297.8	3	0	0	94	1013	7
5	6	1	152	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	62	10	297.4	3	0	0	97	1013	7
5	6	1	152	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	105	10	298.5	3	0	0	94	1014	7
5	6	1	152	7	16.8	0.133	-9	-9	-999	112	-12.7	0.37	0.38	0.4	0.8	110	10	301	3	0	0	88	1014	0
5	6	1	152	8	50.6	0.208	-9	-9	-999	219	-16.2	0.37	0.38	0.24	1.3	97	10	303.1	3	0	0	82	1014	5
5	6	1	152	9	53.4	0.21	-9	-9	-999	221	-15.6	0.37	0.38	0.2	1.3	102	10	301.5	3	0	4.06	80	1015	8
5	6	1	152	10	114.2	0.295	-9	-9	-999	369	-20.3	0.37	0.38	0.19	1.9	100	10	304.9	3	0	0	70	1014	5
5	6	1	152	11	109.8	0.315	-9	-9	-999	407	-25.8	0.37	0.38	0.18	2.1	88	10	305.1	3	0	0	66	1014	7
5	6	1	152	12	91.3	0.321	-9	-9	-999	418	-32.8	0.37	0.38	0.18	2.2	100	10	305.4	3	0	0	62	1013	9
5	6	1	152	13	77.4	0.346	-9	-9	-999	468	-48.4	0.736	0.77	0.17	1.9	151	10	301.9	3	0	0.25	58	1013	10
5	6	1	152	14	57.7	0.31	-9	-9	-999	397	-46.4	0.37	0.38	0.18	2.2	134	10	303.5	3	0	0	60	1012	9
5	6	1	152	15	30.3	0.242	-9	-9	-999	275	-42.1	0.37	0.38	0.19	1.7	134	10	300.9	3	0	0	70	1012	10
5	6	1	152	16	17.3	0.199	-9	-9	-999	205	-41.4	0.37	0.38	0.2	1.4	111	10	296.6	3	0	0.51	75	1011	10
5	6	1	152	17	5.4	0.162	-9	-9	-999	151	-71.6	0.37	0.38	0.23	1.2	127	10	302.5	2	0	1.52	75	1012	10
5	6	1	152	18	0.1	0.158	-9	-9	-999	145	-3577.5	0.37	0.38	0.37	1.3	111	10	298.1	3	0	3.05	94	1013	0
5	6	1	152	19	-2.3	0.055	-9	-9	-999	37	6.3	0.37	0.38	1	0.9	109	10	298	3	0	0	88	1013	3
5	6	1	152	20	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	117	10	298	3	0	0	97	1013	0
5	6	1	152	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	298	3	0	0	88	1014	7
5	6	1	152	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	68	10	297.9	3	0	0	94	1014	7
5	6	1	152	23	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	94	10	298	3	0	0.25	97	1014	7
5	6	1	152	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	111	10	297.9	3	0	0	100	1013	3
5	6	2	153	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	118	10	297.9	3	0	0	94	1012	7
5	6	2	153	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	129	10	297.6	3	0	0	97	1012	7
5	6	2	153	3	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	146	10	297.5	3	0	2.03	100	1012	7
5	6	2	153	4	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	91	10	297.4	3	0	10.41	94	1012	7
5	6	2	153	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	75	10	297.4	3	0	0.76	97	1013	7
5	6	2	153	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.4	3	0	0	94	1013	3
5	6	2	153	7	1	0.162	-9	-9	-999	150	-392.7	0.37	0.38	0.4	1.3	94	10	297.1	3	0	2.54	94	1014	10
5	6	2	153	8	10	0.2	-9	-9	-999	206	-72.4	0.655	0.64	0.23	1.2	84	10	297	3	0	2.29	94	1014	10
5	6	2	153	9	69.8	0.193	-9	-9	-999	195	-9.3	0.37	0.38	0.2	1.1	94	10	299.2	3	0	0.25	94	1014	7
5	6	2	153	10	118.9	0.263	-9	-9	-999	310	-13.8	0.37	0.38	0.19	1.6	108	10	302	3	0	0	94	1014	0
5	6	2	153	11	173	0.361	-9	-9	-999	498	-24.5	0.655	0.64	0.18	1.9	85	10	303.1	3	0	0	85	1013	7
5	6	2	153	12	109.3	0.348	-9	-9	-999	472	-34.8	0.37	0.38	0.18	2.4	104	10	303.6	3	0	0	75	1013	8
5	6	2	153	13	80.1	0.296	-9	-9	-999	371	-29.2	0.37	0.38	0.18	2	90	10	302.8	3	0	0	75	1012	9
5	6	2	153	14	32.9	0.254	-9	-9	-999	295	-45	0.37	0.38	0.18	1.8	107	10	301	3	0	3.56	80	1012	10
5	6	2	153	15	18.5	0.146	-9	-9	-999	133	-15.1	0.37	0.38	0.19	0.9	89	10	299.5	3	0	0	94	1011	10
5	6	2	153	16	14.6	0.175	-9	-9	-999	168	-33	0.37	0.38	0.2	1.2	96	10	299.9	3	0	0	88	1010	10
5	6	2	153	17	3.2	0.18	-9	-9	-999	176	-164	0.37	0.38	0.23	1.4	100	10	299.9	3	0	0	91	1010	10
5	6	2	153	18	0.1	0.146	-9	-9	-999	129	-2815.2	0.37	0.38	0.37	1.2	102	10	299.4	3	0	0	94	1010	7
5	6	2	153	19	-3.1	0.067	-9	-9	-999	42	8.7	0.37	0.38	1	1.1	87	10	299.2	3	0	0	94	1011	7
5	6	2	153	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	68	10	299	3	0	0	88	1012	7
5	6	2	153	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	298.9	3	0	0	88	1013	7
5	6	2	153	22	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	77	10	298.5	3	0	0	88	1013	7
5	6	2	153	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	76	10	298	3	0	0	97	1013	7
5	6	2	153	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	297.9	3	0	0	94	1012	7
5	6	3	154	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	62	10	297.8	3	0	0	94	1011	7
5	6	3	154	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	297.8	3	0	0	97	1010	7
5	6	3	154	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297.9	3	0	0	88	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	3	154	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.9	3	0	0	94	1010	7
5	6	3	154	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.8	3	0	0	97	1011	7
5	6	3	154	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.4	3	0	0	94	1012	7
5	6	3	154	7	25.3	0.163	-9	-9	-999	152	-15.5	0.655	0.64	0.39	0.8	58	10	300	3	0	0.51	94	1012	0
5	6	3	154	8	30.4	0.165	-9	-9	-999	154	-13.3	0.37	0.38	0.24	1	110	10	301	3	0	0	94	1013	9
5	6	3	154	9	15.5	0.165	-9	-9	-999	154	-26.1	0.37	0.38	0.2	1.1	106	10	299	3	0	3.56	94	1013	10
5	6	3	154	10	26	0.128	-9	-9	-999	106	-7.4	0.37	0.38	0.19	0.7	121	10	299.5	3	0	0.25	88	1013	10
5	6	3	154	11	50.3	0.186	-9	-9	-999	185	-11.6	0.37	0.38	0.18	1.1	112	10	300.5	3	0	1.27	82	1013	10
5	6	3	154	12	112.7	0.239	-9	-9	-999	269	-11	0.37	0.38	0.18	1.4	118	10	302.5	3	0	0	94	1012	8
5	6	3	154	13	62.5	0.246	-9	-9	-999	281	-21.6	0.37	0.38	0.18	1.6	123	10	302.9	3	0	0	80	1011	9
5	6	3	154	14	8.5	0.238	-9	-9	-999	266	-142.2	0.655	0.64	0.18	1.5	84	10	299.4	3	0	0.25	97	1011	10
5	6	3	154	15	4.3	0.117	-9	-9	-999	99	-33.3	0.37	0.38	0.19	0.8	104	10	298.4	3	0	0.25	100	1010	10
5	6	3	154	16	11.6	0.189	-9	-9	-999	189	-52.7	0.655	0.64	0.19	1.1	85	10	298.6	3	0	0	94	1010	10
5	6	3	154	17	2.2	0.144	-9	-9	-999	126	-120	0.655	0.64	0.22	0.9	69	10	298.4	3	0	0.25	94	1010	10
5	6	3	154	18	0.1	0.104	-9	-9	-999	77	-1015.7	0.655	0.64	0.36	0.7	78	10	298.1	3	0	0	94	1011	7
5	6	3	154	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	70	10	298	3	0	0	100	1012	7
5	6	3	154	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	80	10	297.9	3	0	0	97	1012	7
5	6	3	154	21	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	110	10	297.5	3	0	0.51	100	1013	7
5	6	3	154	22	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	113	10	297.4	3	0	0.51	100	1012	7
5	6	3	154	23	-6.5	0.097	-9	-9	-999	70	12.6	0.37	0.38	1	1.6	101	10	297.2	3	0	0.76	100	1012	7
5	6	3	154	24	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	103	10	297.4	3	0	0.25	94	1012	7
5	6	4	155	1	-5	0.085	-9	-9	-999	57	11	0.37	0.38	1	1.4	92	10	297.2	3	0	0	100	1011	7
5	6	4	155	2	-4.7	0.091	-9	-9	-999	63	14.5	0.37	0.38	1	1.5	113	10	297.2	3	0	0.25	97	1010	10
5	6	4	155	3	-3.5	0.079	-9	-9	-999	51	12.6	0.37	0.38	1	1.3	117	10	297.6	3	0	0	94	1010	10
5	6	4	155	4	-4.7	0.091	-9	-9	-999	63	14.6	0.37	0.38	1	1.5	124	10	297.9	3	0	0.51	94	1010	10
5	6	4	155	5	-3.5	0.079	-9	-9	-999	51	12.6	0.37	0.38	1	1.3	117	10	297.4	3	0	0.25	100	1010	10
5	6	4	155	6	-6.5	0.097	-9	-9	-999	70	12.6	0.37	0.38	1	1.6	132	10	297.9	3	0	1.78	94	1011	7
5	6	4	155	7	2.3	0.295	-9	-9	-999	369	-999.6	0.736	0.77	0.39	1.9	147	10	298.4	3	0	0.25	94	1012	10
5	6	4	155	8	19.2	0.223	-9	-9	-999	243	-52	0.37	0.38	0.24	1.6	138	10	298.6	3	0	0	100	1012	10
5	6	4	155	9	34.2	0.277	-9	-9	-999	334	-55.8	0.37	0.38	0.2	2	139	10	299.4	3	0	0	88	1012	10
5	6	4	155	10	80.1	0.307	-9	-9	-999	391	-32.5	0.736	0.77	0.18	1.6	140	10	300.4	3	0	0	94	1013	9
5	6	4	155	11	105.1	0.315	-9	-9	-999	407	-26.9	0.736	0.77	0.17	1.6	156	10	301.4	3	0	0	88	1013	9
5	6	4	155	12	140.1	0.338	-9	-9	-999	452	-24.9	0.736	0.77	0.17	1.7	166	10	302.5	3	0	0	80	1012	9
5	6	4	155	13	165	0.33	-9	-9	-999	436	-19.6	0.736	0.77	0.17	1.6	153	10	303.8	3	0	0	80	1010	8
5	6	4	155	14	132.7	0.364	-9	-9	-999	505	-32.7	0.736	0.77	0.17	1.9	141	10	303.6	3	0	0	72	1010	9
5	6	4	155	15	33.1	0.254	-9	-9	-999	301	-44.7	0.37	0.38	0.19	1.8	137	10	301.8	3	0	0	75	1009	10
5	6	4	155	16	16.3	0.198	-9	-9	-999	204	-43.2	0.37	0.38	0.2	1.4	124	10	300.9	3	0	0	91	1009	10
5	6	4	155	17	7	0.165	-9	-9	-999	155	-58.1	0.37	0.38	0.23	1.2	104	10	300.4	3	0	0	88	1010	10
5	6	4	155	18	0.1	0.122	-9	-9	-999	98	-1643.1	0.37	0.38	0.36	1	103	10	299.8	3	0	0	88	1010	7
5	6	4	155	19	-2.1	0.055	-9	-9	-999	31	7.1	0.37	0.38	1	0.9	95	10	299.2	3	0	0	88	1011	7
5	6	4	155	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	83	10	298.9	3	0	0	91	1012	7
5	6	4	155	21	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	86	10	298.5	3	0	0	88	1012	7
5	6	4	155	22	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	86	10	298.4	3	0	0	88	1012	7
5	6	4	155	23	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	95	10	298.6	3	0	0	91	1012	7
5	6	4	155	24	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	110	10	298.9	3	0	0	94	1012	7
5	6	5	156	1	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	103	10	298.9	3	0	0	94	1011	7
5	6	5	156	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	94	10	299	3	0	0	97	1010	7
5	6	5	156	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	101	10	298.9	3	0	0	94	1010	7
5	6	5	156	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	298.5	3	0	0	94	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	5	156	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	298.6	3	0	0	94	1011	7
5	6	5	156	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	100	10	299.1	3	0	0	94	1012	7
5	6	5	156	7	3.6	0.137	-9	-9	-999	116	-63.6	0.37	0.38	0.4	1	115	10	300.5	3	0	0	92	1013	0
5	6	5	156	8	35.2	0.255	-9	-9	-999	297	-42.8	0.37	0.38	0.24	1.8	122	10	301.5	3	0	0	91	1013	8
5	6	5	156	9	73.8	0.283	-9	-9	-999	346	-27.7	0.37	0.38	0.2	1.9	130	10	303.1	3	0	0	80	1013	7
5	6	5	156	10	176.6	0.36	-9	-9	-999	497	-23.9	0.736	0.77	0.18	1.8	143	10	304.4	3	0	0	75	1013	6
5	6	5	156	11	107	0.315	-9	-9	-999	407	-26.3	0.37	0.38	0.18	2.1	126	10	304.4	3	0	0	72	1013	8
5	6	5	156	12	116.7	0.262	-9	-9	-999	310	-14	0.736	0.77	0.17	1.2	157	10	303.6	3	0	0	70	1012	9
5	6	5	156	13	80.9	0.253	-9	-9	-999	293	-18	0.37	0.38	0.18	1.6	137	10	304.6	3	0	0	75	1011	9
5	6	5	156	14	107.4	0.302	-9	-9	-999	381	-23.1	0.736	0.77	0.17	1.5	147	10	304.9	3	0	0	77	1010	9
5	6	5	156	15	64.4	0.203	-9	-9	-999	214	-11.7	0.37	0.38	0.19	1.2	128	10	304.8	3	0	0	75	1010	9
5	6	5	156	16	19.7	0.202	-9	-9	-999	208	-37.4	0.37	0.38	0.2	1.4	104	10	303.4	3	0	0	70	1010	10
5	6	5	156	17	7.7	0.166	-9	-9	-999	156	-53.9	0.37	0.38	0.23	1.2	104	10	302.4	3	0	0	75	1010	10
5	6	5	156	18	0.1	0.146	-9	-9	-999	129	-2816.1	0.37	0.38	0.36	1.2	113	10	301	3	0	0	79	1011	7
5	6	5	156	19	-3.1	0.067	-9	-9	-999	42	8.7	0.37	0.38	1	1.1	114	10	300	3	0	0	88	1012	7
5	6	5	156	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	110	10	299.5	3	0	0	91	1012	7
5	6	5	156	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	58	10	299.4	3	0	0	88	1013	7
5	6	5	156	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	66	10	299.2	3	0	0	88	1013	7
5	6	5	156	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	299.1	3	0	0	91	1013	7
5	6	5	156	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	299	3	0	0	94	1012	7
5	6	6	157	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	75	10	298.9	3	0	0	88	1012	7
5	6	6	157	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	298.6	3	0	0	94	1011	7
5	6	6	157	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	51	10	298.5	3	0	0	94	1011	7
5	6	6	157	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.4	3	0	0	100	1011	7
5	6	6	157	5	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	61	10	298.2	3	0	0	97	1012	7
5	6	6	157	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	3	0	0	100	1012	7
5	6	6	157	7	12.1	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.38	0	0	10	301.4	3	0	0	94	1013	0
5	6	6	157	8	58	0.166	-9	-9	-999	156	-7.1	0.37	0.38	0.24	0.9	117	10	303.1	3	0	0	82	1013	0
5	6	6	157	9	102.5	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.18	0	0	10	304.4	3	0	0	85	1013	7
5	6	6	157	10	66	0.316	-9	-9	-999	409	-43.3	0.655	0.64	0.18	1.8	342	10	302.4	3	0	0	70	1013	10
5	6	6	157	11	25.7	0.268	-9	-9	-999	320	-67.8	0.655	0.64	0.18	1.6	2	10	301.1	3	0	1.78	70	1013	10
5	6	6	157	12	13	0.198	-9	-9	-999	204	-54	0.736	0.77	0.17	1.1	181	10	298.4	3	0	7.37	88	1013	10
5	6	6	157	13	23.2	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.16	0	0	10	299.6	3	0	1.27	88	1012	10
5	6	6	157	14	13.6	0.141	-9	-9	-999	122	-18.7	0.37	0.38	0.18	0.9	101	10	299.9	3	0	0	85	1010	10
5	6	6	157	15	17.3	0.178	-9	-9	-999	172	-29.1	0.37	0.38	0.19	1.2	94	10	299.9	3	0	0	82	1009	10
5	6	6	157	16	21.1	0.159	-9	-9	-999	146	-17.2	0.37	0.38	0.2	1	88	10	300.4	3	0	0	85	1009	10
5	6	6	157	17	11.9	0.14	-9	-9	-999	120	-20.6	0.37	0.38	0.23	0.9	113	10	300.8	3	0	0	82	1010	10
5	6	6	157	18	0.1	0.087	-9	-9	-999	59	-583.8	0.37	0.38	0.36	0.7	87	10	300	3	0	0	79	1011	7
5	6	6	157	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	73	10	299.4	3	0	0	88	1011	7
5	6	6	157	20	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	83	10	299.1	3	0	0	91	1012	7
5	6	6	157	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	83	10	298.9	3	0	0	94	1013	7
5	6	6	157	22	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	298.6	3	0	0	94	1013	7
5	6	6	157	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	77	10	298.4	3	0	0	94	1012	7
5	6	6	157	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	111	10	298.2	3	0	0	88	1011	7
5	6	7	158	1	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	143	10	298	3	0	0	94	1010	7
5	6	7	158	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	135	10	298.1	3	0	0	97	1010	7
5	6	7	158	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	94	1010	7
5	6	7	158	4	-1.8	0.054	-9	-9	-999	29	7.8	0.736	0.77	1	0.7	150	10	297.5	3	0	0	100	1010	7
5	6	7	158	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	46	10	297.4	3	0	0	100	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	7	158	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	299.2	3	0	0	100	1011	7
5	6	7	158	7	28.9	0.164	-9	-9	-999	153	-13.8	0.37	0.38	0.4	1	94	10	301.8	3	0	0	94	1011	0
5	6	7	158	8	44.7	0.137	-9	-9	-999	117	-5.2	0.37	0.38	0.24	0.7	129	10	302.8	3	0	0	80	1012	6
5	6	7	158	9	17.8	0.196	-9	-9	-999	200	-38.2	0.655	0.64	0.19	1.1	341	10	300.5	3	0	2.29	70	1012	10
5	6	7	158	10	2.6	0.132	-9	-9	-999	111	-80.7	0.655	0.64	0.18	0.8	62	10	298.4	3	0	4.83	85	1013	10
5	6	7	158	11	2.4	0.118	-9	-9	-999	94	-62.3	0.655	0.64	0.18	0.7	64	10	297.9	3	0	1.27	94	1013	10
5	6	7	158	12	11.9	0.128	-9	-9	-999	106	-16.1	0.37	0.38	0.18	0.8	93	10	298.4	3	0	0	94	1012	10
5	6	7	158	13	33.6	0.209	-9	-9	-999	219	-24.4	0.655	0.64	0.18	1.1	80	10	298.9	3	0	0.25	94	1011	10
5	6	7	158	14	33.8	0.195	-9	-9	-999	199	-19.9	0.655	0.64	0.18	1	81	10	299.4	3	0	0	97	1010	10
5	6	7	158	15	27.4	0.141	-9	-9	-999	122	-9.1	0.37	0.38	0.19	0.8	106	10	300	3	0	0	94	1009	10
5	6	7	158	16	29.9	0.142	-9	-9	-999	123	-8.6	0.37	0.38	0.2	0.8	104	10	300.9	3	0	0	88	1009	10
5	6	7	158	17	10	0.174	-9	-9	-999	167	-47.3	0.655	0.64	0.22	1	72	10	300.4	3	0	0	85	1009	10
5	6	7	158	18	0.1	0.09	-9	-9	-999	64	-651.8	0.655	0.64	0.35	0.6	76	10	299.1	3	0	0	88	1009	7
5	6	7	158	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	3	0	0	94	1010	7
5	6	7	158	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	84	10	298.5	3	0	0	94	1011	0
5	6	7	158	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	298.4	3	0	0	94	1012	7
5	6	7	158	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	298.4	3	0	0	94	1012	7
5	6	7	158	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	106	10	297.9	3	0	0	94	1012	0
5	6	7	158	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	297.9	3	0	0	94	1012	7
5	6	8	159	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	297.6	3	0	0	94	1011	7
5	6	8	159	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	297.4	3	0	0	97	1010	0
5	6	8	159	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	116	10	297.4	3	0	0	100	1010	7
5	6	8	159	4	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	297.5	3	0	0	100	1010	7
5	6	8	159	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	70	10	297.2	3	0	0	97	1010	0
5	6	8	159	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	298.5	3	0	0	94	1011	7
5	6	8	159	7	19.5	0.147	-9	-9	-999	129	-14.6	0.37	0.38	0.4	0.9	94	10	301.4	3	0	0	94	1012	0
5	6	8	159	8	48.2	0.219	-9	-9	-999	235	-19.6	0.37	0.38	0.24	1.4	125	10	302.6	3	0	0	85	1012	6
5	6	8	159	9	86.8	0.277	-9	-9	-999	334	-22	0.37	0.38	0.2	1.8	134	10	303.4	3	0	0	75	1013	0
5	6	8	159	10	188.1	0.417	-9	-9	-999	620	-34.8	0.736	0.77	0.18	2.2	145	10	303.8	3	0	0	75	1013	5
5	6	8	159	11	128	0.335	-9	-9	-999	450	-26.6	0.736	0.77	0.17	1.7	178	10	302.6	3	0	0	75	1013	9
5	6	8	159	12	32.2	0.242	-9	-9	-999	278	-39.9	0.736	0.77	0.17	1.3	166	10	300.4	3	0	0	75	1012	10
5	6	8	159	13	35.4	0.19	-9	-9	-999	192	-17.6	0.37	0.38	0.18	1.2	130	10	301	3	0	0	94	1012	10
5	6	8	159	14	64.9	0.225	-9	-9	-999	246	-15.8	0.37	0.38	0.18	1.4	126	10	302.6	3	0	0	94	1010	9
5	6	8	159	15	67.8	0.27	-9	-9	-999	323	-26.1	0.37	0.38	0.19	1.8	124	10	303.9	3	0	0	85	1010	9
5	6	8	159	16	20.7	0.202	-9	-9	-999	211	-36.1	0.37	0.38	0.2	1.4	90	10	302.8	3	0	0	75	1010	10
5	6	8	159	17	5.2	0.151	-9	-9	-999	135	-60	0.37	0.38	0.23	1.1	96	10	301.9	3	0	0	68	1010	10
5	6	8	159	18	0.1	0.11	-9	-9	-999	84	-1206.5	0.37	0.38	0.36	0.9	97	10	300.6	3	0	0	79	1010	7
5	6	8	159	19	-0.6	0.03	-9	-9	-999	18	4	0.37	0.38	1	0.5	116	10	299.9	3	0	0	82	1011	7
5	6	8	159	20	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	154	10	299.4	3	0	0	85	1012	7
5	6	8	159	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	3	0	0	82	1012	0
5	6	8	159	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	3	0	0	88	1012	0
5	6	8	159	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	78	10	297.8	3	0	0	94	1012	7
5	6	8	159	24	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	297.6	3	0	0	94	1012	0
5	6	9	160	1	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	104	10	297.4	3	0	0	100	1012	0
5	6	9	160	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	99	10	297.6	3	0	0	93	1012	7
5	6	9	160	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	132	10	297.5	3	0	0	97	1012	3
5	6	9	160	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	92	10	297.4	3	0	0	97	1012	7
5	6	9	160	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	297.2	3	0	0	97	1012	7
5	6	9	160	6	-1.5	0.046	-9	-9	-999	23	6	0.736	0.77	1	0.6	144	10	298.6	3	0	0	94	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	9	160	7	17.9	0.134	-9	-9	-999	113	-12.2	0.37	0.38	0.4	0.8	113	10	302	3	0	0	94	1013	0
5	6	9	160	8	53.1	0.264	-9	-9	-999	312	-31.3	0.37	0.38	0.24	1.8	138	10	302.8	3	0	0	82	1014	0
5	6	9	160	9	88.6	0.277	-9	-9	-999	335	-21.7	0.37	0.38	0.2	1.8	134	10	303.9	3	0	0	80	1014	4
5	6	9	160	10	112.9	0.295	-9	-9	-999	368	-20.5	0.37	0.38	0.19	1.9	122	10	304.9	3	0	0	80	1014	5
5	6	9	160	11	97.3	0.257	-9	-9	-999	301	-15.8	0.37	0.38	0.18	1.6	124	10	305.2	3	0	0	72	1013	8
5	6	9	160	12	109.1	0.283	-9	-9	-999	346	-18.7	0.37	0.38	0.18	1.8	125	10	305.9	3	0	0	62	1013	8
5	6	9	160	13	60.6	0.3	-9	-9	-999	378	-40.2	0.37	0.38	0.18	2.1	124	10	304.4	3	0	1.02	58	1012	9
5	6	9	160	14	61	0.267	-9	-9	-999	318	-28.3	0.37	0.38	0.18	1.8	115	10	302.2	3	0	0.25	66	1011	9
5	6	9	160	15	75.3	0.294	-9	-9	-999	367	-30.5	0.37	0.38	0.19	2	116	10	304.1	3	0	0	66	1010	8
5	6	9	160	16	52.2	0.296	-9	-9	-999	371	-45	0.37	0.38	0.2	2.1	118	10	304	3	0	0	58	1010	9
5	6	9	160	17	23.4	0.303	-9	-9	-999	383	-106.7	0.37	0.38	0.23	2.3	112	10	302.9	3	0	0	65	1011	10
5	6	9	160	18	0.1	0.182	-9	-9	-999	186	-5469.9	0.37	0.38	0.36	1.5	109	10	301.4	3	0	0	70	1011	10
5	6	9	160	19	-3.1	0.067	-9	-9	-999	51	8.7	0.37	0.38	1	1.1	114	10	300.5	3	0	0	79	1012	7
5	6	9	160	20	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	119	10	299.9	3	0	0	88	1013	7
5	6	9	160	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	96	10	299.4	3	0	0	88	1013	7
5	6	9	160	22	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	82	10	299.2	3	0	0	94	1013	7
5	6	9	160	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	102	10	299.2	3	0	0	94	1013	7
5	6	9	160	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	299.1	3	0	0	94	1013	7
5	6	10	161	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298.9	3	0	0	94	1012	7
5	6	10	161	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	298.8	3	0	0	97	1012	7
5	6	10	161	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	298.6	3	0	0	94	1012	7
5	6	10	161	4	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	71	10	298.4	3	0	0	94	1012	7
5	6	10	161	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.2	3	0	0	100	1012	7
5	6	10	161	6	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	136	10	299.5	3	0	0	100	1012	7
5	6	10	161	7	19.9	0.158	-9	-9	-999	145	-18	0.37	0.38	0.4	1	130	10	302.5	3	0	0	88	1012	0
5	6	10	161	8	39.2	0.225	-9	-9	-999	245	-26.2	0.37	0.38	0.24	1.5	136	10	302.9	3	0	0	85	1013	8
5	6	10	161	9	83	0.253	-9	-9	-999	292	-17.6	0.736	0.77	0.19	1.2	155	10	303.8	3	0	0	80	1013	9
5	6	10	161	10	116.6	0.262	-9	-9	-999	309	-14	0.736	0.77	0.18	1.2	176	10	304.4	3	0	0	70	1013	8
5	6	10	161	11	135.9	0.191	-9	-9	-999	194	-4.6	0.736	0.77	0.17	0.7	184	10	305.5	3	0	0	68	1013	8
5	6	10	161	12	49.9	0.19	-9	-9	-999	191	-12.5	0.655	0.64	0.18	0.9	15	10	305.4	2	0	0.51	66	1012	10
5	6	10	161	13	42	0.24	-9	-9	-999	270	-29.7	0.655	0.64	0.18	1.3	359	10	304.2	2	0	0	66	1011	10
5	6	10	161	14	33.3	0.195	-9	-9	-999	199	-20.1	0.655	0.64	0.18	1	2	10	304.9	2	0	8.13	68	1010	10
5	6	10	161	15	12.7	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.17	0	0	10	305.4	2	0	0.76	66	1010	10
5	6	10	161	16	13.5	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.18	0	0	10	300.9	2	0	0	73	1010	10
5	6	10	161	17	5.4	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.21	0	0	10	302	2	0	0	80	1010	10
5	6	10	161	18	0.1	0.09	-9	-9	-999	62	-652.8	0.655	0.64	0.35	0.6	51	10	300.9	2	0	0	91	1011	7
5	6	10	161	19	-1.2	0.042	-9	-9	-999	20	5.6	0.37	0.38	1	0.7	88	10	300.9	2	0	0	85	1012	7
5	6	10	161	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	96	10	300.4	2	0	0	88	1012	0
5	6	10	161	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	300.4	2	0	0	88	1013	7
5	6	10	161	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	93	10	299.2	2	0	0	88	1013	7
5	6	10	161	23	-4.2	0.073	-9	-9	-999	45	8.3	0.37	0.38	1	1.2	116	10	299.2	2	0	0	94	1012	0
5	6	10	161	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	299.2	2	0	0	94	1012	7
5	6	11	162	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	73	10	299.2	2	0	0	94	1011	7
5	6	11	162	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	40	10	298.8	2	0	0	94	1011	0
5	6	11	162	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0	100	1011	7
5	6	11	162	4	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	104	10	298.1	2	0	0	100	1011	7
5	6	11	162	5	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	137	10	298.1	2	0	0	97	1012	7
5	6	11	162	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	47	10	298.1	2	0	0	94	1012	7
5	6	11	162	7	18.1	0.123	-9	-9	-999	99	-9.3	0.37	0.38	0.41	0.7	100	10	300.4	2	0	0	88	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	11	162	8	57.5	0.244	-9	-9	-999	278	-22.9	0.37	0.38	0.24	1.6	131	10	302	2	0	0	80	1012	0
5	6	11	162	9	89.2	0.244	-9	-9	-999	277	-14.7	0.37	0.38	0.2	1.5	121	10	303.1	2	0	0	70	1013	0
5	6	11	162	10	118.2	0.252	-9	-9	-999	291	-12.2	0.37	0.38	0.19	1.5	139	10	305.4	2	0	0	62	1013	5
5	6	11	162	11	109.7	0.261	-9	-9	-999	306	-14.6	0.37	0.38	0.18	1.6	121	10	304.9	2	0	0	64	1012	7
5	6	11	162	12	92.7	0.245	-9	-9	-999	279	-14.3	0.37	0.38	0.18	1.5	116	10	305.9	2	0	1.52	54	1012	8
5	6	11	162	13	48.5	0.132	-9	-9	-999	116	-4.2	0.655	0.64	0.18	0.5	32	10	305.9	2	0	0.76	60	1011	10
5	6	11	162	14	44	0.137	-9	-9	-999	116	-5.2	0.37	0.38	0.18	0.7	92	10	306.4	2	0	0.25	56	1010	10
5	6	11	162	15	39.6	0.123	-9	-9	-999	99	-4.2	0.37	0.38	0.19	0.6	91	10	305.4	2	0	0	58	1010	10
5	6	11	162	16	22.9	0.161	-9	-9	-999	149	-16.6	0.655	0.64	0.19	0.8	22	10	303.1	2	0	0	70	1010	10
5	6	11	162	17	6.4	0.11	-9	-9	-999	84	-18.8	0.37	0.38	0.23	0.7	124	10	304.9	2	0	0	64	1010	10
5	6	11	162	18	0.1	0.122	-9	-9	-999	98	-1644.1	0.37	0.38	0.36	1	125	10	303.1	2	0	0	70	1011	7
5	6	11	162	19	-2.5	0.061	-9	-9	-999	35	7.9	0.37	0.38	1	1	122	10	300.9	2	0	0	85	1012	7
5	6	11	162	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	111	10	300.9	2	0	0	82	1012	0
5	6	11	162	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	300.4	2	0	0	88	1012	7
5	6	11	162	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	76	10	300.4	2	0	0	82	1012	7
5	6	11	162	23	-0.9	0.036	-9	-9	-999	16	4.8	0.37	0.38	1	0.6	94	10	299.9	2	0	0	88	1012	7
5	6	11	162	24	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	106	10	299.2	2	0	0	88	1012	7
5	6	12	163	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	299.2	2	0	0	88	1011	7
5	6	12	163	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	95	10	298.8	2	0	0	94	1011	0
5	6	12	163	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	0	88	1011	7
5	6	12	163	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	298.1	2	0	0	94	1012	7
5	6	12	163	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	106	10	298.1	2	0	0	97	1012	7
5	6	12	163	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	121	10	299.2	2	0	0	88	1013	7
5	6	12	163	7	10.9	0.182	-9	-9	-999	178	-49.6	0.37	0.38	0.41	1.3	126	10	300.9	2	0	0	85	1013	0
5	6	12	163	8	48.9	0.273	-9	-9	-999	329	-37.7	0.37	0.38	0.24	1.9	136	10	302.5	2	0	0	80	1013	4
5	6	12	163	9	92.9	0.3	-9	-9	-999	377	-26.2	0.37	0.38	0.2	2	134	10	303.1	2	0	0	75	1013	0
5	6	12	163	10	190.3	0.418	-9	-9	-999	621	-34.6	0.736	0.77	0.18	2.2	145	10	304.2	2	0	0	70	1013	4
5	6	12	163	11	98.9	0.28	-9	-9	-999	352	-20.1	0.37	0.38	0.19	1.8	139	10	305.9	2	0	0.25	62	1013	8
5	6	12	163	12	114.9	0.339	-9	-9	-999	453	-30.5	0.37	0.38	0.18	2.3	134	10	302	2	0	0.51	80	1012	7
5	6	12	163	13	78.2	0.263	-9	-9	-999	312	-21	0.37	0.38	0.18	1.7	129	10	304.2	2	0	0	66	1011	9
5	6	12	163	14	45.5	0.184	-9	-9	-999	184	-12.4	0.37	0.38	0.18	1.1	116	10	304.2	2	0	1.52	70	1010	10
5	6	12	163	15	42.9	0.159	-9	-9	-999	146	-8.5	0.655	0.64	0.18	0.7	14	10	305.9	2	0	0	60	1010	10
5	6	12	163	16	6.9	0.176	-9	-9	-999	170	-71.2	0.37	0.38	0.2	1.3	116	10	305.4	2	0	0	62	1010	10
5	6	12	163	17	6.8	0.187	-9	-9	-999	186	-85.8	0.37	0.38	0.23	1.4	118	10	303.1	2	0	0	70	1010	10
5	6	12	163	18	0.1	0.17	-9	-9	-999	162	-4450.8	0.37	0.38	0.36	1.4	116	10	302	2	0	0	75	1010	7
5	6	12	163	19	-3.7	0.073	-9	-9	-999	50	9.5	0.37	0.38	1	1.2	118	10	300.9	2	0	0	85	1012	7
5	6	12	163	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	104	10	300.4	2	0	0	88	1012	0
5	6	12	163	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	300.4	2	0	0	88	1013	7
5	6	12	163	22	-1.2	0.042	-9	-9	-999	20	5.6	0.37	0.38	1	0.7	98	10	300.4	2	0	0	88	1013	7
5	6	12	163	23	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	115	10	299.9	2	0	0	88	1012	0
5	6	12	163	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	112	10	299.2	2	0	0	94	1012	7
5	6	13	164	1	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	113	10	299.2	2	0	0	94	1012	7
5	6	13	164	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	112	10	299.2	2	0	0	94	1011	7
5	6	13	164	3	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	88	10	299.2	2	0	0	94	1010	7
5	6	13	164	4	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	152	10	298.9	2	0	0	94	1011	7
5	6	13	164	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	0	94	1011	0
5	6	13	164	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0	94	1012	7
5	6	13	164	7	4.3	0.106	-9	-9	-999	79	-24.9	0.37	0.38	0.41	0.7	112	10	300.4	2	0	0	88	1013	0
5	6	13	164	8	38.2	0.146	-9	-9	-999	129	-7.4	0.37	0.38	0.24	0.8	119	10	300.9	2	0	0	88	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	13	164	9	66.7	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.18	0	0	10	302	2	0	7.37	85	1014	9
5	6	13	164	10	56.1	0.139	-9	-9	-999	119	-4.3	0.736	0.77	0.18	0.5	163	10	300.4	2	0	2.03	88	1013	10
5	6	13	164	11	21.1	0.159	-9	-9	-999	146	-17.2	0.37	0.38	0.19	1	134	10	303.1	2	0	0	75	1013	10
5	6	13	164	12	40.2	0.159	-9	-9	-999	146	-9	0.37	0.38	0.18	0.9	132	10	300.4	2	0	0.25	94	1013	10
5	6	13	164	13	10.9	0.182	-9	-9	-999	178	-49.8	0.37	0.38	0.18	1.3	112	10	299.2	2	0	0	94	1013	10
5	6	13	164	14	4.8	0.171	-9	-9	-999	162	-93.4	0.736	0.77	0.17	1	144	10	298.1	2	0	0.76	94	1012	10
5	6	13	164	15	5.8	0.12	-9	-9	-999	96	-26.6	0.37	0.38	0.19	0.8	136	10	299.2	2	0	0.25	94	1010	10
5	6	13	164	16	10.7	0.16	-9	-9	-999	147	-34.3	0.37	0.38	0.2	1.1	138	10	299.2	2	0	0.25	94	1010	10
5	6	13	164	17	5.4	0.151	-9	-9	-999	135	-58	0.37	0.38	0.23	1.1	110	10	299.2	2	0	0	91	1010	10
5	6	13	164	18	0.1	0.098	-9	-9	-999	71	-856.3	0.37	0.38	0.36	0.8	90	10	299.2	2	0	0	94	1010	7
5	6	13	164	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	54	10	299.2	2	0	0	94	1010	7
5	6	13	164	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	27	10	299.2	2	0	0	94	1010	7
5	6	13	164	21	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	43	10	299.2	2	0	0	94	1011	7
5	6	13	164	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	0	94	1011	7
5	6	13	164	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0	97	1011	7
5	6	13	164	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0	100	1011	7
5	6	14	165	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0	100	1010	7
5	6	14	165	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	75	10	298.1	2	0	0	100	1010	3
5	6	14	165	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	122	10	298.1	2	0	0	100	1010	7
5	6	14	165	4	-2	0.054	-9	-9	-999	29	7	0.736	0.77	1	0.7	144	10	298.1	2	0	0	100	1011	3
5	6	14	165	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	138	10	297.5	2	0	1.78	100	1011	7
5	6	14	165	6	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	114	10	298.1	2	0	0.76	100	1012	3
5	6	14	165	7	6.3	0.121	-9	-9	-999	96	-25	0.37	0.38	0.41	0.8	100	10	299.2	2	0	0	94	1012	6
5	6	14	165	8	23.8	0.103	-9	-9	-999	76	-4.1	0.37	0.38	0.24	0.5	111	10	299.2	2	0	1.27	94	1013	9
5	6	14	165	9	40.6	0.182	-9	-9	-999	178	-13.3	0.37	0.38	0.2	1.1	135	10	300.4	2	0	0.76	94	1013	9
5	6	14	165	10	85.2	0.197	-9	-9	-999	202	-8.2	0.37	0.38	0.19	1.1	116	10	300.9	2	0	0	91	1013	8
5	6	14	165	11	59	0.352	-9	-9	-999	481	-67	0.736	0.77	0.17	2	185	10	301.4	2	0	10.41	85	1013	10
5	6	14	165	12	65.6	0.26	-9	-9	-999	308	-24.1	0.736	0.77	0.17	1.3	156	10	305.4	2	0	0	70	1012	10
5	6	14	165	13	82.5	0.185	-9	-9	-999	185	-7	0.37	0.38	0.18	1	111	10	299.2	2	0	0	94	1011	9
5	6	14	165	14	92.5	0.278	-9	-9	-999	338	-21	0.37	0.38	0.18	1.8	132	10	302.5	2	0	0	80	1010	8
5	6	14	165	15	76.6	0.284	-9	-9	-999	348	-26.9	0.37	0.38	0.19	1.9	126	10	304.2	2	0	0	70	1010	8
5	6	14	165	16	45.6	0.261	-9	-9	-999	307	-35.1	0.37	0.38	0.19	1.8	116	10	303.1	2	0	0	80	1010	9
5	6	14	165	17	12.8	0.206	-9	-9	-999	215	-61.1	0.37	0.38	0.23	1.5	110	10	303.1	2	0	0	72	1010	10
5	6	14	165	18	0.1	0.146	-9	-9	-999	129	-2816.1	0.37	0.38	0.36	1.2	118	10	302	2	0	0	80	1011	7
5	6	14	165	19	-3.7	0.073	-9	-9	-999	47	9.5	0.37	0.38	1	1.2	120	10	300.9	2	0	0	85	1012	7
5	6	14	165	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	299.9	2	0	0	94	1012	7
5	6	14	165	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	300.4	2	0	0	94	1013	7
5	6	14	165	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	300.4	2	0	0	88	1013	7
5	6	14	165	23	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	64	10	299.2	2	0	0	94	1013	7
5	6	14	165	24	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	38	10	299.2	2	0	0	94	1013	7
5	6	15	166	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	42	10	299.2	2	0	0	94	1013	7
5	6	15	166	2	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	63	10	999	2	0	0	999	1012	7
5	6	15	166	3	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	94	10	999	2	0	0	999	1012	99
5	6	15	166	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.2	104	10	999	2	0	0	999	1012	99
5	6	15	166	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	92	10	999	2	0	0	999	1013	99
5	6	15	166	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.1	94	10	999	2	0	0	999	1013	99
5	6	15	166	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.41	1.3	99	10	999	2	0	0	999	1013	0
5	6	15	166	8	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.24	2	129	10	999	2	0	0	999	1013	0
5	6	15	166	9	-999	-9	-9	-9	-999	-999	-99999	0.736	0.77	0.19	2.2	140	10	999	2	0	0	999	1014	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	15	166	10	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	2.5	137	10	999	2	0	0	999	1013	6
5	6	15	166	11	162.4	0.412	-9	-9	-999	607	-38.8	0.736	0.77	0.17	2.2	157	10	303.1	2	0	0	75	1013	8
5	6	15	166	12	165.3	0.386	-9	-9	-999	551	-31.3	0.736	0.77	0.17	2	155	10	304.2	2	0	0	66	1013	8
5	6	15	166	13	187.4	0.417	-9	-9	-999	619	-34.9	0.736	0.77	0.17	2.2	144	10	304.2	2	0	0	70	1012	7
5	6	15	166	14	62.3	0.301	-9	-9	-999	387	-39.4	0.37	0.38	0.18	2.1	133	10	305.4	2	0	0	64	1011	9
5	6	15	166	15	48.4	0.251	-9	-9	-999	290	-29.5	0.37	0.38	0.19	1.7	129	10	305.4	2	0	0	62	1011	10
5	6	15	166	16	35.5	0.245	-9	-9	-999	279	-37.3	0.37	0.38	0.19	1.7	116	10	305.4	2	0	0	62	1011	10
5	6	15	166	17	7.8	0.21	-9	-9	-999	222	-107.5	0.37	0.38	0.23	1.6	112	10	302.5	2	0	0	77	1011	10
5	6	15	166	18	0.1	0.17	-9	-9	-999	162	-4453.7	0.37	0.38	0.35	1.4	95	10	303.1	2	0	0	70	1011	7
5	6	15	166	19	-3.5	0.067	-9	-9	-999	46	7.8	0.37	0.38	1	1.1	98	10	300.9	2	0	0	85	1012	3
5	6	15	166	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	89	10	300.9	2	0	0	85	1013	0
5	6	15	166	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	91	10	300.4	2	0	0	88	1013	3
5	6	15	166	22	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	65	10	300.4	2	0	0	88	1014	3
5	6	15	166	23	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	76	10	299.2	2	0	0	91	1014	0
5	6	15	166	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	299.2	2	0	0	88	1014	7
5	6	16	167	1	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	299.2	2	0	0	88	1013	7
5	6	16	167	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	299.2	2	0	0	88	1013	7
5	6	16	167	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	299.2	2	0	0	94	1013	7
5	6	16	167	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	299.2	2	0	0	94	1013	7
5	6	16	167	5	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	95	10	298.8	2	0	0	97	1013	0
5	6	16	167	6	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	115	10	299.2	2	0	0.25	94	1014	3
5	6	16	167	7	2	0.165	-9	-9	-999	155	-207.2	0.37	0.38	0.41	1.3	132	10	299.2	2	0	0	94	1015	0
5	6	16	167	8	85.9	0.254	-9	-9	-999	294	-17.2	0.736	0.77	0.23	1.2	153	10	300.9	2	0	0	82	1015	0
5	6	16	167	9	87.9	0.162	-9	-9	-999	153	-4.4	0.37	0.38	0.2	0.8	111	10	303.1	2	0	0	75	1015	0
5	6	16	167	10	115.2	0.251	-9	-9	-999	289	-12.4	0.37	0.38	0.19	1.5	127	10	304.2	2	0	0	70	1015	5
5	6	16	167	11	201.9	0.351	-9	-9	-999	479	-19.4	0.736	0.77	0.17	1.7	142	10	305.4	2	0	0	66	1014	6
5	6	16	167	12	186.5	0.335	-9	-9	-999	446	-18.2	0.736	0.77	0.17	1.6	159	10	305.9	2	0	0	64	1013	7
5	6	16	167	13	168.5	0.274	-9	-9	-999	332	-11.1	0.736	0.77	0.17	1.2	143	10	305.9	2	0	0	62	1013	8
5	6	16	167	14	46.9	0.147	-9	-9	-999	137	-6	0.655	0.64	0.18	0.6	66	10	306.4	2	0	0	60	1012	10
5	6	16	167	15	19.4	0.158	-9	-9	-999	145	-18.4	0.655	0.64	0.18	0.8	73	10	305.9	2	0	0	60	1012	10
5	6	16	167	16	10.6	0.214	-9	-9	-999	228	-83.2	0.37	0.38	0.19	1.6	94	10	305.4	2	0	0	66	1012	10
5	6	16	167	17	4.9	0.228	-9	-9	-999	251	-218	0.37	0.38	0.23	1.8	105	10	304.2	2	0	0	70	1012	10
5	6	16	167	18	0.1	0.158	-9	-9	-999	146	-3577.5	0.37	0.38	0.35	1.3	106	10	302	2	0	0	85	1013	3
5	6	16	167	19	-2.9	0.061	-9	-9	-999	40	7.1	0.37	0.38	1	1	111	10	300.9	2	0	0	85	1013	3
5	6	16	167	20	-2.9	0.061	-9	-9	-999	34	7.1	0.37	0.38	1	1	106	10	300.9	2	0	0	88	1013	3
5	6	16	167	21	-3.5	0.067	-9	-9	-999	40	7.8	0.37	0.38	1	1.1	106	10	300.9	2	0	0	91	1014	3
5	6	16	167	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	99	10	300.9	2	0	0	85	1014	3
5	6	16	167	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	92	10	300.4	2	0	0	88	1014	0
5	6	16	167	24	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	138	10	300.4	2	0	0	88	1013	3
5	6	17	168	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	0	94	1013	3
5	6	17	168	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	0	94	1013	0
5	6	17	168	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	298.1	2	0	0	100	1013	3
5	6	17	168	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	298.1	2	0	0	100	1013	3
5	6	17	168	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	298.8	2	0	0	94	1013	3
5	6	17	168	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	298.1	2	0	0	100	1014	7
5	6	17	168	7	11.9	0.172	-9	-9	-999	164	-38.7	0.37	0.38	0.41	1.2	123	10	299.2	2	0	0	94	1014	0
5	6	17	168	8	44.2	0.238	-9	-9	-999	267	-27.7	0.37	0.38	0.24	1.6	138	10	302	2	0	0	82	1015	6
5	6	17	168	9	83.8	0.231	-9	-9	-999	256	-13.3	0.37	0.38	0.2	1.4	126	10	304.2	2	0	0	70	1015	5
5	6	17	168	10	89.5	0.277	-9	-9	-999	336	-21.5	0.37	0.38	0.19	1.8	130	10	305.4	2	0	0	66	1015	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	17	168	11	112.4	0.25	-9	-9	-999	288	-12.6	0.37	0.38	0.19	1.5	129	10	305.4	2	0	0	66	1014	7
5	6	17	168	12	59.8	0.224	-9	-9	-999	243	-16.9	0.37	0.38	0.18	1.4	115	10	305.4	2	0	0	62	1013	10
5	6	17	168	13	121.6	0.263	-9	-9	-999	311	-13.6	0.37	0.38	0.18	1.6	116	10	305.9	2	0	0	60	1012	7
5	6	17	168	14	91.4	0.233	-9	-9	-999	259	-12.5	0.37	0.38	0.18	1.4	107	10	305.9	2	0	0	60	1012	8
5	6	17	168	15	36.1	0.234	-9	-9	-999	261	-32.1	0.37	0.38	0.19	1.6	106	10	305.9	2	0	0	60	1011	10
5	6	17	168	16	46.6	0.272	-9	-9	-999	327	-39.1	0.37	0.38	0.19	1.9	113	10	305.4	2	0	0	62	1011	9
5	6	17	168	17	16.9	0.253	-9	-9	-999	293	-86.9	0.37	0.38	0.23	1.9	117	10	304.2	2	0	0	66	1011	10
5	6	17	168	18	0.1	0.182	-9	-9	-999	180	-5473.5	0.37	0.38	0.35	1.5	108	10	303.1	2	0	0	70	1012	3
5	6	17	168	19	-5.6	0.085	-9	-9	-999	61	9.9	0.37	0.38	1	1.4	106	10	302	2	0	0	80	1013	3
5	6	17	168	20	-4.8	0.079	-9	-9	-999	51	9.2	0.37	0.38	1	1.3	111	10	300.9	2	0	0	82	1013	3
5	6	17	168	21	-7.3	0.097	-9	-9	-999	70	11.3	0.37	0.38	1	1.6	106	10	300.4	2	0	0	88	1014	3
5	6	17	168	22	-4.8	0.079	-9	-9	-999	51	9.2	0.37	0.38	1	1.3	111	10	300.4	2	0	0	88	1014	3
5	6	17	168	23	-3.5	0.067	-9	-9	-999	40	7.8	0.37	0.38	1	1.1	104	10	300.4	2	0	0	88	1014	3
5	6	17	168	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	300.4	2	0	0	88	1013	3
5	6	18	169	1	-2.9	0.061	-9	-9	-999	34	7.1	0.37	0.38	1	1	111	10	300.4	2	0	0	88	1013	3
5	6	18	169	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	299.2	2	0	0	94	1013	7
5	6	18	169	3	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	57	10	299.2	2	0	0	94	1013	3
5	6	18	169	4	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	78	10	299.2	2	0	0	94	1013	3
5	6	18	169	5	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	78	10	299.2	2	0	0	94	1013	3
5	6	18	169	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	299.2	2	0	0	94	1014	3
5	6	18	169	7	15.9	0.155	-9	-9	-999	140	-21	0.37	0.38	0.41	1	103	10	300.4	2	0	0	88	1014	0
5	6	18	169	8	30.7	0.242	-9	-9	-999	274	-41.8	0.37	0.38	0.24	1.7	120	10	302	2	0	0.76	85	1015	9
5	6	18	169	9	76.2	0.251	-9	-9	-999	290	-18.8	0.37	0.38	0.2	1.6	116	10	300.4	2	0	0.25	88	1015	6
5	6	18	169	10	94.3	0.29	-9	-9	-999	358	-23.3	0.37	0.38	0.19	1.9	115	10	302	2	0	0	85	1014	7
5	6	18	169	11	118.7	0.373	-9	-9	-999	524	-39.6	0.736	0.77	0.17	2	144	10	303.8	2	0	1.02	77	1014	9
5	6	18	169	12	130.9	0.299	-9	-9	-999	379	-18.5	0.37	0.38	0.18	1.9	132	10	304.2	2	0	0	70	1013	7
5	6	18	169	13	42.2	0.259	-9	-9	-999	304	-37.3	0.37	0.38	0.18	1.8	123	10	305.4	2	0	0	62	1012	10
5	6	18	169	14	75.9	0.284	-9	-9	-999	347	-27.1	0.37	0.38	0.18	1.9	111	10	304.9	2	0	0	64	1012	9
5	6	18	169	15	72.9	0.272	-9	-9	-999	326	-24.8	0.37	0.38	0.19	1.8	88	10	304.2	2	0	0	66	1011	9
5	6	18	169	16	40.4	0.28	-9	-9	-999	341	-48.9	0.37	0.38	0.19	2	89	10	299.2	2	0	0	88	1011	9
5	6	18	169	17	12	0.205	-9	-9	-999	215	-64.5	0.37	0.38	0.23	1.5	93	10	300.9	2	0	0	91	1012	10
5	6	18	169	18	0.1	0.146	-9	-9	-999	129	-2817.9	0.37	0.38	0.35	1.2	91	10	300.9	2	0	0	91	1012	10
5	6	18	169	19	-2.9	0.061	-9	-9	-999	38	7.1	0.37	0.38	1	1	100	10	300.4	2	0	0	88	1012	3
5	6	18	169	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	299.2	2	0	0	94	1013	7
5	6	18	169	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	89	10	299.2	2	0	0.51	94	1014	7
5	6	18	169	22	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	84	10	299.2	2	0	0	94	1014	7
5	6	18	169	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	299.2	2	0	0	94	1013	7
5	6	18	169	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	61	10	299.2	2	0	0	94	1013	7
5	6	19	170	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	59	10	299.2	2	0	0	94	1012	3
5	6	19	170	2	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	39	10	299.2	2	0	0	94	1012	3
5	6	19	170	3	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	56	10	299.2	2	0	0	94	1012	3
5	6	19	170	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	299.2	2	0	0	94	1012	7
5	6	19	170	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	69	10	299.2	2	0	0	94	1012	7
5	6	19	170	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	43	10	299.2	2	0	0	94	1013	7
5	6	19	170	7	8.7	0.198	-9	-9	-999	202	-80.3	0.655	0.64	0.41	1.2	57	10	298.8	2	0	1.78	94	1014	8
5	6	19	170	8	25.5	0.347	-9	-9	-999	471	-148.5	0.655	0.64	0.23	2.2	82	10	298.1	2	0	1.52	94	1014	10
5	6	19	170	9	6.6	0.209	-9	-9	-999	230	-125	0.37	0.38	0.2	1.6	110	10	298.1	2	0	2.54	94	1014	10
5	6	19	170	10	21.7	0.181	-9	-9	-999	178	-24.7	0.37	0.38	0.19	1.2	111	10	298.1	2	0	0	94	1014	10
5	6	19	170	11	49.5	0.23	-9	-9	-999	254	-22.3	0.655	0.64	0.18	1.2	81	10	298.1	2	0	0	100	1013	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	19	170	12	33.3	0.211	-9	-9	-999	223	-25.4	0.37	0.38	0.18	1.4	106	10	302	2	0	0	85	1013	10
5	6	19	170	13	23.7	0.204	-9	-9	-999	213	-32.6	0.37	0.38	0.18	1.4	113	10	303.1	2	0	0	75	1012	10
5	6	19	170	14	20.9	0.191	-9	-9	-999	193	-30.3	0.37	0.38	0.18	1.3	104	10	302.5	2	0	0	77	1011	10
5	6	19	170	15	18.2	0.2	-9	-9	-999	206	-39.8	0.37	0.38	0.19	1.4	101	10	302	2	0	0	80	1010	10
5	6	19	170	16	13	0.195	-9	-9	-999	198	-51.5	0.37	0.38	0.19	1.4	104	10	302	2	0	0	85	1010	10
5	6	19	170	17	3.8	0.193	-9	-9	-999	194	-168.5	0.37	0.38	0.23	1.5	102	10	301.4	2	0	0	85	1010	10
5	6	19	170	18	0.1	0.134	-9	-9	-999	114	-2176.8	0.37	0.38	0.35	1.1	107	10	300.9	2	0	0	85	1011	10
5	6	19	170	19	-2.1	0.061	-9	-9	-999	36	9.8	0.37	0.38	1	1	127	10	300.9	2	0	0	85	1012	10
5	6	19	170	20	-4.1	0.085	-9	-9	-999	57	13.6	0.37	0.38	1	1.4	121	10	299.9	2	0	0	91	1012	10
5	6	19	170	21	-1.7	0.055	-9	-9	-999	29	8.8	0.37	0.38	1	0.9	104	10	299.2	2	0	0	94	1012	10
5	6	19	170	22	-1.3	0.049	-9	-9	-999	25	7.8	0.37	0.38	1	0.8	108	10	299.2	2	0	0	94	1012	10
5	6	19	170	23	-1.3	0.049	-9	-9	-999	25	7.8	0.37	0.38	1	0.8	104	10	299.2	2	0	0	97	1011	10
5	6	19	170	24	-0.7	0.037	-9	-9	-999	16	6.5	0.655	0.64	1	0.5	52	10	299.2	2	0	0	94	1011	10
5	6	20	171	1	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	47	10	299.2	2	0	0	94	1010	7
5	6	20	171	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	21	10	299.2	2	0	0	94	1010	7
5	6	20	171	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	26	10	299.2	2	0	0	94	1010	7
5	6	20	171	4	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	62	10	299.2	2	0	0	94	1010	7
5	6	20	171	5	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	299.2	2	0	0	94	1011	7
5	6	20	171	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	299.2	2	0	0	94	1012	7
5	6	20	171	7	13.1	0.162	-9	-9	-999	151	-29.6	0.37	0.38	0.41	1.1	104	10	300.4	2	0	0	88	1012	0
5	6	20	171	8	54.9	0.254	-9	-9	-999	294	-26.9	0.37	0.38	0.24	1.7	116	10	302	2	0	0	85	1013	0
5	6	20	171	9	75.7	0.24	-9	-9	-999	270	-16.5	0.37	0.38	0.2	1.5	96	10	302	2	0	0	85	1013	7
5	6	20	171	10	115.1	0.317	-9	-9	-999	410	-24.9	0.37	0.38	0.19	2.1	112	10	304.2	2	0	0	70	1013	5
5	6	20	171	11	88.7	0.323	-9	-9	-999	423	-34.4	0.736	0.77	0.17	1.7	151	10	300.9	2	0	0.25	85	1013	9
5	6	20	171	12	89.6	0.212	-9	-9	-999	230	-9.6	0.736	0.77	0.17	0.9	153	10	302	2	0	0	85	1012	10
5	6	20	171	13	61.9	0.195	-9	-9	-999	198	-10.8	0.655	0.64	0.18	0.9	58	10	304.2	2	0	0	70	1012	10
5	6	20	171	14	33	0.208	-9	-9	-999	219	-24.8	0.655	0.64	0.18	1.1	71	10	297.5	2	0	0.51	97	1012	10
5	6	20	171	15	6.1	0.193	-9	-9	-999	196	-107.5	0.655	0.64	0.18	1.2	84	10	298.1	2	0	0	94	1011	10
5	6	20	171	16	11.4	0.176	-9	-9	-999	169	-43.1	0.655	0.64	0.19	1	72	10	298.1	2	0	0.25	94	1011	10
5	6	20	171	17	7.8	0.171	-9	-9	-999	162	-57.2	0.655	0.64	0.22	1	78	10	299.2	2	0	0	94	1011	10
5	6	20	171	18	0.1	0.118	-9	-9	-999	94	-1498.9	0.655	0.64	0.34	0.8	76	10	299.2	2	0	0	94	1012	7
5	6	20	171	19	-1.6	0.049	-9	-9	-999	26	6.3	0.37	0.38	1	0.8	129	10	298.1	2	0	0	100	1012	7
5	6	20	171	20	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	113	10	298.1	2	0	0	97	1013	7
5	6	20	171	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	298.1	2	0	0	100	1013	7
5	6	20	171	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	41	10	298.1	2	0	0	100	1013	7
5	6	20	171	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	298.1	2	0	0	100	1013	7
5	6	20	171	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298.1	2	0	0	94	1013	7
5	6	21	172	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	297	2	0	0	100	1013	7
5	6	21	172	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	75	10	297.5	2	0	0	97	1012	7
5	6	21	172	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	297	2	0	0	100	1012	7
5	6	21	172	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	298.1	2	0	0	94	1013	7
5	6	21	172	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	297.5	2	0	0	97	1013	7
5	6	21	172	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	298.1	2	0	0	94	1013	7
5	6	21	172	7	25.6	0.149	-9	-9	-999	133	-11.8	0.655	0.64	0.41	0.7	84	10	300.4	2	0	0	88	1014	0
5	6	21	172	8	58.4	0.211	-9	-9	-999	224	-14.7	0.37	0.38	0.24	1.3	117	10	302	2	0	0	82	1015	0
5	6	21	172	9	135.5	0.391	-9	-9	-999	563	-40	0.736	0.77	0.19	2.1	141	10	303.1	2	0	0	80	1015	5
5	6	21	172	10	113.9	0.349	-9	-9	-999	475	-33.8	0.37	0.38	0.19	2.4	135	10	304.2	2	0	0	70	1015	5
5	6	21	172	11	199.2	0.447	-9	-9	-999	686	-40.4	0.736	0.77	0.17	2.4	140	10	304.2	2	0	0	66	1014	6
5	6	21	172	12	131.3	0.364	-9	-9	-999	510	-33.3	0.37	0.38	0.18	2.5	137	10	305.4	2	0	0	62	1014	6

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	21	172	13	140	0.406	-9	-9	-999	595	-43.2	0.736	0.77	0.17	2.2	140	10	305.4	2	0	0	62	1013	9
5	6	21	172	14	85.9	0.331	-9	-9	-999	440	-38	0.37	0.38	0.18	2.3	122	10	304.9	2	0	0	70	1013	9
5	6	21	172	15	67.1	0.303	-9	-9	-999	383	-37.2	0.37	0.38	0.19	2.1	130	10	305.4	2	0	0	62	1012	9
5	6	21	172	16	43.6	0.292	-9	-9	-999	364	-51.7	0.37	0.38	0.19	2.1	121	10	304.2	2	0	0	66	1012	9
5	6	21	172	17	11.9	0.271	-9	-9	-999	325	-151	0.37	0.38	0.23	2.1	114	10	303.8	2	0	0	70	1013	10
5	6	21	172	18	0.1	0.219	-9	-9	-999	236	-8888	0.37	0.38	0.35	1.8	114	10	302	2	0	0	80	1013	3
5	6	21	172	19	-4.1	0.073	-9	-9	-999	66	8.5	0.37	0.38	1	1.2	110	10	300.9	2	0	0	85	1014	3
5	6	21	172	20	-3.5	0.067	-9	-9	-999	40	7.6	0.37	0.38	1	1.1	101	10	300.4	2	0	0	85	1014	0
5	6	21	172	21	-4.1	0.073	-9	-9	-999	45	8.5	0.37	0.38	1	1.2	107	10	300.4	2	0	0	88	1015	3
5	6	21	172	22	-3.5	0.067	-9	-9	-999	40	7.8	0.37	0.38	1	1.1	110	10	300.4	2	0	0	88	1015	3
5	6	21	172	23	-3.5	0.067	-9	-9	-999	40	7.8	0.37	0.38	1	1.1	111	10	299.9	2	0	0	91	1015	3
5	6	21	172	24	-4.8	0.079	-9	-9	-999	51	9.1	0.37	0.38	1	1.3	98	10	299.2	2	0	0	88	1014	3
5	6	22	173	1	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	84	10	299.2	2	0	0	88	1014	3
5	6	22	173	2	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	77	10	298.8	2	0	0	91	1013	0
5	6	22	173	3	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	102	10	298.1	2	0	0	94	1013	3
5	6	22	173	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	298.1	2	0	0	94	1013	3
5	6	22	173	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	298.1	2	0	0	94	1013	7
5	6	22	173	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	298.1	2	0	0	94	1014	3
5	6	22	173	7	3.1	0.146	-9	-9	-999	128	-92.2	0.37	0.38	0.42	1.1	104	10	300.4	2	0	0	88	1014	0
5	6	22	173	8	16.8	0.188	-9	-9	-999	188	-35.9	0.37	0.38	0.24	1.3	96	10	302	2	0	0	77	1015	10
5	6	22	173	9	82.6	0.23	-9	-9	-999	254	-13.3	0.655	0.64	0.19	1.1	85	10	299.2	2	0	0	88	1015	8
5	6	22	173	10	54.8	0.199	-9	-9	-999	204	-13	0.37	0.38	0.19	1.2	103	10	303.1	2	0	0	70	1015	9
5	6	22	173	11	38.3	0.109	-9	-9	-999	85	-3.1	0.37	0.38	0.19	0.5	129	10	302	2	0	0.25	75	1014	10
5	6	22	173	12	78.1	0.241	-9	-9	-999	271	-16.1	0.37	0.38	0.18	1.5	127	10	300.9	2	0	0	85	1014	9
5	6	22	173	13	42.7	0.227	-9	-9	-999	248	-24.6	0.37	0.38	0.18	1.5	98	10	300.4	2	0	0	88	1014	10
5	6	22	173	14	12.4	0.205	-9	-9	-999	214	-63	0.37	0.38	0.18	1.5	99	10	299.9	2	0	0	88	1013	10
5	6	22	173	15	8	0.134	-9	-9	-999	114	-27.4	0.37	0.38	0.19	0.9	100	10	298.1	2	0	0	94	1012	10
5	6	22	173	16	1.6	0.119	-9	-9	-999	95	-93.5	0.37	0.38	0.19	0.9	86	10	298.1	2	0	0.25	100	1011	10
5	6	22	173	17	0.1	0.158	-9	-9	-999	145	-3576.3	0.37	0.38	0.23	1.3	91	10	298.8	2	0	0	94	1012	10
5	6	22	173	18	0.1	0.134	-9	-9	-999	113	-2181.1	0.37	0.38	0.35	1.1	97	10	299.2	2	0	0	88	1013	7
5	6	22	173	19	-2.2	0.059	-9	-9	-999	35	8.4	0.655	0.64	1	0.8	53	10	298.1	2	0	0	94	1014	7
5	6	22	173	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	298.1	2	0	0	94	1014	7
5	6	22	173	21	-3.6	0.077	-9	-9	-999	49	11.2	0.736	0.77	1	1	153	10	298.1	2	0	0	88	1015	7
5	6	22	173	22	-5.2	0.092	-9	-9	-999	64	13.5	0.736	0.77	1	1.2	149	10	298.1	2	0	0	94	1015	7
5	6	22	173	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0.25	97	1015	7
5	6	22	173	24	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	96	10	298.1	2	0	0	94	1014	3
5	6	23	174	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	298.1	2	0	0	94	1014	7
5	6	23	174	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	298.1	2	0	0	97	1014	7
5	6	23	174	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	298.1	2	0	0	94	1014	7
5	6	23	174	4	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	84	10	298.1	2	0	0	94	1014	7
5	6	23	174	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	0	97	1014	7
5	6	23	174	6	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	130	10	297	2	0	0	94	1015	7
5	6	23	174	7	17.8	0.144	-9	-9	-999	125	-15.1	0.655	0.64	0.41	0.7	80	10	298.1	2	0	0	88	1015	0
5	6	23	174	8	42.5	0.182	-9	-9	-999	179	-12.9	0.37	0.38	0.24	1.1	101	10	300.9	2	0	0	82	1015	6
5	6	23	174	9	64.9	0.302	-9	-9	-999	381	-38.3	0.37	0.38	0.2	2.1	111	10	299.5	2	0	0	85	1016	8
5	6	23	174	10	61.8	0.311	-9	-9	-999	399	-44.2	0.37	0.38	0.19	2.2	118	10	298.1	2	0	0	88	1016	9
5	6	23	174	11	52	0.275	-9	-9	-999	332	-36.1	0.37	0.38	0.19	1.9	112	10	298.1	2	0	0	88	1016	10
5	6	23	174	12	118.3	0.339	-9	-9	-999	455	-29.9	0.37	0.38	0.18	2.3	119	10	300.9	2	0	0	79	1015	7
5	6	23	174	13	91.1	0.332	-9	-9	-999	440	-36.4	0.37	0.38	0.18	2.3	124	10	302	2	0	0	75	1014	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	23	174	14	96.7	0.356	-9	-9	-999	487	-42	0.37	0.38	0.18	2.5	110	10	303.8	2	0	0	68	1013	8
5	6	23	174	15	76.2	0.349	-9	-9	-999	474	-50.4	0.37	0.38	0.19	2.5	118	10	303.1	2	0	0	70	1013	8
5	6	23	174	16	47.7	0.305	-9	-9	-999	389	-53.8	0.37	0.38	0.19	2.2	111	10	302	2	0	0	73	1013	9
5	6	23	174	17	15.6	0.252	-9	-9	-999	292	-93	0.37	0.38	0.23	1.9	110	10	300.9	2	0	0	77	1013	10
5	6	23	174	18	0.1	0.158	-9	-9	-999	148	-3577.5	0.37	0.38	0.35	1.3	113	10	300.9	2	0	0	79	1013	3
5	6	23	174	19	-2.5	0.061	-9	-9	-999	40	7.9	0.37	0.38	1	1	109	10	300.4	2	0	0	82	1013	7
5	6	23	174	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	114	10	299.9	2	0	0	88	1014	7
5	6	23	174	21	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	114	10	299.2	2	0	0	94	1015	3
5	6	23	174	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	102	10	299.2	2	0	0	94	1015	3
5	6	23	174	23	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	109	10	299.2	2	0	0	94	1015	7
5	6	23	174	24	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	112	10	299.2	2	0	0	94	1015	7
5	6	24	175	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	104	10	299.2	2	0	0.25	94	1014	7
5	6	24	175	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	122	10	298.8	2	0	0	97	1014	7
5	6	24	175	3	-4.4	0.084	-9	-9	-999	56	12.4	0.736	0.77	1	1.1	157	10	299.2	2	0	1.02	94	1014	7
5	6	24	175	4	-4.4	0.084	-9	-9	-999	56	12.4	0.736	0.77	1	1.1	176	10	299.2	2	0	0.25	94	1015	7
5	6	24	175	5	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	150	10	298.8	2	0	0	94	1014	7
5	6	24	175	6	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	152	10	298.1	2	0	0	100	1015	7
5	6	24	175	7	17.8	0.134	-9	-9	-999	113	-12.3	0.37	0.38	0.42	0.8	95	10	299.2	2	0	0	94	1015	0
5	6	24	175	8	58.3	0.245	-9	-9	-999	278	-22.7	0.37	0.38	0.24	1.6	116	10	302	2	0	0	82	1016	0
5	6	24	175	9	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.2	1.5	110	10	999	2	0	0	999	1015	5
5	6	24	175	10	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	1.8	116	10	999	2	0	0	999	1015	4
5	6	24	175	11	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	1.7	104	10	999	2	0	0	999	1015	7
5	6	24	175	12	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.18	1.8	113	10	999	2	0	0	999	1015	6
5	6	24	175	13	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.18	2	110	10	999	2	0	0	999	1014	8
5	6	24	175	14	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.18	2.3	110	10	999	2	0	0	999	1014	8
5	6	24	175	15	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	2.1	110	10	999	2	0	0	999	1013	8
5	6	24	175	16	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	2	98	10	999	2	0	0	999	1013	9
5	6	24	175	17	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.23	1.9	95	10	999	2	0	0	999	1013	10
5	6	24	175	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.35	1.4	107	10	999	2	0	0	999	1013	99
5	6	24	175	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.3	101	10	999	2	0	0	999	1014	99
5	6	24	175	20	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	114	10	999	2	0	0	999	1014	99
5	6	24	175	21	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	101	10	999	2	0	0	999	1015	99
5	6	24	175	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	86	10	999	2	0	0	999	1015	99
5	6	24	175	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	72	10	999	2	0	0	999	1015	99
5	6	24	175	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	86	10	999	2	0	0	999	1014	99
5	6	25	176	1	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.5	86	10	999	2	0	0	999	1014	99
5	6	25	176	2	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	105	10	999	2	0	0	999	1014	99
5	6	25	176	3	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	93	10	999	2	0	0	999	1014	99
5	6	25	176	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	96	10	999	2	0	0	999	1014	99
5	6	25	176	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1.2	139	10	999	2	0	6.86	999	1014	99
5	6	25	176	6	-999	-9	-9	-9	-999	-999	-99999	0.736	0.77	1	0.7	142	10	999	2	0	0	999	1014	99
5	6	25	176	7	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.42	1	110	10	999	2	0	0	999	1014	0
5	6	25	176	8	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.24	1.4	112	10	999	2	0	0	999	1015	6
5	6	25	176	9	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.2	1.4	115	10	999	2	0	0	999	1015	5
5	6	25	176	10	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	2	119	10	999	2	0	0	999	1015	6
5	6	25	176	11	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	1.6	89	10	999	2	0	1.02	999	1014	9
5	6	25	176	12	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.18	1.9	101	10	999	2	0	0	999	1014	7
5	6	25	176	13	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.18	1.8	108	10	999	2	0	0	999	1013	9
5	6	25	176	14	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.18	2	97	10	999	2	0	0	999	1012	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	25	176	15	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	2.2	99	10	999	2	0	0	999	1012	8
5	6	25	176	16	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	2	106	10	999	2	0	0	999	1012	9
5	6	25	176	17	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.23	1.6	93	10	999	2	0	0	999	1012	10
5	6	25	176	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.35	1.4	104	10	999	2	0	0	999	1012	10
5	6	25	176	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	102	10	999	2	0	0	999	1012	99
5	6	25	176	20	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.9	98	10	999	2	0	0	999	1013	99
5	6	25	176	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	78	10	999	2	0	0	999	1014	99
5	6	25	176	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	79	10	999	2	0	0	999	1014	99
5	6	25	176	23	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	94	10	999	2	0	0	999	1014	99
5	6	25	176	24	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	102	10	999	2	0	0	999	1013	99
5	6	26	177	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	77	10	999	2	0	0	999	1013	99
5	6	26	177	2	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.9	80	10	999	2	0	0	999	1013	99
5	6	26	177	3	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.8	66	10	999	2	0	0	999	1013	99
5	6	26	177	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	87	10	999	2	0	0	999	1013	99
5	6	26	177	5	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	93	10	999	2	0	0	999	1013	99
5	6	26	177	6	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	101	10	999	2	0	0	999	1014	99
5	6	26	177	7	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	0.41	1.1	84	10	999	2	0	0	999	1014	0
5	6	26	177	8	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.24	1.4	87	10	999	2	0	0	999	1014	0
5	6	26	177	9	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.2	1.5	90	10	999	2	0	0	999	1014	5
5	6	26	177	10	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	1.7	108	10	999	2	0	0	999	1014	8
5	6	26	177	11	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.19	1.8	112	10	999	2	0	0	999	1014	6
5	6	26	177	12	132.6	0.288	-9	-9	-999	356	-16.3	0.37	0.38	0.18	1.8	109	10	305.4	2	0	0	58	1014	6
5	6	26	177	13	122.6	0.286	-9	-9	-999	352	-17.3	0.37	0.38	0.18	1.8	109	10	305.4	2	0	0	58	1013	7
5	6	26	177	14	107.7	0.304	-9	-9	-999	385	-23.5	0.37	0.38	0.18	2	98	10	305.9	2	0	0	56	1012	8
5	6	26	177	15	75.9	0.305	-9	-9	-999	388	-33.8	0.37	0.38	0.19	2.1	109	10	305.4	2	0	0	62	1012	9
5	6	26	177	16	49.1	0.284	-9	-9	-999	349	-42.2	0.37	0.38	0.19	2	106	10	305.4	2	0	0	58	1012	9
5	6	26	177	17	18.1	0.232	-9	-9	-999	259	-62.6	0.37	0.38	0.22	1.7	88	10	304.2	2	0	0	63	1012	10
5	6	26	177	18	0.1	0.17	-9	-9	-999	162	-4456.7	0.37	0.38	0.35	1.4	92	10	302	2	0	0	75	1012	10
5	6	26	177	19	-4.8	0.079	-9	-9	-999	54	9.2	0.37	0.38	1	1.3	89	10	300.9	2	0	0	79	1012	3
5	6	26	177	20	-5.7	0.085	-9	-9	-999	57	9.6	0.37	0.38	1	1.4	90	10	300.4	2	0	0	85	1013	0
5	6	26	177	21	-3.5	0.067	-9	-9	-999	40	7.8	0.37	0.38	1	1.1	88	10	300.4	2	0	0	82	1014	3
5	6	26	177	22	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	78	10	299.2	2	0	0	88	1014	3
5	6	26	177	23	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	76	10	299.2	2	0	0	91	1014	7
5	6	26	177	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	299.2	2	0	0	94	1013	7
5	6	27	178	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	299.2	2	0	0	94	1013	3
5	6	27	178	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	298.8	2	0	0	91	1013	7
5	6	27	178	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	108	10	298.1	2	0	0.25	94	1012	3
5	6	27	178	4	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	96	10	298.1	2	0	0	94	1013	0
5	6	27	178	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	97	10	298.1	2	0	0	94	1013	7
5	6	27	178	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	109	10	298.1	2	0	0	94	1013	7
5	6	27	178	7	-0.3	0.105	-9	-9	-999	78	398.4	0.37	0.38	0.42	0.9	111	10	299.2	2	0	0	94	1014	0
5	6	27	178	8	46.2	0.207	-9	-9	-999	216	-17.3	0.37	0.38	0.24	1.3	113	10	302	2	0	0	82	1014	5
5	6	27	178	9	57.2	0.233	-9	-9	-999	259	-20.1	0.37	0.38	0.2	1.5	91	10	302	2	0	0	85	1014	8
5	6	27	178	10	39.9	0.236	-9	-9	-999	264	-29.9	0.37	0.38	0.19	1.6	93	10	303.1	2	0	0	70	1014	10
5	6	27	178	11	49	0.262	-9	-9	-999	309	-33.3	0.37	0.38	0.19	1.8	109	10	303.8	2	0	0	68	1014	10
5	6	27	178	12	82.8	0.185	-9	-9	-999	185	-7	0.37	0.38	0.18	1	135	10	303.1	2	0	2.54	70	1014	9
5	6	27	178	13	80.2	0.285	-9	-9	-999	350	-26.1	0.37	0.38	0.18	1.9	114	10	303.1	2	0	0	70	1013	9
5	6	27	178	14	95.7	0.301	-9	-9	-999	379	-25.6	0.37	0.38	0.18	2	95	10	304.2	2	0	0	63	1013	8
5	6	27	178	15	75.4	0.294	-9	-9	-999	367	-30.5	0.37	0.38	0.19	2	99	10	304.2	2	0	0	66	1012	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	27	178	16	35	0.255	-9	-9	-999	297	-42.9	0.37	0.38	0.19	1.8	90	10	304.2	2	0	0	61	1012	10
5	6	27	178	17	8.3	0.2	-9	-9	-999	207	-86.7	0.37	0.38	0.22	1.5	86	10	303.8	2	0	0	63	1012	10
5	6	27	178	18	0.1	0.191	-9	-9	-999	192	-6303.6	0.655	0.64	0.34	1.3	85	10	302	2	0	0	75	1012	10
5	6	27	178	19	-3.4	0.073	-9	-9	-999	55	10.6	0.655	0.64	1	1	80	10	300.9	2	0	0	79	1012	7
5	6	27	178	20	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	77	10	300.9	2	0	0	79	1012	7
5	6	27	178	21	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	76	10	300.9	2	0	0	79	1013	7
5	6	27	178	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	300.4	2	0	0	82	1013	7
5	6	27	178	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	299.2	2	0	0	88	1013	7
5	6	27	178	24	-1.2	0.042	-9	-9	-999	20	5.6	0.37	0.38	1	0.7	107	10	300.4	2	0	0	82	1013	7
5	6	28	179	1	-0.9	0.036	-9	-9	-999	16	4.8	0.37	0.38	1	0.6	105	10	299.9	2	0	0	85	1012	7
5	6	28	179	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	99	10	299.2	2	0	0	88	1012	7
5	6	28	179	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	76	10	299.2	2	0	0	94	1012	7
5	6	28	179	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	298.1	2	0	0	94	1012	7
5	6	28	179	5	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	86	10	298.1	2	0	0	94	1012	0
5	6	28	179	6	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	62	10	298.1	2	0	0	94	1012	7
5	6	28	179	7	1.6	0.13	-9	-9	-999	108	-127.5	0.37	0.38	0.42	1	133	10	298.1	2	0	0	94	1013	9
5	6	28	179	8	73.9	0.192	-9	-9	-999	193	-8.6	0.736	0.77	0.23	0.8	158	10	298.8	2	0	0	91	1013	4
5	6	28	179	9	61.5	0.179	-9	-9	-999	174	-8.4	0.37	0.38	0.2	1	122	10	300.4	2	0	0	88	1013	8
5	6	28	179	10	81.8	0.257	-9	-9	-999	299	-18.6	0.655	0.64	0.18	1.3	78	10	302	2	0	0	80	1013	9
5	6	28	179	11	54.1	0.232	-9	-9	-999	257	-20.9	0.37	0.38	0.19	1.5	103	10	303.8	2	0	0	72	1013	10
5	6	28	179	12	73.6	0.272	-9	-9	-999	326	-24.6	0.37	0.38	0.18	1.8	118	10	305.4	2	0	0	70	1012	9
5	6	28	179	13	46.5	0.261	-9	-9	-999	307	-34.6	0.37	0.38	0.18	1.8	101	10	300.4	2	0	0	88	1012	10
5	6	28	179	14	42.1	0.259	-9	-9	-999	304	-37.3	0.37	0.38	0.18	1.8	104	10	302	2	0	0	82	1011	10
5	6	28	179	15	28.2	0.23	-9	-9	-999	253	-38.7	0.37	0.38	0.19	1.6	90	10	302	2	0	0	80	1011	10
5	6	28	179	16	41.5	0.259	-9	-9	-999	303	-37.7	0.37	0.38	0.19	1.8	98	10	302	2	0	0	80	1011	9
5	6	28	179	17	11	0.228	-9	-9	-999	250	-96.3	0.655	0.64	0.22	1.4	83	10	302	2	0	0	82	1011	10
5	6	28	179	18	0.1	0.134	-9	-9	-999	116	-2178.2	0.37	0.38	0.34	1.1	87	10	300.9	2	0	0	85	1012	7
5	6	28	179	19	-2.3	0.061	-9	-9	-999	37	9	0.736	0.77	1	0.8	141	10	300.4	2	0	0	94	1012	7
5	6	28	179	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	121	10	299.9	2	0	0	94	1012	7
5	6	28	179	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	300.4	2	0	0	94	1013	7
5	6	28	179	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	103	10	299.2	2	0	0	94	1013	7
5	6	28	179	23	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	71	10	298.8	2	0	0	97	1013	7
5	6	28	179	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	32	10	299.2	2	0	0	94	1012	7
5	6	29	180	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	37	10	299.2	2	0	0	94	1012	7
5	6	29	180	2	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	74	10	298.8	2	0	0	97	1011	0
5	6	29	180	3	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	106	10	298.1	2	0	0.76	94	1011	3
5	6	29	180	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	298.1	2	0	0	94	1011	7
5	6	29	180	5	-7.6	0.11	-9	-9	-999	84	15.8	0.655	0.64	1	1.5	78	10	298.1	2	0	1.52	97	1012	7
5	6	29	180	6	-4.1	0.085	-9	-9	-999	57	13.6	0.37	0.38	1	1.4	89	10	297	2	0	2.03	94	1013	10
5	6	29	180	7	0.1	0.098	-9	-9	-999	71	-858.5	0.37	0.38	0.42	0.8	120	10	297	2	0	1.52	100	1013	10
5	6	29	180	8	17	0.143	-9	-9	-999	124	-15.5	0.655	0.64	0.24	0.7	44	10	298.1	2	0	0.25	94	1013	10
5	6	29	180	9	63.2	0.182	-9	-9	-999	178	-8.6	0.655	0.64	0.19	0.8	55	10	299.2	2	0	0.25	94	1013	9
5	6	29	180	10	64	0.191	-9	-9	-999	193	-9.9	0.37	0.38	0.19	1.1	102	10	300.9	2	0	0	85	1013	9
5	6	29	180	11	86.4	0.21	-9	-9	-999	221	-9.6	0.37	0.38	0.19	1.2	110	10	303.1	2	0	0	75	1013	8
5	6	29	180	12	68.9	0.118	-9	-9	-999	96	-2.1	0.37	0.38	0.18	0.5	117	10	303.1	2	0	0	75	1013	9
5	6	29	180	13	66.7	0.238	-9	-9	-999	267	-18.2	0.655	0.64	0.18	1.2	335	10	303.1	2	0	0	75	1011	10
5	6	29	180	14	54.3	0.22	-9	-9	-999	237	-17.6	0.655	0.64	0.18	1.1	346	10	303.8	2	0	0	70	1011	10
5	6	29	180	15	14	0.096	-9	-9	-999	78	-5.7	0.37	0.38	0.19	0.5	136	10	304.2	2	0	3.81	68	1011	10
5	6	29	180	16	11.4	0.117	-9	-9	-999	92	-12.6	0.37	0.38	0.19	0.7	93	10	304.2	2	0	0	66	1011	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	6	29	180	17	5.4	0.097	-9	-9	-999	70	-15.2	0.37	0.38	0.22	0.6	118	10	302.5	2	0	0	75	1012	10
5	6	29	180	18	0.1	0.098	-9	-9	-999	71	-858	0.37	0.38	0.34	0.8	119	10	300.9	2	0	0	85	1012	7
5	6	29	180	19	-1.6	0.049	-9	-9	-999	25	6.4	0.37	0.38	1	0.8	110	10	300.9	2	0	0	85	1013	7
5	6	29	180	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	93	10	299.9	2	0	0	91	1013	0
5	6	29	180	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	97	10	300.4	2	0	0	88	1014	7
5	6	29	180	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	299.2	2	0	0	94	1014	7
5	6	29	180	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	50	10	299.2	2	0	0	97	1014	7
5	6	29	180	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	299.2	2	0	0	94	1014	7
5	6	30	181	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	98	10	298.1	2	0	0	94	1013	7
5	6	30	181	2	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	131	10	298.1	2	0	0	100	1013	7
5	6	30	181	3	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	133	10	299.2	2	0	0.76	94	1013	7
5	6	30	181	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	80	10	297	2	0	0	100	1014	7
5	6	30	181	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	93	10	298.1	2	0	0	97	1014	7
5	6	30	181	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	298.1	2	0	2.29	94	1014	7
5	6	30	181	7	-0.9	0.138	-9	-9	-999	117	262	0.37	0.38	0.43	1.2	117	10	299.2	2	0	5.08	94	1016	0
5	6	30	181	8	28.3	0.284	-9	-9	-999	347	-73.1	0.37	0.38	0.25	2.1	133	10	299.2	2	0	1.02	94	1016	9
5	6	30	181	9	41	0.248	-9	-9	-999	284	-33.5	0.37	0.38	0.2	1.7	99	10	298.1	2	0	0.25	94	1016	9
5	6	30	181	10	74.2	0.261	-9	-9	-999	308	-21.8	0.37	0.38	0.19	1.7	96	10	298.1	2	0	0	94	1015	8
5	6	30	181	11	115.2	0.284	-9	-9	-999	349	-18.1	0.37	0.38	0.19	1.8	105	10	299.9	2	0	0	85	1014	7
5	6	30	181	12	117.9	0.307	-9	-9	-999	391	-22.2	0.37	0.38	0.18	2	98	10	303.1	2	0	0	65	1014	7
5	6	30	181	13	115.8	0.339	-9	-9	-999	453	-30.3	0.37	0.38	0.18	2.3	98	10	304.2	2	0	0	66	1013	7
5	6	30	181	14	104.8	0.336	-9	-9	-999	448	-32.6	0.37	0.38	0.18	2.3	96	10	304.9	2	0	0	64	1012	8
5	6	30	181	15	75.4	0.327	-9	-9	-999	430	-41.9	0.37	0.38	0.19	2.3	107	10	304.2	2	0	0	61	1012	8
5	6	30	181	16	44.9	0.293	-9	-9	-999	365	-50.6	0.37	0.38	0.19	2.1	108	10	304.2	2	0	0	66	1012	9
5	6	30	181	17	16.5	0.209	-9	-9	-999	223	-50.3	0.37	0.38	0.22	1.5	87	10	303.1	2	0	0	70	1012	10
5	6	30	181	18	0.1	0.158	-9	-9	-999	145	-3769.2	0.37	0.38	0.34	1.3	89	10	302	2	0	0	75	1012	10
5	6	30	181	19	-1.6	0.049	-9	-9	-999	35	6.4	0.37	0.38	1	0.8	110	10	300.9	2	0	0	85	1013	7
5	6	30	181	20	-1.2	0.042	-9	-9	-999	20	5.6	0.37	0.38	1	0.7	112	10	300.4	2	0	0	91	1014	7
5	6	30	181	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	300.4	2	0	0	94	1014	7
5	6	30	181	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	300.4	2	0	0	94	1015	7
5	6	30	181	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	115	10	299.2	2	0	0	100	1015	7
5	6	30	181	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	299.2	2	0	0	94	1014	7
5	7	1	182	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	59	10	299.2	2	0	0	94	1014	7
5	7	1	182	2	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	83	10	298.8	2	0	0	94	1013	0
5	7	1	182	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	299.2	2	0	0	94	1013	7
5	7	1	182	4	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	52	10	298.1	2	0	0	94	1013	7
5	7	1	182	5	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	57	10	298.8	2	0	0	94	1014	7
5	7	1	182	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	75	10	299.2	2	0	0	88	1014	7
5	7	1	182	7	-0.7	0.166	-9	-9	-999	155	608	0.37	0.38	0.43	1.4	90	10	300.4	2	0	0	82	1015	0
5	7	1	182	8	50.9	0.263	-9	-9	-999	310	-32.4	0.37	0.38	0.25	1.8	95	10	301.4	2	0	0	82	1015	0
5	7	1	182	9	116.4	0.346	-9	-9	-999	468	-32.2	0.655	0.64	0.19	1.9	84	10	303.1	2	0	0	70	1015	6
5	7	1	182	10	105.2	0.282	-9	-9	-999	346	-19.3	0.37	0.38	0.19	1.8	86	10	304.2	2	0	0	70	1015	6
5	7	1	182	11	127.4	0.298	-9	-9	-999	375	-18.9	0.37	0.38	0.19	1.9	86	10	305.4	2	0	0	62	1015	6
5	7	1	182	12	130.4	0.31	-9	-9	-999	397	-20.7	0.37	0.38	0.18	2	90	10	305.9	2	0	0	60	1014	7
5	7	1	182	13	160.5	0.305	-9	-9	-999	387	-15.9	0.655	0.64	0.18	1.5	81	10	305.9	2	0	0	60	1014	8
5	7	1	182	14	88.6	0.288	-9	-9	-999	355	-24.3	0.37	0.38	0.18	1.9	103	10	305.4	2	0	0	60	1013	8
5	7	1	182	15	75.9	0.284	-9	-9	-999	347	-27.2	0.37	0.38	0.19	1.9	96	10	305.4	2	0	0	62	1013	8
5	7	1	182	16	45.4	0.282	-9	-9	-999	345	-44.9	0.37	0.38	0.19	2	96	10	305.4	2	0	0	58	1013	9
5	7	1	182	17	15.5	0.241	-9	-9	-999	273	-81.6	0.37	0.38	0.22	1.8	91	10	303.8	2	0	0	65	1014	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	1	182	18	0.1	0.194	-9	-9	-999	198	-6650.9	0.37	0.38	0.34	1.6	87	10	302	2	0	0	75	1014	3
5	7	1	182	19	-7.5	0.103	-9	-9	-999	79	13.1	0.655	0.64	1	1.4	82	10	300.9	2	0	0	79	1015	3
5	7	1	182	20	-4.7	0.081	-9	-9	-999	53	10.1	0.655	0.64	1	1.1	71	10	300.9	2	0	0	79	1016	0
5	7	1	182	21	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	68	10	300.4	2	0	0	77	1016	3
5	7	1	182	22	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	83	10	299.2	2	0	0	82	1016	3
5	7	1	182	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	105	10	298.8	2	0	0	91	1016	0
5	7	1	182	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	101	10	298.1	2	0	0	94	1015	3
5	7	2	183	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	67	10	298.1	2	0	0	94	1014	3
5	7	2	183	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	67	10	297.5	2	0	0	97	1014	0
5	7	2	183	3	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	65	10	298.1	2	0	0	94	1013	3
5	7	2	183	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	297	2	0	0	100	1014	3
5	7	2	183	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	75	10	297.5	2	0	0	94	1014	3
5	7	2	183	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	298.1	2	0	0	88	1015	3
5	7	2	183	7	-1.1	0.152	-9	-9	-999	136	280.2	0.655	0.64	0.42	1.1	79	10	299.2	2	0	0	82	1015	0
5	7	2	183	8	54.8	0.265	-9	-9	-999	313	-30.7	0.37	0.38	0.25	1.8	88	10	302.5	2	0	0	75	1015	0
5	7	2	183	9	80.9	0.307	-9	-9	-999	391	-32.4	0.37	0.38	0.2	2.1	97	10	303.1	2	0	0	70	1015	6
5	7	2	183	10	111.3	0.327	-9	-9	-999	429	-28.3	0.37	0.38	0.19	2.2	90	10	304.2	2	0	0	61	1015	5
5	7	2	183	11	114.9	0.349	-9	-9	-999	475	-33.6	0.37	0.38	0.19	2.4	105	10	305.4	2	0	0	58	1015	7
5	7	2	183	12	112.6	0.327	-9	-9	-999	430	-28.1	0.37	0.38	0.18	2.2	112	10	305.4	2	0	0	58	1015	8
5	7	2	183	13	125.4	0.341	-9	-9	-999	458	-28.6	0.37	0.38	0.18	2.3	101	10	305.9	2	0	0	56	1014	7
5	7	2	183	14	105.2	0.303	-9	-9	-999	385	-23.9	0.37	0.38	0.18	2	98	10	305.9	2	0	0	56	1013	8
5	7	2	183	15	75.9	0.273	-9	-9	-999	328	-24.1	0.37	0.38	0.19	1.8	109	10	305.4	2	0	0	58	1012	9
5	7	2	183	16	51.6	0.263	-9	-9	-999	311	-32	0.37	0.38	0.19	1.8	95	10	305.4	2	0	0	56	1012	9
5	7	2	183	17	13.3	0.228	-9	-9	-999	251	-80.2	0.37	0.38	0.22	1.7	109	10	304.2	2	0	0	61	1013	10
5	7	2	183	18	0.1	0.146	-9	-9	-999	130	-2822.6	0.37	0.38	0.34	1.2	111	10	303.1	2	0	0	65	1013	10
5	7	2	183	19	-2.5	0.061	-9	-9	-999	38	7.9	0.37	0.38	1	1	106	10	300.9	2	0	0	79	1014	7
5	7	2	183	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	300.4	2	0	0	82	1014	7
5	7	2	183	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	300.4	2	0	0	82	1015	7
5	7	2	183	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	299.2	2	0	0	82	1015	7
5	7	2	183	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	103	10	298.8	2	0	0	91	1015	0
5	7	2	183	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	109	10	298.1	2	0	0	94	1014	3
5	7	3	184	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	94	10	298.1	2	0	0	88	1014	3
5	7	3	184	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	74	10	297.5	2	0	0	94	1013	0
5	7	3	184	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	48	10	298.1	2	0	0	88	1013	3
5	7	3	184	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	298.1	2	0	0	88	1013	3
5	7	3	184	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	107	10	296.4	2	0	0	97	1013	0
5	7	3	184	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	98	10	297	2	0	0	94	1014	3
5	7	3	184	7	-0.4	0.036	-9	-9	-999	16	11.8	0.37	0.38	0.43	0.6	98	10	298.1	2	0	0	88	1014	0
5	7	3	184	8	66.4	0.197	-9	-9	-999	201	-10.4	0.655	0.64	0.24	0.9	29	10	300.9	2	0	0	82	1014	0
5	7	3	184	9	102.3	0.263	-9	-9	-999	311	-16.2	0.655	0.64	0.19	1.3	348	10	303.1	2	0	0	65	1014	7
5	7	3	184	10	116.1	0.307	-9	-9	-999	391	-22.5	0.655	0.64	0.18	1.6	341	10	305.4	2	0	0	58	1014	8
5	7	3	184	11	77.3	0.334	-9	-9	-999	443	-43.4	0.655	0.64	0.18	1.9	345	10	305.9	2	0	0	60	1013	10
5	7	3	184	12	48.5	0.347	-9	-9	-999	470	-78	0.655	0.64	0.18	2.1	353	10	305.9	2	0	0.25	60	1013	10
5	7	3	184	13	12.4	0.177	-9	-9	-999	191	-40.5	0.655	0.64	0.18	1	35	10	303.1	2	0	0.25	70	1012	10
5	7	3	184	14	11.1	0.162	-9	-9	-999	151	-34.7	0.655	0.64	0.18	0.9	65	10	300.9	2	0	0.25	88	1012	10
5	7	3	184	15	3.6	0.135	-9	-9	-999	114	-62.5	0.655	0.64	0.18	0.8	64	10	300.4	2	0	1.52	94	1012	10
5	7	3	184	16	6.5	0.142	-9	-9	-999	123	-39.7	0.655	0.64	0.19	0.8	49	10	299.2	2	0	0.76	94	1012	10
5	7	3	184	17	2.7	0.106	-9	-9	-999	80	-40.4	0.655	0.64	0.22	0.6	64	10	299.2	2	0	0	94	1012	10
5	7	3	184	18	0.1	0.104	-9	-9	-999	77	-1017	0.655	0.64	0.33	0.7	74	10	299.2	2	0	0.76	94	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	3	184	19	-1.2	0.044	-9	-9	-999	22	6.3	0.655	0.64	1	0.6	4	10	299.2	2	0	0.25	94	1013	7
5	7	3	184	20	-0.7	0.037	-9	-9	-999	16	6.5	0.655	0.64	1	0.5	57	10	298.8	2	0	0	97	1013	10
5	7	3	184	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	101	10	299.2	2	0	0	94	1014	7
5	7	3	184	22	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	99	10	298.1	2	0	0	100	1014	7
5	7	3	184	23	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	118	10	298.8	2	0	0	94	1013	7
5	7	3	184	24	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	99	10	298.1	2	0	0	100	1013	7
5	7	4	185	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	122	10	298.1	2	0	0	94	1012	7
5	7	4	185	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	126	10	297.5	2	0	0	97	1012	7
5	7	4	185	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	102	10	298.1	2	0	0	94	1012	7
5	7	4	185	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	298.1	2	0	0	94	1012	7
5	7	4	185	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	118	10	297.5	2	0	0	97	1012	7
5	7	4	185	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	0	100	1012	7
5	7	4	185	7	-0.4	0.038	-9	-9	-999	17	14.5	0.736	0.77	0.42	0.5	163	10	298.1	2	0	0	94	1013	0
5	7	4	185	8	41.9	0.194	-9	-9	-999	196	-15.6	0.736	0.77	0.24	0.9	164	10	299.9	2	0	0	91	1013	9
5	7	4	185	9	36.5	0.204	-9	-9	-999	212	-21.1	0.736	0.77	0.19	1	144	10	302	2	0	0.51	80	1014	10
5	7	4	185	10	52.5	0.154	-9	-9	-999	139	-6.3	0.736	0.77	0.18	0.6	184	10	304.2	2	0	0	70	1014	10
5	7	4	185	11	68.2	0.242	-9	-9	-999	273	-18.7	0.686	0.72	0.15	1.2	246	10	300.9	2	0	0	85	1013	10
5	7	4	185	12	27.6	0.181	-9	-9	-999	178	-19.4	0.265	0.28	0.14	1.3	258	10	300.4	2	0	0.25	82	1013	10
5	7	4	185	13	11.6	0.11	-9	-9	-999	85	-10.3	0.655	0.64	0.18	0.5	9	10	298.1	2	0	0.76	100	1013	10
5	7	4	185	14	0.4	0.113	-9	-9	-999	87	-296.1	0.37	0.38	0.18	0.9	139	10	298.1	2	0	2.29	91	1012	10
5	7	4	185	15	20.3	0.206	-9	-9	-999	215	-38.7	0.736	0.77	0.18	1.1	156	10	297	2	0	1.02	100	1011	10
5	7	4	185	16	12.7	0.129	-9	-9	-999	108	-15.4	0.736	0.77	0.18	0.6	176	10	298.1	2	0	0	94	1010	10
5	7	4	185	17	6.6	0.188	-9	-9	-999	188	-91.6	0.736	0.77	0.21	1.1	187	10	298.8	2	0	0	91	1010	10
5	7	4	185	18	0.1	0.122	-9	-9	-999	99	-1643.1	0.37	0.38	0.34	1	134	10	299.2	2	0	0	88	1010	10
5	7	4	185	19	-1.6	0.049	-9	-9	-999	27	6.3	0.37	0.38	1	0.8	110	10	298.1	2	0	0	94	1012	7
5	7	4	185	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	298.1	2	0	0	97	1013	7
5	7	4	185	21	-4.4	0.084	-9	-9	-999	56	12.3	0.736	0.77	1	1.1	150	10	298.1	2	0	0	94	1014	7
5	7	4	185	22	-3.6	0.084	-9	-9	-999	56	15.1	0.736	0.77	1	1.1	150	10	297	2	0	0	100	1014	10
5	7	4	185	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	133	10	297.5	2	0	0	97	1014	7
5	7	4	185	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	0	100	1014	7
5	7	5	186	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	68	10	297	2	0	0	94	1013	7
5	7	5	186	2	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	166	10	297	2	0	0	97	1013	7
5	7	5	186	3	-8.2	0.115	-9	-9	-999	90	16.8	0.736	0.77	1	1.5	212	10	297	2	0	2.03	94	1013	7
5	7	5	186	4	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	150	10	298.1	2	0	0.25	94	1013	7
5	7	5	186	5	-4.4	0.084	-9	-9	-999	56	12.3	0.736	0.77	1	1.1	173	10	297	2	0	2.29	100	1013	7
5	7	5	186	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	117	10	297	2	0	0.51	100	1014	7
5	7	5	186	7	0.1	0.104	-9	-9	-999	77	-1019.3	0.655	0.64	0.43	0.7	62	10	297	2	0	0	94	1015	10
5	7	5	186	8	5.6	0.119	-9	-9	-999	95	-27.4	0.37	0.38	0.25	0.8	96	10	297	2	0	0	94	1015	10
5	7	5	186	9	51.9	0.184	-9	-9	-999	181	-10.8	0.736	0.77	0.19	0.8	143	10	298.1	2	0	0	88	1016	9
5	7	5	186	10	75.4	0.264	-9	-9	-999	311	-22	0.736	0.77	0.18	1.3	170	10	299.2	2	0	0	88	1016	9
5	7	5	186	11	69.7	0.275	-9	-9	-999	333	-27.1	0.736	0.77	0.17	1.4	161	10	299.2	2	0	0	91	1016	10
5	7	5	186	12	102.5	0.341	-9	-9	-999	458	-35	0.736	0.77	0.17	1.8	164	10	300.4	2	0	0	88	1015	9
5	7	5	186	13	178	0.402	-9	-9	-999	586	-33	0.736	0.77	0.17	2.1	160	10	302	2	0	0	80	1014	8
5	7	5	186	14	108.2	0.356	-9	-9	-999	491	-37.8	0.736	0.77	0.17	1.9	149	10	303.1	2	0	0	72	1014	9
5	7	5	186	15	43.3	0.281	-9	-9	-999	346	-46.5	0.37	0.38	0.19	2	122	10	302	2	0	0	75	1013	10
5	7	5	186	16	46.9	0.261	-9	-9	-999	307	-34.3	0.37	0.38	0.19	1.8	112	10	303.1	2	0	0	70	1012	9
5	7	5	186	17	24.3	0.292	-9	-9	-999	363	-92.5	0.37	0.38	0.22	2.2	117	10	302	2	0	0	75	1013	9
5	7	5	186	18	0.1	0.194	-9	-9	-999	201	-6642.1	0.37	0.38	0.34	1.6	108	10	300.9	2	0	0	85	1013	10
5	7	5	186	19	-4.3	0.079	-9	-9	-999	60	10.3	0.37	0.38	1	1.3	109	10	300.4	2	0	0	88	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	5	186	20	-6.4	0.091	-9	-9	-999	63	10.6	0.37	0.38	1	1.5	113	10	299.9	2	0	0	88	1014	3
5	7	5	186	21	-8.3	0.103	-9	-9	-999	76	12	0.37	0.38	1	1.7	115	10	299.2	2	0	0	88	1014	3
5	7	5	186	22	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	111	10	299.2	2	0	0	88	1015	3
5	7	5	186	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	107	10	298.8	2	0	0	91	1015	0
5	7	5	186	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	298.1	2	0	0	94	1015	7
5	7	6	187	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	298.1	2	0	0	94	1014	7
5	7	6	187	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	298.8	2	0	0	94	1013	7
5	7	6	187	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	98	10	298.9	2	0	0	91	1013	7
5	7	6	187	4	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	71	10	299.2	2	0	0	88	1014	7
5	7	6	187	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	0	97	1014	7
5	7	6	187	6	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	131	10	298.1	2	0	0	94	1015	7
5	7	6	187	7	-1.6	0.135	-9	-9	-999	114	140	0.736	0.77	0.42	1	178	10	299.2	2	0	0	82	1015	0
5	7	6	187	8	72.3	0.22	0.868	0.005	328	238	-13.4	0.736	0.77	0.24	1	150	10	299.9	2	0	0	85	1016	4
5	7	6	187	9	87.6	0.296	1.131	0.005	598	370	-26.8	0.736	0.77	0.19	1.5	155	10	302	2	0	0.51	80	1016	8
5	7	6	187	10	11.4	0.237	0.582	0.005	628	266	-105.9	0.736	0.77	0.18	1.4	140	10	299.2	2	0	8.89	94	1017	10
5	7	6	187	11	92.9	0.197	1.295	0.005	848	202	-7.5	0.736	0.77	0.17	0.8	150	10	297.5	2	0	0.25	94	1016	9
5	7	6	187	12	217	0.283	1.872	0.005	1097	346	-9.5	0.736	0.77	0.17	1.2	184	10	300.4	2	0	0	77	1015	6
5	7	6	187	13	164.9	0.243	1.801	0.005	1284	277	-7.9	0.736	0.77	0.17	1	176	10	300.4	2	0	0	82	1015	8
5	7	6	187	14	91.5	0.233	1.522	0.005	1395	258	-12.4	0.655	0.64	0.18	1.1	62	10	302.5	2	0	0	75	1014	9
5	7	6	187	15	41.6	-9	-9	-9	1445	-999	-99999	0.542	0.56	0.17	0	0	10	303.1	2	0	0	65	1013	10
5	7	6	187	16	24.7	0.149	1.003	0.005	1473	132	-12.1	0.655	0.64	0.19	0.7	354	10	303.1	2	0	0	65	1013	10
5	7	6	187	17	4.8	0.151	0.581	0.005	1469	136	-65.1	0.655	0.64	0.22	0.9	85	10	300	3	0	0	74	1014	10
5	7	6	187	18	0.1	0.122	0.16	0.005	1464	98	-1648.4	0.37	0.38	0.34	1	130	10	298.6	3	0	0	79	1014	10
5	7	6	187	19	-1.3	0.042	-9	-9	-999	24	5.5	0.37	0.38	1	0.7	95	10	298.2	3	0	0	82	1015	7
5	7	6	187	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	84	10	298.2	3	0	0	85	1015	0
5	7	6	187	21	-2.5	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	80	10	298	3	0	0	88	1016	3
5	7	6	187	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	105	10	298.2	3	0	0	88	1017	7
5	7	6	187	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298	3	0	0	97	1017	7
5	7	6	187	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	297.9	3	0	0	94	1016	7
5	7	7	188	1	-2.5	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	67	10	297.4	3	0	0	94	1015	3
5	7	7	188	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	68	10	296.6	3	0	0	97	1015	0
5	7	7	188	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	65	10	296.4	3	0	0	94	1015	3
5	7	7	188	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	73	10	296.1	3	0	0	100	1015	3
5	7	7	188	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	70	10	295.9	3	0	0	100	1015	0
5	7	7	188	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	297.4	3	0	0	100	1016	3
5	7	7	188	7	-1.5	0.113	-9	-9	-999	88	85	0.37	0.38	0.44	1.1	86	10	299.8	3	0	0	94	1016	0
5	7	7	188	8	47.5	0.196	0.691	0.005	251	199	-14.3	0.37	0.38	0.25	1.2	107	10	302.1	3	0	0	82	1017	0
5	7	7	188	9	68.5	0.204	0.952	0.005	457	212	-11.3	0.37	0.38	0.2	1.2	106	10	302.9	3	0	0	75	1017	7
5	7	7	188	10	40.3	0.204	0.862	0.005	576	212	-19	0.37	0.38	0.19	1.3	102	10	301	3	0	1.27	85	1016	10
5	7	7	188	11	189.2	0.296	1.69	0.005	926	371	-12.4	0.655	0.64	0.18	1.4	83	10	303.1	3	0	0	91	1016	6
5	7	7	188	12	119.7	0.278	1.508	0.005	1039	337	-16.2	0.736	0.77	0.17	1.3	152	10	302	3	0	3.3	80	1016	9
5	7	7	188	13	110.7	0.217	1.516	0.005	1141	233	-8.3	0.736	0.77	0.17	0.9	146	10	300.4	3	0	2.54	75	1015	9
5	7	7	188	14	110	0.275	1.557	0.005	1243	332	-17.1	0.736	0.77	0.17	1.3	172	10	299.4	3	0	0.76	70	1015	9
5	7	7	188	15	92.4	0.197	1.504	0.005	1334	204	-7.5	0.736	0.77	0.18	0.8	161	10	300.5	3	0	0.51	66	1014	9
5	7	7	188	16	39	0.123	1.141	0.005	1375	100	-4.3	0.37	0.38	0.19	0.6	131	10	302	3	0	0	75	1014	9
5	7	7	188	17	21.2	0.133	0.936	0.005	1394	111	-9.9	0.655	0.64	0.22	0.6	60	10	301.8	3	0	0	75	1014	10
5	7	7	188	18	0.1	0.09	0.157	0.005	1391	62	-654.5	0.655	0.64	0.33	0.6	48	10	300.4	3	0	0	79	1014	10
5	7	7	188	19	-0.8	0.037	-9	-9	-999	17	5.3	0.655	0.64	1	0.5	56	10	299.4	3	0	0	88	1014	7
5	7	7	188	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	97	10	298.9	3	0	0	91	1015	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	7	188	21	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	91	10	298.4	3	0	0	88	1015	7
5	7	7	188	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	94	1016	7
5	7	7	188	23	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	106	10	297.9	3	0	0	91	1016	0
5	7	7	188	24	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	114	10	297.8	3	0	2.79	88	1015	7
5	7	8	189	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	296.9	3	0	10.67	94	1015	7
5	7	8	189	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	71	10	296.8	3	0	0	97	1015	7
5	7	8	189	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	121	10	297.2	3	0	0	94	1015	3
5	7	8	189	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	297.2	3	0	0	94	1015	3
5	7	8	189	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	296.9	3	0	0.51	97	1015	7
5	7	8	189	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	297	3	0	0	94	1015	7
5	7	8	189	7	-0.8	0.049	-9	-9	-999	25	13.8	0.37	0.38	0.44	0.8	93	10	298.6	3	0	0	100	1015	0
5	7	8	189	8	55.3	0.199	0.671	0.006	198	204	-12.9	0.37	0.38	0.25	1.2	92	10	301.1	3	0	0	94	1016	0
5	7	8	189	9	46.7	0.229	0.703	0.006	269	252	-23.2	0.37	0.38	0.2	1.5	106	10	300.2	3	0	5.84	94	1016	9
5	7	8	189	10	57.2	0.233	0.826	0.006	357	259	-20.1	0.37	0.38	0.19	1.5	104	10	299.4	3	0	0	88	1016	9
5	7	8	189	11	139.8	0.3	1.304	0.005	575	378	-17.5	0.655	0.64	0.18	1.5	81	10	301.8	3	0	0	91	1015	8
5	7	8	189	12	110.4	0.272	1.317	0.005	749	326	-16.5	0.37	0.38	0.18	1.7	120	10	303.1	3	0	0	82	1015	8
5	7	8	189	13	140.4	0.175	1.533	0.005	928	171	-3.4	0.736	0.77	0.17	0.6	158	10	303	3	0	0	79	1014	9
5	7	8	189	14	6	0.17	0.536	0.005	927	161	-74.1	0.265	0.28	0.14	1.4	267	10	298.9	3	0	20.07	70	1013	10
5	7	8	189	15	19.1	0.147	0.795	0.005	947	129	-14.9	0.686	0.72	0.15	0.7	240	10	298.8	3	0	0.25	65	1013	10
5	7	8	189	16	32.4	0.132	0.959	0.005	984	110	-6.4	0.37	0.38	0.19	0.7	119	10	300.6	3	0	0	65	1013	10
5	7	8	189	17	14.4	0.153	0.735	0.005	999	138	-22.6	0.37	0.38	0.22	1	100	10	300.8	3	0	0	72	1013	10
5	7	8	189	18	0.1	0.087	0.141	0.005	997	59	-585.1	0.37	0.38	0.34	0.7	106	10	299.8	3	0	0	79	1013	10
5	7	8	189	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	299.1	3	0	0	88	1014	7
5	7	8	189	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	70	10	298.5	3	0	0	85	1014	7
5	7	8	189	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	298	3	0	0	88	1014	7
5	7	8	189	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	297.9	3	0	0	94	1015	7
5	7	8	189	23	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	110	10	297.8	3	0	0	94	1014	0
5	7	8	189	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	297.6	3	0	0	94	1014	7
5	7	9	190	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	113	10	297.6	3	0	0	100	1013	7
5	7	9	190	2	-1.5	0.046	-9	-9	-999	23	5.8	0.736	0.77	1	0.6	156	10	297.9	3	0	0	97	1013	0
5	7	9	190	3	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	158	10	298.2	3	0	0	100	1013	7
5	7	9	190	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	94	1013	7
5	7	9	190	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.4	3	0	0	97	1014	7
5	7	9	190	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	99	10	297.9	3	0	0	100	1014	7
5	7	9	190	7	-0.8	0.08	-9	-9	-999	52	56.2	0.736	0.77	0.43	0.7	154	10	301	3	0	0	94	1015	0
5	7	9	190	8	36.6	0.218	-9	-9	-999	235	-25.7	0.736	0.77	0.24	1.1	180	10	300.4	3	0	0	94	1015	9
5	7	9	190	9	131.1	0.308	-9	-9	-999	393	-20.2	0.736	0.77	0.19	1.5	181	10	302.9	3	0	0	88	1015	5
5	7	9	190	10	141.6	0.366	-9	-9	-999	509	-31.4	0.736	0.77	0.18	1.9	187	10	302.9	3	0	0	79	1015	8
5	7	9	190	11	35.7	0.258	-9	-9	-999	307	-43.6	0.736	0.77	0.17	1.4	173	10	299.5	3	0	0.25	88	1015	10
5	7	9	190	12	44.1	0.194	-9	-9	-999	198	-15.1	0.37	0.38	0.18	1.2	138	10	300.5	3	0	0	88	1014	10
5	7	9	190	13	74.7	0.305	-9	-9	-999	387	-34.2	0.736	0.77	0.17	1.6	162	10	300.8	3	0	0	85	1014	10
5	7	9	190	14	31.5	0.166	-9	-9	-999	166	-13	0.37	0.38	0.18	1	137	10	300.5	3	0	0	77	1013	10
5	7	9	190	15	36.9	0.158	-9	-9	-999	144	-9.6	0.37	0.38	0.19	0.9	110	10	301.8	3	0	0	79	1013	10
5	7	9	190	16	19.1	0.146	-9	-9	-999	129	-14.8	0.37	0.38	0.19	0.9	127	10	301.8	3	0	0	79	1013	10
5	7	9	190	17	3.6	0.147	-9	-9	-999	130	-80.9	0.37	0.38	0.22	1.1	97	10	300.8	3	0	0	79	1014	10
5	7	9	190	18	0.1	0.165	-9	-9	-999	154	-4044.3	0.686	0.72	0.3	1.1	220	10	299.6	3	0	0	82	1014	7
5	7	9	190	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	3	0	0	88	1015	7
5	7	9	190	20	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	114	10	297.9	3	0	0	94	1015	7
5	7	9	190	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	133	10	297.9	3	0	0	94	1015	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	9	190	22	-1.3	0.049	-9	-9	-999	25	7.8	0.37	0.38	1	0.8	121	10	297.9	3	0	0.76	100	1016	10
5	7	9	190	23	-0.8	0.036	-9	-9	-999	16	5.8	0.37	0.38	1	0.6	86	10	297.6	3	0	0	97	1016	10
5	7	9	190	24	-1.7	0.055	-9	-9	-999	29	8.7	0.37	0.38	1	0.9	108	10	297.2	3	0	0.25	100	1015	10
5	7	10	191	1	-3.5	0.079	-9	-9	-999	51	12.6	0.37	0.38	1	1.3	130	10	297.1	3	0	2.54	100	1015	10
5	7	10	191	2	-1.3	0.049	-9	-9	-999	25	7.7	0.37	0.38	1	0.8	109	10	296.8	3	0	1.27	97	1014	10
5	7	10	191	3	-1.3	0.049	-9	-9	-999	25	7.7	0.37	0.38	1	0.8	104	10	296.6	3	0	1.78	100	1014	10
5	7	10	191	4	-1	0.042	-9	-9	-999	20	6.8	0.37	0.38	1	0.7	116	10	296.5	3	0	1.52	100	1014	10
5	7	10	191	5	-1.9	0.061	-9	-9	-999	35	11	0.736	0.77	1	0.8	147	10	296.6	3	0	0.76	97	1014	10
5	7	10	191	6	-2.4	0.069	-9	-9	-999	42	12.4	0.736	0.77	1	0.9	154	10	296.8	3	0	0.25	100	1015	10
5	7	10	191	7	2.8	0.113	0.134	0.008	30	87	-46.1	0.37	0.38	0.44	0.8	132	10	297.1	3	0	0.51	98	1015	9
5	7	10	191	8	38.2	0.169	0.584	0.008	188	160	-11.5	0.37	0.38	0.25	1	134	10	299	3	0	0	97	1015	7
5	7	10	191	9	126.5	0.251	1.068	0.006	349	289	-11.3	0.736	0.77	0.19	1.1	164	10	301.6	3	0	0	82	1016	6
5	7	10	191	10	125.3	0.293	1.207	0.005	508	365	-18.2	0.736	0.77	0.18	1.4	186	10	302.5	3	0	0	79	1016	8
5	7	10	191	11	73.4	0.16	1.068	0.005	601	157	-5.1	0.736	0.77	0.17	0.6	176	10	302	3	0	0	68	1015	10
5	7	10	191	12	52.2	0.163	0.986	0.005	663	151	-7.5	0.655	0.64	0.18	0.7	52	10	299.9	3	0	2.03	75	1015	10
5	7	10	191	13	96.2	0.248	1.311	0.005	847	284	-14.4	0.655	0.64	0.18	1.2	4	10	301.1	3	0	0	77	1014	9
5	7	10	191	14	35.5	0.223	0.956	0.005	891	242	-28.2	0.655	0.64	0.18	1.2	359	10	299	3	0	6.1	72	1014	10
5	7	10	191	15	105	0.264	1.447	0.005	1044	312	-15.9	0.655	0.64	0.18	1.3	20	10	301.1	3	0	0	75	1013	9
5	7	10	191	16	14.5	0.175	0.752	0.005	1059	171	-33.3	0.37	0.38	0.19	1.2	94	10	299.4	3	0	0	82	1013	10
5	7	10	191	17	5.9	0.141	0.56	0.005	1065	122	-42.5	0.655	0.64	0.21	0.8	68	10	298.9	3	0	0	88	1014	10
5	7	10	191	18	0.1	0.09	0.144	0.005	1064	62	-654.5	0.655	0.64	0.33	0.6	41	10	298.5	3	0	0	82	1014	7
5	7	10	191	19	-1.8	0.059	-9	-9	-999	33	10.3	0.655	0.64	1	0.8	69	10	298.1	3	0	0	82	1014	10
5	7	10	191	20	-0.9	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	76	10	297.9	3	0	0	88	1015	7
5	7	10	191	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	82	10	297.9	3	0	0	94	1015	7
5	7	10	191	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	297.5	3	0	0	100	1015	7
5	7	10	191	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	118	10	297.4	3	0	0	97	1015	7
5	7	10	191	24	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	140	10	297.4	3	0	0	94	1015	7
5	7	11	192	1	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	114	10	297.2	3	0	0	100	1014	7
5	7	11	192	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	92	10	296.8	3	0	0	94	1014	7
5	7	11	192	3	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	84	10	296.5	3	0	0	94	1014	7
5	7	11	192	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	296.2	3	0	0	100	1014	7
5	7	11	192	5	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	101	10	296	3	0	0	100	1014	7
5	7	11	192	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	3	0	0	100	1014	7
5	7	11	192	7	-1.2	0.076	-9	-9	-999	49	34.2	0.655	0.64	0.43	0.8	36	10	300.2	3	0	0	94	1015	0
5	7	11	192	8	62.9	0.167	-9	-9	-999	157	-6.7	0.655	0.64	0.24	0.7	72	10	301.8	3	0	2.03	79	1015	6
5	7	11	192	9	56.9	0.177	-9	-9	-999	171	-8.8	0.37	0.38	0.2	1	139	10	301.4	3	0	1.52	75	1015	8
5	7	11	192	10	129.5	0.251	-9	-9	-999	290	-11.1	0.736	0.77	0.18	1.1	148	10	302.8	3	0	0	66	1015	8
5	7	11	192	11	91.9	0.278	-9	-9	-999	337	-21.2	0.37	0.38	0.19	1.8	132	10	301.1	3	0	0.76	63	1015	8
5	7	11	192	12	94.9	0.29	-9	-9	-999	359	-23.2	0.37	0.38	0.18	1.9	109	10	302.2	3	0	0.25	66	1014	8
5	7	11	192	13	83.5	0.254	-9	-9	-999	294	-17.7	0.37	0.38	0.18	1.6	91	10	301.9	3	0	0	75	1013	9
5	7	11	192	14	75	0.294	-9	-9	-999	367	-30.7	0.37	0.38	0.18	2	130	10	302.6	3	0	0	75	1013	9
5	7	11	192	15	49.8	0.23	-9	-9	-999	255	-22.1	0.37	0.38	0.19	1.5	123	10	302.6	3	0	0	61	1013	10
5	7	11	192	16	40.5	0.258	-9	-9	-999	302	-38.4	0.37	0.38	0.19	1.8	125	10	302.6	3	0	0	65	1013	9
5	7	11	192	17	14.9	0.208	-9	-9	-999	219	-54.5	0.37	0.38	0.22	1.5	117	10	302	3	0	0	70	1013	10
5	7	11	192	18	0.1	0.158	-9	-9	-999	145	-3578.7	0.37	0.38	0.34	1.3	110	10	300.4	3	0	0	75	1013	10
5	7	11	192	19	-2.1	0.055	-9	-9	-999	37	7.1	0.37	0.38	1	0.9	109	10	299.2	3	0	0	82	1014	7
5	7	11	192	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	88	10	298.9	3	0	0	88	1014	0
5	7	11	192	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	298.4	3	0	0	88	1015	7
5	7	11	192	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	298.4	3	0	0	88	1015	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	11	192	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	103	10	298.2	3	0	0	91	1015	7
5	7	11	192	24	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	96	10	298.2	3	0	0	94	1015	3
5	7	12	193	1	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	104	10	298.1	3	0	0	88	1014	3
5	7	12	193	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	106	10	297.9	3	0	0	91	1014	7
5	7	12	193	3	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	85	10	297.8	3	0	0	94	1014	3
5	7	12	193	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	297.4	3	0	0	100	1014	3
5	7	12	193	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	80	10	297.2	3	0	0	94	1014	7
5	7	12	193	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	110	10	299.1	3	0	0	94	1015	7
5	7	12	193	7	-0.8	0.054	-9	-9	-999	29	17.8	0.736	0.77	0.43	0.7	164	10	300.4	3	0	0.25	88	1015	0
5	7	12	193	8	87.3	0.225	-9	-9	-999	246	-11.8	0.736	0.77	0.24	1	173	10	302	3	0	0	77	1016	0
5	7	12	193	9	132.5	0.308	-9	-9	-999	394	-20	0.736	0.77	0.19	1.5	158	10	302.9	3	0	0	70	1016	0
5	7	12	193	10	131.2	0.281	-9	-9	-999	342	-15.3	0.736	0.77	0.18	1.3	146	10	302.4	3	0	0.25	59	1016	8
5	7	12	193	11	212	0.22	-9	-9	-999	238	-4.5	0.736	0.77	0.17	0.8	144	10	305.4	3	0	0	56	1015	6
5	7	12	193	12	59.5	0.119	-9	-9	-999	98	-2.6	0.265	0.28	0.14	0.6	272	10	304.1	3	0	0	56	1015	9
5	7	12	193	13	105.2	0.223	-9	-9	-999	242	-9.5	0.655	0.64	0.18	1	337	10	304.2	3	0	0	56	1014	9
5	7	12	193	14	87.5	0.159	-9	-9	-999	146	-4.1	0.655	0.64	0.18	0.6	343	10	304.9	3	0	0	51	1013	9
5	7	12	193	15	45.5	0.131	-9	-9	-999	109	-4.4	0.655	0.64	0.18	0.5	45	10	304.4	3	0	0	54	1012	10
5	7	12	193	16	30	0.165	-9	-9	-999	154	-13.5	0.37	0.38	0.19	1	102	10	304	3	0	0	57	1012	10
5	7	12	193	17	16.6	0.199	-9	-9	-999	204	-42.6	0.37	0.38	0.22	1.4	109	10	303.4	3	0	0	61	1013	10
5	7	12	193	18	0.1	0.134	-9	-9	-999	114	-2181.1	0.37	0.38	0.34	1.1	110	10	300.9	3	0	0	70	1013	3
5	7	12	193	19	-1.8	0.049	-9	-9	-999	29	5.6	0.37	0.38	1	0.8	109	10	299.8	3	0	0	74	1013	3
5	7	12	193	20	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	82	10	299	3	0	0	79	1014	0
5	7	12	193	21	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	298.4	3	0	0	82	1014	3
5	7	12	193	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	297.5	3	0	0	94	1015	3
5	7	12	193	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	105	10	297.2	3	0	0	87	1014	0
5	7	12	193	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	116	10	296.9	3	0	0	90	1014	3
5	7	13	194	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	114	10	296.8	3	0	0	94	1013	3
5	7	13	194	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	101	10	296.6	3	0	0	93	1013	0
5	7	13	194	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.9	3	0	0	100	1012	3
5	7	13	194	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	131	10	296.5	3	0	0	97	1013	3
5	7	13	194	5	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	105	10	295.9	3	0	0	93	1013	0
5	7	13	194	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	29	10	297	3	0	0	100	1013	3
5	7	13	194	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.43	0	0	10	300	3	0	0	97	1013	0
5	7	13	194	8	64.4	0.25	-9	-9	-999	288	-22	0.655	0.64	0.24	1.3	350	10	302.4	3	0	0	88	1014	4
5	7	13	194	9	103.2	0.382	-9	-9	-999	543	-48.8	0.655	0.64	0.19	2.2	341	10	301.6	3	0	0	82	1014	7
5	7	13	194	10	101.4	0.342	-9	-9	-999	460	-35.6	0.655	0.64	0.18	1.9	339	10	301.5	3	0	0	75	1013	9
5	7	13	194	11	109.2	0.332	-9	-9	-999	439	-30.1	0.655	0.64	0.18	1.8	347	10	301.9	3	0	0	75	1013	9
5	7	13	194	12	96.2	0.247	-9	-9	-999	286	-14.2	0.265	0.28	0.14	1.7	326	10	303.2	3	0	0	66	1012	8
5	7	13	194	13	91.2	0.305	-9	-9	-999	388	-28.2	0.265	0.28	0.14	2.3	301	10	304.1	3	0	0	70	1011	8
5	7	13	194	14	67.6	0.408	-9	-9	-999	600	-90.6	0.655	0.64	0.18	2.5	339	10	301.8	3	0	0	80	1010	10
5	7	13	194	15	52.8	0.389	-9	-9	-999	558	-100.2	0.655	0.64	0.18	2.4	341	10	301.4	3	0	0	70	1009	10
5	7	13	194	16	27.1	0.362	-9	-9	-999	501	-157.6	0.655	0.64	0.19	2.3	344	10	300.9	3	0	0	88	1009	10
5	7	13	194	17	3.1	0.327	-9	-9	-999	431	-1000.3	0.655	0.64	0.21	2.2	342	10	300.1	3	0	0.51	74	1009	10
5	7	13	194	18	0.1	0.323	-9	-9	-999	422	-8888	0.655	0.64	0.33	2.2	344	10	299	3	0	0.51	88	1009	7
5	7	13	194	19	-6.3	0.094	-9	-9	-999	138	11.7	0.265	0.28	1	1.7	304	10	300.5	3	0	0.25	88	1009	7
5	7	13	194	20	-10	0.188	-9	-9	-999	188	60.4	0.265	0.28	1	2.1	332	10	300.4	3	0	0	91	1009	10
5	7	13	194	21	-10.9	0.116	-9	-9	-999	92	12.8	0.265	0.28	1	2.1	297	10	301.4	3	0	0	89	1009	3
5	7	13	194	22	-12.8	0.242	-9	-9	-999	274	99.9	0.265	0.28	1	2.5	293	10	301	3	0	0.76	88	1009	10
5	7	13	194	23	-10	0.188	-9	-9	-999	189	60.2	0.265	0.28	1	2.1	272	10	299.6	3	0	0.25	97	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	13	194	24	-9.4	0.177	-9	-9	-999	171	52.8	0.686	0.72	1	1.6	220	10	299.4	3	0	5.59	100	1009	10
5	7	14	195	1	-4.8	0.097	-9	-9	-999	71	17.2	0.686	0.72	1	1.3	232	10	298.1	3	0	23.88	100	1009	10
5	7	14	195	2	-5	0.1	-9	-9	-999	72	17.9	0.736	0.77	1	1.3	209	10	297.2	3	0	8.13	100	1009	10
5	7	14	195	3	-1.9	0.061	-9	-9	-999	35	11	0.736	0.77	1	0.8	182	10	297.5	3	0	9.65	100	1009	10
5	7	14	195	4	-4.2	0.092	-9	-9	-999	64	16.5	0.736	0.77	1	1.2	164	10	297.9	3	0	0.25	100	1010	10
5	7	14	195	5	-13.1	0.245	-9	-9	-999	279	101.4	0.736	0.77	1	1.9	179	10	298.1	3	0	4.06	97	1010	10
5	7	14	195	6	-14.1	0.263	-9	-9	-999	311	116.9	0.736	0.77	1	2	182	10	297.4	3	0	1.02	100	1012	10
5	7	14	195	7	0.4	0.201	-9	-9	-999	208	-1869.9	0.736	0.77	0.43	1.3	176	10	297.1	3	0	0	100	1012	9
5	7	14	195	8	24.5	0.223	-9	-9	-999	242	-40.8	0.736	0.77	0.24	1.2	170	10	298.4	3	0	0	93	1013	10
5	7	14	195	9	40.7	0.275	-9	-9	-999	331	-46	0.736	0.77	0.19	1.5	170	10	299.2	3	0	0	94	1013	10
5	7	14	195	10	82.4	0.308	-9	-9	-999	392	-31.9	0.736	0.77	0.18	1.6	168	10	301	3	0	0	88	1013	9
5	7	14	195	11	105.8	0.301	-9	-9	-999	380	-23.4	0.736	0.77	0.17	1.5	170	10	302.5	3	0	0	81	1013	9
5	7	14	195	12	134.7	0.351	-9	-9	-999	478	-29	0.736	0.77	0.17	1.8	161	10	303.5	3	0	0	75	1013	9
5	7	14	195	13	106.3	0.343	-9	-9	-999	462	-34.2	0.736	0.77	0.17	1.8	166	10	303.2	3	0	0	70	1012	9
5	7	14	195	14	72	0.248	-9	-9	-999	289	-19.2	0.736	0.77	0.17	1.2	141	10	303	3	0	0	72	1011	10
5	7	14	195	15	51.5	0.198	-9	-9	-999	203	-13.5	0.37	0.38	0.19	1.2	119	10	303.9	3	0	0	66	1010	9
5	7	14	195	16	31.1	0.199	-9	-9	-999	204	-22.7	0.37	0.38	0.19	1.3	136	10	303.8	3	0	0	70	1010	10
5	7	14	195	17	11.1	0.226	-9	-9	-999	246	-93.4	0.37	0.38	0.22	1.7	115	10	301.5	3	0	0	75	1011	10
5	7	14	195	18	0.1	0.158	-9	-9	-999	146	-3575.1	0.37	0.38	0.34	1.3	104	10	299.8	3	0	0	79	1012	7
5	7	14	195	19	-2.5	0.061	-9	-9	-999	40	7.9	0.37	0.38	1	1	86	10	299.2	3	0	0	88	1012	7
5	7	14	195	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	298.9	3	0	0	85	1013	7
5	7	14	195	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	298.5	3	0	0	88	1013	7
5	7	14	195	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	106	10	298.1	3	0	0	88	1014	7
5	7	14	195	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	298.2	3	0	0	91	1014	7
5	7	14	195	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	298.4	3	0	0	94	1013	7
5	7	15	196	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	298.4	3	0	0	94	1012	7
5	7	15	196	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298	3	0	0	97	1012	7
5	7	15	196	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	297.8	3	0	0	94	1011	7
5	7	15	196	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	297.6	3	0	0	94	1011	7
5	7	15	196	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	116	10	297.8	3	0	0	94	1012	7
5	7	15	196	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	115	10	299	3	0	0	94	1012	7
5	7	15	196	7	-1.9	0.104	-9	-9	-999	77	53.9	0.37	0.38	0.45	1.1	103	10	301.1	3	0	0	94	1013	0
5	7	15	196	8	39.9	0.269	0.604	0.005	200	321	-44	0.37	0.38	0.25	1.9	112	10	300.8	3	0	1.78	77	1014	7
5	7	15	196	9	74.1	0.261	0.936	0.005	400	308	-21.8	0.37	0.38	0.2	1.7	130	10	301.6	3	0	0.51	85	1014	7
5	7	15	196	10	103.5	0.325	1.25	0.005	683	425	-29.9	0.37	0.38	0.19	2.2	109	10	303.4	3	0	0	75	1013	6
5	7	15	196	11	99.3	0.334	1.329	0.005	855	445	-34	0.37	0.38	0.19	2.3	106	10	303.9	3	0	0	63	1013	8
5	7	15	196	12	118.5	0.383	1.477	0.005	984	545	-42.9	0.37	0.38	0.18	2.7	108	10	304.5	3	0	0	61	1012	7
5	7	15	196	13	125	0.374	1.571	0.005	1121	526	-37.7	0.37	0.38	0.18	2.6	98	10	305.2	3	0	0	58	1012	7
5	7	15	196	14	106.1	0.358	1.537	0.005	1235	493	-39.1	0.37	0.38	0.18	2.5	102	10	304.9	3	0	0	57	1011	8
5	7	15	196	15	74.3	0.316	1.394	0.006	1315	409	-38.3	0.37	0.38	0.19	2.2	105	10	304.4	3	0	0	61	1010	9
5	7	15	196	16	43.6	0.271	1.18	0.007	1361	325	-41.1	0.37	0.38	0.19	1.9	94	10	303.9	3	0	0	59	1010	9
5	7	15	196	17	17.6	0.243	0.876	0.007	1376	276	-73.5	0.37	0.38	0.22	1.8	103	10	302.9	3	0	0	63	1011	10
5	7	15	196	18	0.1	0.17	0.156	0.007	1371	163	-4452.3	0.37	0.38	0.34	1.4	91	10	301	3	0	0	70	1011	10
5	7	15	196	19	-2.3	0.055	-9	-9	-999	41	6.3	0.37	0.38	1	0.9	88	10	299.9	3	0	0	74	1012	3
5	7	15	196	20	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	78	10	299.1	3	0	0	82	1012	0
5	7	15	196	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	74	10	298.8	3	0	0	77	1013	3
5	7	15	196	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	298.4	3	0	0	81	1014	3
5	7	15	196	23	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	89	10	298.4	3	0	0	85	1014	3
5	7	15	196	24	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	86	10	298.4	3	0	0	82	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	16	197	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	298	3	0	0	94	1013	3
5	7	16	197	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	79	10	297.8	3	0	0	94	1013	0
5	7	16	197	3	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	91	10	296.9	3	0	8.38	94	1013	3
5	7	16	197	4	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	112	10	296.1	3	0	0	88	1013	3
5	7	16	197	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	78	10	296.6	3	0	0	94	1013	3
5	7	16	197	6	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	92	10	297.8	3	0	0	100	1013	7
5	7	16	197	7	-2.2	0.11	-9	-9	-999	84	54.9	0.655	0.64	0.44	1	76	10	300.4	3	0	0	94	1014	0
5	7	16	197	8	76.8	0.255	-9	-9	-999	296	-19.5	0.655	0.64	0.24	1.3	82	10	302.4	3	0	0	80	1013	0
5	7	16	197	9	85.5	0.243	-9	-9	-999	275	-15.1	0.37	0.38	0.2	1.5	88	10	303.9	3	0	0	75	1013	0
5	7	16	197	10	114.2	0.25	-9	-9	-999	288	-12.4	0.37	0.38	0.19	1.5	86	10	305	3	0	0	66	1013	5
5	7	16	197	11	109.9	0.249	-9	-9	-999	286	-12.7	0.37	0.38	0.19	1.5	113	10	305.4	3	0	0	56	1013	7
5	7	16	197	12	124.2	0.253	-9	-9	-999	293	-11.8	0.37	0.38	0.18	1.5	120	10	306.2	3	0	0	50	1013	7
5	7	16	197	13	128.3	0.243	-9	-9	-999	275	-10.1	0.37	0.38	0.18	1.4	110	10	306.8	3	0	0	54	1012	7
5	7	16	197	14	109.3	0.249	-9	-9	-999	286	-12.8	0.37	0.38	0.18	1.5	110	10	306.5	3	0	0	51	1012	8
5	7	16	197	15	82.3	0.275	-9	-9	-999	332	-22.8	0.37	0.38	0.19	1.8	111	10	305.8	3	0	0	56	1011	8
5	7	16	197	16	51.5	0.242	-9	-9	-999	274	-24.7	0.37	0.38	0.19	1.6	110	10	305.1	3	0	0	56	1010	9
5	7	16	197	17	18	0.211	-9	-9	-999	223	-47	0.37	0.38	0.22	1.5	93	10	303.8	3	0	0	59	1010	10
5	7	16	197	18	0.1	0.17	-9	-9	-999	162	-4450.8	0.37	0.38	0.34	1.4	91	10	301.5	3	0	0	70	1010	10
5	7	16	197	19	-4.8	0.079	-9	-9	-999	54	9.2	0.37	0.38	1	1.3	93	10	300.2	3	0	0	74	1012	3
5	7	16	197	20	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	73	10	299.4	3	0	0	82	1013	0
5	7	16	197	21	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	83	10	299	3	0	0	77	1013	3
5	7	16	197	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	83	10	298.6	3	0	0	77	1014	3
5	7	16	197	23	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	86	10	298.4	3	0	0	79	1013	3
5	7	16	197	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	117	10	298.4	3	0	0	79	1013	3
5	7	17	198	1	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	81	10	298.4	3	0	0.76	85	1013	3
5	7	17	198	2	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	297.6	3	0	0	94	1012	7
5	7	17	198	3	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	297.2	3	0	0.51	94	1012	7
5	7	17	198	4	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	100	10	297.2	3	0	0.51	94	1012	7
5	7	17	198	5	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	79	10	297.2	3	0	0	97	1013	7
5	7	17	198	6	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	90	10	297.5	3	0	0	94	1013	7
5	7	17	198	7	-1.5	0.066	-9	-9	-999	39	17.1	0.655	0.64	0.44	0.9	76	10	298.6	3	0	0	88	1013	0
5	7	17	198	8	44	0.183	-9	-9	-999	180	-12.6	0.37	0.38	0.25	1.1	104	10	301.1	3	0	0	82	1014	3
5	7	17	198	9	87.9	0.287	-9	-9	-999	354	-24.4	0.37	0.38	0.2	1.9	111	10	303.8	3	0	0	79	1014	0
5	7	17	198	10	95.9	0.301	-9	-9	-999	379	-25.6	0.37	0.38	0.19	2	137	10	302.9	3	0	0	75	1015	7
5	7	17	198	11	75.4	0.24	-9	-9	-999	271	-16.5	0.37	0.38	0.19	1.5	124	10	303.9	3	0	0	72	1014	9
5	7	17	198	12	80.2	0.241	-9	-9	-999	272	-15.8	0.37	0.38	0.18	1.5	111	10	302.9	3	0	3.81	80	1014	9
5	7	17	198	13	23.7	0.222	-9	-9	-999	241	-41.9	0.736	0.77	0.17	1.2	188	10	299.6	3	0	5.08	62	1013	10
5	7	17	198	14	31.5	0.131	-9	-9	-999	112	-6.5	0.37	0.38	0.18	0.7	136	10	300.6	3	0	1.02	64	1012	10
5	7	17	198	15	91.7	0.256	-9	-9	-999	297	-16.4	0.736	0.77	0.18	1.2	158	10	302.8	3	0	0	62	1012	9
5	7	17	198	16	26.6	0.185	-9	-9	-999	184	-21.5	0.37	0.38	0.19	1.2	138	10	301.8	3	0	0	61	1011	10
5	7	17	198	17	9.9	0.159	-9	-9	-999	146	-36.4	0.37	0.38	0.22	1.1	122	10	301.6	3	0	0	72	1010	10
5	7	17	198	18	0.1	0.11	-9	-9	-999	84	-1207.3	0.37	0.38	0.34	0.9	110	10	300.5	3	0	0	75	1011	10
5	7	17	198	19	-1.6	0.049	-9	-9	-999	26	6.3	0.37	0.38	1	0.8	106	10	299.9	3	0	0	79	1012	7
5	7	17	198	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	114	10	299.4	3	0	0	82	1013	7
5	7	17	198	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	107	10	299.1	3	0	0	88	1014	7
5	7	17	198	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	103	10	298.9	3	0	0	88	1015	7
5	7	17	198	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	104	10	298.5	3	0	0	94	1014	0
5	7	17	198	24	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	152	10	298.2	3	0	0	88	1014	7
5	7	18	199	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	88	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	18	199	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	94	1012	0
5	7	18	199	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	297.9	3	0	0	94	1012	7
5	7	18	199	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.4	3	0	0	94	1012	7
5	7	18	199	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.2	3	0	0	97	1013	0
5	7	18	199	6	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	157	10	297.9	3	0	0	100	1013	7
5	7	18	199	7	-0.7	0.042	-9	-9	-999	20	10.6	0.37	0.38	0.45	0.7	126	10	300.9	3	0	0	88	1014	0
5	7	18	199	8	64.3	0.189	0.874	0.005	376	189	-9.5	0.736	0.77	0.24	0.8	142	10	301.4	3	0	0	85	1014	7
5	7	18	199	9	69.6	0.238	1.056	0.005	613	267	-17.5	0.37	0.38	0.2	1.5	126	10	302.8	3	0	0	82	1015	7
5	7	18	199	10	169.4	0.386	1.621	0.005	911	552	-30.8	0.736	0.77	0.18	2	184	10	302.9	3	0	0	94	1014	6
5	7	18	199	11	49.2	0.208	1.092	0.005	957	240	-16.5	0.37	0.38	0.19	1.3	128	10	301	3	0	0	70	1014	10
5	7	18	199	12	71	0.227	1.263	0.005	1028	249	-14.9	0.37	0.38	0.18	1.4	127	10	302	3	0	0	94	1014	9
5	7	18	199	13	86.6	0.287	1.387	0.005	1115	354	-24.7	0.37	0.38	0.18	1.9	136	10	303.2	3	0	0.51	88	1013	9
5	7	18	199	14	64.2	0.355	1.277	0.005	1172	486	-62.7	0.736	0.77	0.17	2	144	10	300	3	0	0	80	1013	10
5	7	18	199	15	12	0.183	0.733	0.005	1181	200	-46.1	0.37	0.38	0.19	1.3	118	10	298.9	3	0	0	94	1012	10
5	7	18	199	16	18.9	0.184	0.857	0.005	1200	182	-29.9	0.655	0.64	0.19	1	76	10	299	3	0	0	88	1012	10
5	7	18	199	17	7.9	0.197	0.643	0.005	1208	201	-86.6	0.655	0.64	0.21	1.2	76	10	299.4	3	0	0	82	1012	10
5	7	18	199	18	0.1	0.191	0.15	0.005	1207	192	-6309.9	0.655	0.64	0.33	1.3	71	10	298.6	3	0	0	88	1013	7
5	7	18	199	19	-5.7	0.095	-9	-9	-999	71	13.7	0.655	0.64	1	1.3	82	10	298.4	3	0	0	92	1013	7
5	7	18	199	20	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	102	10	298.1	3	0	0	97	1014	7
5	7	18	199	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	76	10	297.9	3	0	0	100	1015	7
5	7	18	199	22	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	72	10	297.6	3	0	0	100	1015	7
5	7	18	199	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	297.6	3	0	0	94	1014	7
5	7	18	199	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297.6	3	0	0	94	1014	7
5	7	19	200	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	297.4	3	0	0	94	1012	7
5	7	19	200	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	101	10	297.5	3	0	0	94	1012	7
5	7	19	200	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	297.4	3	0	0	94	1012	3
5	7	19	200	4	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	104	10	297.8	3	0	0	94	1012	3
5	7	19	200	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	297.8	3	0	0	94	1012	7
5	7	19	200	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	102	10	298.4	3	0	0	100	1013	7
5	7	19	200	7	-4.6	0.214	-9	-9	-999	227	191.6	0.37	0.38	0.45	1.9	132	10	301.4	3	0	0	94	1014	0
5	7	19	200	8	50.9	0.35	0.765	0.005	318	476	-76.2	0.37	0.38	0.25	2.6	134	10	302.4	3	0	0	88	1014	0
5	7	19	200	9	123.6	0.443	1.361	0.005	738	677	-63.5	0.736	0.77	0.19	2.5	143	10	303.2	3	0	0	80	1014	6
5	7	19	200	10	140.3	0.447	1.572	0.005	1003	688	-57.7	0.736	0.77	0.18	2.5	145	10	303.9	3	0	0	75	1014	8
5	7	19	200	11	101.9	0.389	1.489	0.005	1173	561	-52.4	0.37	0.38	0.19	2.8	134	10	304.2	3	0	0	75	1014	8
5	7	19	200	12	171.1	0.468	1.852	0.006	1344	737	-54.2	0.736	0.77	0.17	2.6	143	10	303.9	3	0	0	70	1013	8
5	7	19	200	13	97.2	0.356	1.548	0.006	1379	496	-41.8	0.37	0.38	0.18	2.5	138	10	304.6	3	0	0	66	1012	8
5	7	19	200	14	123.2	0.47	1.693	0.006	1423	740	-75.9	0.736	0.77	0.17	2.7	141	10	304.4	3	0	0	63	1012	9
5	7	19	200	15	62.2	0.381	1.353	0.006	1440	545	-80	0.736	0.77	0.18	2.2	147	10	300.2	3	0	0.25	70	1012	10
5	7	19	200	16	26	0.25	1.014	0.006	1449	296	-54	0.37	0.38	0.19	1.8	120	10	300	3	0	0	80	1011	10
5	7	19	200	17	19.1	0.255	0.917	0.006	1456	297	-78.6	0.37	0.38	0.22	1.9	106	10	300.4	3	0	0	91	1012	10
5	7	19	200	18	0.1	0.158	0.159	0.006	1454	148	-3575.1	0.37	0.38	0.34	1.3	97	10	298.9	3	0	0	88	1012	10
5	7	19	200	19	-3.7	0.073	-9	-9	-999	48	9.5	0.37	0.38	1	1.2	90	10	298.4	3	0	0	82	1012	7
5	7	19	200	20	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	93	10	298.1	3	0	0	88	1013	7
5	7	19	200	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	84	10	298.2	3	0	0	94	1014	7
5	7	19	200	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	298	3	0	0	91	1014	7
5	7	19	200	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	298.2	3	0	0	88	1014	7
5	7	19	200	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	298.2	3	0	0	100	1014	7
5	7	20	201	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	62	10	297.8	3	0	0	94	1013	7
5	7	20	201	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	66	10	297.6	3	0	0	97	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	20	201	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	81	10	297.6	3	0	0	94	1012	3
5	7	20	201	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297.6	3	0	0	94	1012	3
5	7	20	201	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	297.9	3	0	1.52	94	1013	7
5	7	20	201	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	129	10	298.2	3	0	0	100	1014	7
5	7	20	201	7	-0.5	0.036	-9	-9	-999	16	8.5	0.37	0.38	0.45	0.6	90	10	300.1	3	0	0.25	94	1014	0
5	7	20	201	8	64.1	0.237	0.757	0.005	244	265	-18.7	0.655	0.64	0.24	1.2	74	10	302	3	0	0	85	1015	4
5	7	20	201	9	64.2	0.225	0.883	0.005	388	245	-16	0.37	0.38	0.2	1.4	113	10	301.1	3	0	2.79	80	1015	8
5	7	20	201	10	41.8	0.248	0.823	0.005	483	284	-33	0.37	0.38	0.19	1.7	93	10	301.6	3	0	0.25	85	1015	10
5	7	20	201	11	75.7	0.218	1.11	0.005	653	234	-12.3	0.37	0.38	0.19	1.3	108	10	301.4	3	0	0	91	1015	9
5	7	20	201	12	118	0.234	1.407	0.005	855	261	-9.8	0.736	0.77	0.17	1	165	10	302.6	3	0	0	85	1014	9
5	7	20	201	13	25.5	0.305	0.851	0.005	875	388	-101.1	0.736	0.77	0.17	1.8	204	10	299.1	3	0	10.67	80	1014	10
5	7	20	201	14	35.5	0.158	0.963	0.005	910	157	-10	0.686	0.72	0.15	0.7	219	10	299.4	3	0	2.03	66	1013	10
5	7	20	201	15	94.5	-9	-9	-9	1005	-999	-99999	0.542	0.56	0.17	0	0	10	301.9	3	0	0	75	1012	9
5	7	20	201	16	29.4	0.138	0.944	0.005	1034	118	-8	0.655	0.64	0.19	0.6	20	10	301.9	3	0	0	66	1012	10
5	7	20	201	17	26.2	0.177	0.917	0.005	1059	171	-19.1	0.655	0.64	0.21	0.9	7	10	301.4	3	0	0	77	1012	10
5	7	20	201	18	0.1	0.11	0.143	0.005	1057	85	-1208.5	0.37	0.38	0.34	0.9	101	10	300.8	3	0	0.51	79	1012	10
5	7	20	201	19	-2	0.054	-9	-9	-999	29	7	0.736	0.77	1	0.7	160	10	299	3	0	0	88	1013	3
5	7	20	201	20	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	149	10	298.6	3	0	0	97	1014	7
5	7	20	201	21	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	136	10	298.5	3	0	0	94	1014	3
5	7	20	201	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.4	3	0	0	94	1015	3
5	7	20	201	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.4	3	0	0	97	1015	0
5	7	20	201	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	94	1014	7
5	7	21	202	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	100	1014	7
5	7	21	202	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	94	10	297.6	3	0	0.51	97	1013	7
5	7	21	202	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	105	10	297.6	3	0	0.51	94	1013	3
5	7	21	202	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	133	10	297.6	3	0	0	100	1013	7
5	7	21	202	5	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	114	10	297.8	3	0	0.51	100	1013	7
5	7	21	202	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	298	3	0	0	94	1014	3
5	7	21	202	7	-0.9	0.049	-9	-9	-999	25	11.1	0.37	0.38	0.45	0.8	138	10	300.1	3	0	0	94	1014	0
5	7	21	202	8	40	0.159	0.619	0.005	214	145	-9	0.37	0.38	0.25	0.9	88	10	301.6	3	0	0	94	1015	6
5	7	21	202	9	57.4	0.221	0.807	0.005	331	239	-17	0.655	0.64	0.19	1.1	84	10	301.9	3	0	0	88	1015	9
5	7	21	202	10	31.7	0.221	0.701	0.005	393	238	-30.6	0.655	0.64	0.18	1.2	85	10	299	3	0	2.79	94	1016	10
5	7	21	202	11	140	0.245	1.381	0.005	681	279	-9.5	0.655	0.64	0.18	1.1	85	10	302.2	3	0	0	82	1015	8
5	7	21	202	12	104.5	0.259	1.348	0.005	848	303	-15.1	0.37	0.38	0.18	1.6	99	10	304	3	0	0	70	1014	8
5	7	21	202	13	105.9	0.282	1.407	0.005	951	344	-19.1	0.37	0.38	0.18	1.8	97	10	304.4	3	0	0	61	1013	8
5	7	21	202	14	87.1	0.277	1.356	0.005	1035	335	-21.9	0.37	0.38	0.18	1.8	94	10	304.5	3	0	0	65	1012	9
5	7	21	202	15	89.6	0.266	1.406	0.005	1122	316	-19.1	0.37	0.38	0.19	1.7	99	10	305	3	0	0	59	1012	8
5	7	21	202	16	29.7	0.252	0.981	0.005	1146	291	-48.7	0.37	0.38	0.19	1.8	119	10	303.4	3	0	0	59	1012	10
5	7	21	202	17	16.3	0.231	0.805	0.005	1154	255	-68.2	0.37	0.38	0.22	1.7	113	10	302.5	3	0	0	65	1012	10
5	7	21	202	18	0.8	0.138	0.299	0.005	1153	121	-285.9	0.37	0.38	0.34	1.1	93	10	301.2	3	0	0	70	1013	10
5	7	21	202	19	-1.8	0.049	-9	-9	-999	30	5.6	0.37	0.38	1	0.8	94	10	300.2	3	0	0	79	1013	3
5	7	21	202	20	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	91	10	299.4	3	0	0	82	1014	7
5	7	21	202	21	-5.6	0.088	-9	-9	-999	60	11	0.655	0.64	1	1.2	85	10	298.5	3	0	0	94	1015	0
5	7	21	202	22	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	81	10	298.2	3	0	0	94	1015	7
5	7	21	202	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	298.1	3	0	0	94	1015	7
5	7	21	202	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	117	10	298	3	0	0	94	1015	7
5	7	22	203	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.8	3	0	0	94	1014	7
5	7	22	203	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	297.5	3	0	0	97	1014	7
5	7	22	203	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	115	10	297.4	3	0	0	100	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	22	203	4	-1.8	0.054	-9	-9	-999	29	7.8	0.736	0.77	1	0.7	142	10	297.1	3	0	0	100	1014	7
5	7	22	203	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	83	10	297.4	3	0	0	97	1014	7
5	7	22	203	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	68	10	298.5	3	0	0	100	1014	7
5	7	22	203	7	-0.9	0.049	-9	-9	-999	25	11.5	0.37	0.38	0.45	0.8	86	10	301.2	3	0	0	94	1015	0
5	7	22	203	8	60.4	0.178	0.922	0.007	471	173	-8.5	0.37	0.38	0.25	1	112	10	303.1	3	0	0	85	1016	0
5	7	22	203	9	85.6	0.221	1.186	0.008	707	239	-11.4	0.37	0.38	0.2	1.3	121	10	304.2	3	0	0	80	1016	0
5	7	22	203	10	113.1	0.239	1.343	0.007	777	269	-11	0.37	0.38	0.19	1.4	120	10	305.4	3	0	0	70	1016	5
5	7	22	203	11	125.2	-9	-9	-9	845	-999	-99999	0.542	0.56	0.17	0	0	10	305.8	3	0	0	62	1015	8
5	7	22	203	12	155	0.489	1.581	0.005	922	786	-68.1	0.37	0.38	0.18	3.6	89	10	305.4	2	0	-9	58	1013	3
5	7	22	203	13	156.8	0.435	1.622	0.005	984	663	-47.5	0.37	0.38	0.18	3.1	90	10	305.4	2	0	-9	58	1012	3
5	7	22	203	14	149.2	0.654	1.625	0.005	1040	1217	-169.5	0.37	0.38	0.18	5.1	95	10	305.9	2	0	-9	58	1012	3
5	7	22	203	15	173.1	-9	-9	-9	1199	-999	-99999	0.542	0.56	0.17	99.8	999	10	305.1	2	0	-9	59	1012	3
5	7	22	203	16	116	-9	-9	-9	1356	-999	-99999	0.542	0.56	0.17	99.8	999	10	304.4	2	0	-9	61	1011	99
5	7	22	203	17	58.9	0.464	1.327	0.005	1433	727	-153.1	0.37	0.38	0.22	3.6	92	10	303.8	2	0	-9	63	1011	0
5	7	22	203	18	26.5	0.541	1.024	0.005	1465	914	-539	0.655	0.64	0.33	3.6	73	10	303.1	2	0	-9	70	1011	3
5	7	22	203	19	8.9	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.9	2	0	-9	79	1012	3
5	7	22	203	20	-8.6	0.11	-9	-9	-999	84	14.1	0.655	0.64	1	1.5	80	10	300.4	2	0	-9	85	1013	3
5	7	22	203	21	-41	0.404	-9	-9	-999	591	145.4	0.655	0.64	1	3.1	69	10	300.4	2	0	-9	82	1013	3
5	7	22	203	22	-26.7	0.333	-9	-9	-999	444	124.7	0.655	0.64	1	2.6	75	10	300.4	2	0	-9	82	1014	7
5	7	22	203	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	91	1014	7
5	7	22	203	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	7
5	7	23	204	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1013	7
5	7	23	204	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1012	7
5	7	23	204	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	7
5	7	23	204	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	7
5	7	23	204	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	97	1012	0
5	7	23	204	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1013	7
5	7	23	204	7	0.5	-9	-9	-9	15	-999	-99999	0.542	0.56	0.44	0	0	10	299.2	2	0	-9	88	1013	3
5	7	23	204	8	49.2	-9	-9	-9	294	-999	-99999	0.542	0.56	0.23	0	0	10	300.4	2	0	-9	85	1014	7
5	7	23	204	9	113.2	-9	-9	-9	608	-999	-99999	0.542	0.56	0.18	0	0	10	302	2	0	-9	85	1014	3
5	7	23	204	10	154	0.742	1.557	0.005	888	1469	-239.6	0.736	0.77	0.18	4.6	204	10	304.2	2	0	-9	70	1014	7
5	7	23	204	11	165.1	0.647	1.686	0.005	1051	1210	-148.5	0.655	0.64	0.18	4.1	84	10	304.2	2	0	-9	68	1013	7
5	7	23	204	12	154.6	0.6	1.726	0.005	1204	1072	-125.9	0.37	0.38	0.18	4.6	87	10	304.2	2	0	-9	70	1013	3
5	7	23	204	13	156.5	0.656	1.805	0.005	1359	1219	-162.6	0.37	0.38	0.18	5.1	95	10	304.2	2	0	-9	66	1012	3
5	7	23	204	14	211.6	1.082	2.089	0.006	1559	2585	-539.6	0.655	0.64	0.18	7.2	75	10	305.4	2	0	-9	60	1012	0
5	7	23	204	15	129.2	0.483	1.797	0.005	1623	1244	-78.8	0.37	0.38	0.19	3.6	104	10	304.2	2	0	-9	70	1011	3
5	7	23	204	16	144	0.862	1.891	0.006	1695	1838	-401.6	0.655	0.64	0.19	5.7	85	10	304.2	2	0	-9	61	1011	3
5	7	23	204	17	62	0.522	1.436	0.005	1725	992	-206.3	0.37	0.38	0.22	4.1	91	10	303.8	2	0	-9	65	1011	3
5	7	23	204	18	17.8	0.332	0.948	0.005	1730	490	-185.9	0.37	0.38	0.34	2.6	95	10	302	2	0	-9	80	1011	3
5	7	23	204	19	-6.4	0.091	-9	-9	-999	175	10.6	0.37	0.38	1	1.5	89	10	300.9	2	0	-9	85	1011	3
5	7	23	204	20	-32	0.317	-9	-9	-999	410	89.5	0.655	0.64	1	2.6	79	10	300.9	2	0	-9	85	1012	3
5	7	23	204	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	88	1012	3
5	7	23	204	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	99.8	999	10	299.9	2	0	-9	88	1013	3
5	7	23	204	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	0
5	7	23	204	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	99.8	999	10	299.2	2	0	-9	91	1013	0
5	7	24	205	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1013	3
5	7	24	205	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1012	0
5	7	24	205	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1011	3
5	7	24	205	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	100	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	24	205	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	97	1011	7
5	7	24	205	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	7
5	7	24	205	7	4.3	-9	-9	-9	63	-999	-99999	0.542	0.56	0.44	0	0	10	300.4	2	0	-9	88	1012	7
5	7	24	205	8	49.2	-9	-9	-9	258	-999	-99999	0.542	0.56	0.23	0	0	10	300.4	2	0	-9	85	1012	7
5	7	24	205	9	92	-9	-9	-9	488	-999	-99999	0.542	0.56	0.18	0	0	10	300.4	2	0	-9	86	1013	7
5	7	24	205	10	126.5	-9	-9	-9	786	-999	-99999	0.542	0.56	0.17	0	0	10	300.4	2	0	-9	88	1013	7
5	7	24	205	11	151.5	-9	-9	-9	1023	-999	-99999	0.542	0.56	0.17	0	0	10	300.9	2	0	-9	85	1012	7
5	7	24	205	12	123.6	0.428	1.561	0.005	1114	643	-57.2	0.37	0.38	0.18	3.1	88	10	300.9	2	0	-9	79	1013	7
5	7	24	205	13	124.8	0.319	1.609	0.005	1207	421	-23.5	0.37	0.38	0.18	2.1	91	10	300.4	2	0	-9	88	1012	7
5	7	24	205	14	54.8	0.762	1.238	0.005	1250	1529	-727.3	0.655	0.64	0.18	5.1	66	10	301.4	2	0	-9	80	1011	10
5	7	24	205	15	48.1	0.269	1.197	0.005	1287	661	-36.5	0.655	0.64	0.18	1.5	56	10	302	2	0	-9	75	1011	10
5	7	24	205	16	26	0.338	0.981	0.005	1307	457	-133.3	0.37	0.38	0.19	2.6	88	10	302	2	0	-9	75	1010	10
5	7	24	205	17	51.2	0.35	1.24	0.005	1345	477	-75.7	0.37	0.38	0.22	2.6	120	10	302	2	0	-9	80	1011	7
5	7	24	205	18	22	-9	-9	-9	1358	-999	-99999	0.542	0.56	0.32	0	0	10	300.4	2	0	-9	82	1010	7
5	7	24	205	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	88	1011	7
5	7	24	205	20	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.9	2	0	-9	91	1011	7
5	7	24	205	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1011	7
5	7	24	205	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1011	7
5	7	24	205	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	91	1012	7
5	7	24	205	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	7
5	7	25	206	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1012	7
5	7	25	206	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	97	1011	7
5	7	25	206	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1011	7
5	7	25	206	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1012	7
5	7	25	206	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1012	7
5	7	25	206	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1012	7
5	7	25	206	7	2.8	-9	-9	-9	60	-999	-99999	0.542	0.56	0.44	0	0	10	297	2	0	-9	94	1012	7
5	7	25	206	8	57.7	0.417	0.72	0.005	233	620	-113.9	0.655	0.64	0.24	2.6	78	10	300.9	2	0	-9	82	1013	0
5	7	25	206	9	84.5	0.417	0.987	0.005	410	619	-77.4	0.37	0.38	0.2	3.1	93	10	302	2	0	-9	80	1013	3
5	7	25	206	10	118.4	0.426	1.294	0.005	662	640	-59	0.37	0.38	0.19	3.1	114	10	304.2	2	0	-9	70	1013	3
5	7	25	206	11	142.5	0.432	1.504	0.005	863	653	-51.1	0.37	0.38	0.19	3.1	107	10	305.4	2	0	-9	66	1012	3
5	7	25	206	12	124.5	0.538	1.486	0.005	953	907	-112.8	0.37	0.38	0.18	4.1	95	10	303.1	2	0	-9	75	1012	7
5	7	25	206	13	157.2	0.489	1.671	0.005	1074	790	-67.3	0.37	0.38	0.18	3.6	96	10	305.4	2	0	-9	66	1012	3
5	7	25	206	14	149.2	0.543	1.699	0.005	1187	919	-96.6	0.37	0.38	0.18	4.1	96	10	305.4	2	0	-9	64	1011	3
5	7	25	206	15	151.6	0.578	1.762	0.005	1302	1009	-114.5	0.655	0.64	0.18	3.6	83	10	305.4	2	0	-9	58	1010	7
5	7	25	206	16	82	0.472	1.458	0.005	1361	754	-115.2	0.37	0.38	0.19	3.6	93	10	304.5	2	0	-9	63	1010	7
5	7	25	206	17	51.9	0.406	1.262	0.005	1398	598	-116.2	0.37	0.38	0.22	3.1	92	10	303.8	2	0	-9	68	1010	7
5	7	25	206	18	17.7	0.332	0.883	0.005	1406	443	-186.8	0.37	0.38	0.34	2.6	99	10	302	2	0	-9	75	1011	3
5	7	25	206	19	-8.5	0.11	-9	-9	-999	144	14.1	0.655	0.64	1	1.5	83	10	300.9	2	0	-9	79	1011	3
5	7	25	206	20	-32	0.317	-9	-9	-999	410	89.5	0.655	0.64	1	2.6	56	10	300.9	2	0	-9	85	1012	3
5	7	25	206	21	-32.1	0.316	-9	-9	-999	410	89.2	0.655	0.64	1	2.6	72	10	300.4	2	0	-9	88	1013	3
5	7	25	206	22	-32.1	0.316	-9	-9	-999	410	89.2	0.655	0.64	1	2.6	78	10	300.4	2	0	-9	88	1013	3
5	7	25	206	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.9	2	0	-9	91	1013	3
5	7	25	206	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1013	3
5	7	26	207	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1012	3
5	7	26	207	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1012	0
5	7	26	207	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	99.8	999	10	298.8	2	0	-9	94	1012	99
5	7	26	207	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	99.8	999	10	298.8	2	0	-9	94	1012	99
5	7	26	207	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	26	207	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	26	207	7	0.1	-9	-9	-9	125	-999	-99999	0.542	0.56	0.44	0	0	10	299.2	2	0	-9	94	1013	3
5	7	26	207	8	63.1	0.487	0.879	0.005	389	781	-164.8	0.655	0.64	0.24	3.1	79	10	302.5	2	0	-9	80	1013	3
5	7	26	207	9	70.3	0.468	1.078	0.005	644	737	-131.6	0.37	0.38	0.2	3.6	97	10	304.2	2	0	-9	70	1013	7
5	7	26	207	10	181.7	0.46	1.724	0.005	1020	718	-48.5	0.686	0.72	0.15	2.6	244	10	298.1	2	0	-9	94	1013	0
5	7	26	207	11	152.5	-9	-9	-9	1173	-999	-99999	0.542	0.56	0.17	0	0	10	302.5	2	0	-9	77	1013	7
5	7	26	207	12	104	0.228	1.54	0.005	1269	251	-10.3	0.265	0.28	0.14	1.5	286	10	299.9	2	0	-9	88	1013	7
5	7	26	207	13	243.9	0.618	2.161	0.005	1497	1118	-87.4	0.736	0.77	0.17	3.6	203	10	297	2	0	-9	100	1013	0
5	7	26	207	14	159	-9	-9	-9	1601	-999	-99999	0.542	0.56	0.16	0	0	10	301.4	2	0	-9	80	1012	7
5	7	26	207	15	106.1	0.438	1.69	0.005	1646	668	-71.6	0.265	0.28	0.14	3.6	253	10	299.2	2	0	-9	88	1012	0
5	7	26	207	16	107.7	-9	-9	-9	1698	-999	-99999	0.542	0.56	0.17	0	0	10	300.9	2	0	-9	74	1012	7
5	7	26	207	17	67.9	-9	-9	-9	1729	-999	-99999	0.542	0.56	0.2	0	0	10	300.9	2	0	-9	79	1011	7
5	7	26	207	18	21.8	-9	-9	-9	1738	-999	-99999	0.542	0.56	0.32	0	0	10	300.4	2	0	-9	82	1012	7
5	7	26	207	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1012	7
5	7	26	207	20	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1013	3
5	7	26	207	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	100	1013	3
5	7	26	207	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1014	3
5	7	26	207	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1014	0
5	7	26	207	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1013	3
5	7	27	208	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1013	3
5	7	27	208	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	-9	97	1012	3
5	7	27	208	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1012	3
5	7	27	208	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1012	3
5	7	27	208	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1012	3
5	7	27	208	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1013	7
5	7	27	208	7	3.5	-9	-9	-9	233	-999	-99999	0.542	0.56	0.44	0	0	10	299.2	2	0	-9	94	1013	7
5	7	27	208	8	50.1	-9	-9	-9	836	-999	-99999	0.542	0.56	0.23	0	0	10	302.5	2	0	-9	77	1013	7
5	7	27	208	9	123	0.439	1.491	0.005	975	670	-62.4	0.655	0.64	0.19	2.6	76	10	304.2	2	0	-9	75	1014	3
5	7	27	208	10	138.7	0.508	1.63	0.006	1130	833	-85.7	0.655	0.64	0.18	3.1	54	10	304.2	2	0	-9	75	1014	7
5	7	27	208	11	142.2	0.541	1.718	0.007	1291	915	-100.7	0.37	0.38	0.19	4.1	89	10	304.2	2	0	-9	68	1013	3
5	7	27	208	12	223.8	0.725	2.079	0.007	1454	1418	-153.7	0.655	0.64	0.18	4.6	51	10	305.4	2	0	-9	58	1013	3
5	7	27	208	13	226.8	0.725	2.128	0.006	1537	1421	-151.9	0.655	0.64	0.18	4.6	65	10	305.9	2	0	-9	54	1012	3
5	7	27	208	14	212.3	0.525	2.111	0.006	1603	913	-61.4	0.655	0.64	0.18	3.1	64	10	305.4	2	0	-9	56	1011	0
5	7	27	208	15	187.5	0.585	2.05	0.005	1660	1028	-96.3	0.655	0.64	0.18	3.6	80	10	305.9	2	0	-9	60	1011	3
5	7	27	208	16	145.3	0.445	1.9	0.005	1704	699	-54.8	0.655	0.64	0.19	2.6	71	10	305.9	2	0	-9	56	1010	3
5	7	27	208	17	62.2	0.522	1.436	0.005	1720	866	-205.7	0.37	0.38	0.22	4.1	89	10	304.2	2	0	-9	61	1011	3
5	7	27	208	18	26.1	0.541	1.077	0.005	1726	914	-546.5	0.655	0.64	0.33	3.6	73	10	303.1	2	0	-9	65	1011	3
5	7	27	208	19	-31.9	0.317	-9	-9	-999	452	90	0.655	0.64	1	2.6	59	10	302	2	0	-9	70	1012	3
5	7	27	208	20	-21.3	0.201	-9	-9	-999	217	34.3	0.655	0.64	1	2.1	74	10	300.4	2	0	-9	82	1012	0
5	7	27	208	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	82	1013	3
5	7	27	208	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	3
5	7	27	208	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	0
5	7	27	208	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	3
5	7	28	209	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	28	209	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	0
5	7	28	209	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	28	209	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	28	209	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	-9	94	1012	3
5	7	28	209	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	28	209	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.44	0	0	10	299.2	2	0	-9	88	1013	3
5	7	28	209	8	53.9	-9	-9	-9	246	-999	-99999	0.542	0.56	0.23	0	0	10	301.4	2	0	-9	80	1013	0
5	7	28	209	9	113.2	-9	-9	-9	442	-999	-99999	0.542	0.56	0.18	0	0	10	302	2	0	-9	85	1014	3
5	7	28	209	10	119.1	0.481	1.291	0.005	653	767	-84.4	0.37	0.38	0.19	3.6	91	10	305.4	2	0	-9	62	1013	3
5	7	28	209	11	205.5	0.655	1.868	0.005	1149	1217	-123.3	0.655	0.64	0.18	4.1	58	10	305.4	2	0	-9	62	1013	3
5	7	28	209	12	224.4	0.725	2.14	0.005	1581	1417	-153.3	0.655	0.64	0.18	4.6	80	10	305.9	2	0	-9	56	1012	3
5	7	28	209	13	157.8	0.49	1.948	0.006	1696	840	-67.1	0.37	0.38	0.18	3.6	102	10	305.9	2	0	-9	56	1012	3
5	7	28	209	14	216.3	0.657	2.225	0.007	1840	1222	-118	0.655	0.64	0.18	4.1	67	10	307	2	0	-9	56	1011	3
5	7	28	209	15	187.6	0.585	2.144	0.007	1897	1036	-96.2	0.655	0.64	0.18	3.6	71	10	305.9	2	0	-9	60	1010	3
5	7	28	209	16	101	0.422	1.754	0.007	1928	651	-66.9	0.37	0.38	0.19	3.1	89	10	305.9	2	0	-9	60	1010	3
5	7	28	209	17	62.7	0.355	1.501	0.007	1947	489	-64.2	0.37	0.38	0.22	2.6	91	10	305.4	2	0	-9	58	1010	3
5	7	28	209	18	17.9	0.447	0.989	0.007	1949	688	-450	0.37	0.38	0.34	3.6	89	10	303.1	2	0	-9	70	1010	3
5	7	28	209	19	-24.9	0.247	-9	-9	-999	312	54.3	0.37	0.38	1	2.6	86	10	300.9	2	0	-9	79	1011	3
5	7	28	209	20	-8.5	0.11	-9	-9	-999	102	14.1	0.655	0.64	1	1.5	85	10	300.9	2	0	-9	82	1011	3
5	7	28	209	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	82	1012	0
5	7	28	209	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	20	10	299.5	2	0	-9	86	1013	99
5	7	28	209	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	91	1013	0
5	7	28	209	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1013	3
5	7	29	210	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	29	210	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	99.8	999	10	298.1	2	0	-9	94	1012	3
5	7	29	210	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	3
5	7	29	210	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	99.8	999	10	297.9	2	0	-9	94	1011	3
5	7	29	210	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	-9	94	1011	3
5	7	29	210	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	29	210	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.44	99.8	999	10	999	2	0	-9	999	1013	3
5	7	29	210	8	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.23	99.8	999	10	300.6	2	0	-9	999	1013	99
5	7	29	210	9	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.18	99.8	999	10	999	2	0	-9	999	1013	99
5	7	29	210	10	118.2	0.372	-9	-9	-999	522	-39.4	0.37	0.38	0.19	2.6	98	10	303.1	2	0	-9	70	1013	3
5	7	29	210	11	115	0.536	-9	-9	-999	901	-120.8	0.37	0.38	0.18	4.1	106	10	303.8	2	0	-9	68	1013	7
5	7	29	210	12	125.8	0.594	-9	-9	-999	1051	-150.2	0.37	0.38	0.18	4.6	133	10	305.4	2	0	-9	62	1012	7
5	7	29	210	13	125.8	0.65	-9	-9	-999	1204	-197	0.37	0.38	0.18	5.1	109	10	302	2	0	-9	80	1012	7
5	7	29	210	14	159.7	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.16	0	0	10	302	2	0	-9	82	1011	7
5	7	29	210	15	150	0.447	-9	-9	-999	686	-53.5	0.655	0.64	0.18	2.6	58	10	302	2	0	-9	81	1011	7
5	7	29	210	16	116.7	0.438	-9	-9	-999	666	-64.7	0.655	0.64	0.19	2.6	40	10	302	2	0	-9	80	1010	7
5	7	29	210	17	73.9	0.424	-9	-9	-999	635	-92.8	0.655	0.64	0.21	2.6	72	10	302.5	2	0	-9	77	1010	7
5	7	29	210	18	23.4	0.253	-9	-9	-999	313	-62.7	0.655	0.64	0.33	1.5	82	10	300.9	2	0	-9	74	1011	7
5	7	29	210	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	82	1011	7
5	7	29	210	20	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	85	1012	7
5	7	29	210	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	88	1013	7
5	7	29	210	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	7
5	7	29	210	23	-19.3	0.24	-9	-9	-999	271	64.7	0.655	0.64	1	2.1	75	10	299.2	2	0	-9	91	1013	7
5	7	29	210	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1013	7
5	7	30	211	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	7
5	7	30	211	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1012	7
5	7	30	211	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	7
5	7	30	211	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	7
5	7	30	211	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	0
5	7	30	211	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	7	30	211	7	-0.5	0.454	-9	-9	-999	705	8888	0.655	0.64	0.45	3.1	68	10	300.4	2	0	-9	88	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	7	30	211	8	57.9	0.553	1.021	0.005	662	944	-262.9	0.655	0.64	0.24	3.6	70	10	302	2	0	-9	80	1012	0
5	7	30	211	9	123.1	0.776	1.402	0.005	809	1569	-342.3	0.655	0.64	0.19	5.1	60	10	304.2	2	0	-9	70	1013	3
5	7	30	211	10	138.9	0.778	1.504	0.005	886	1579	-306.8	0.655	0.64	0.18	5.1	84	10	304.2	2	0	-9	66	1013	7
5	7	30	211	11	115.2	0.592	1.443	0.005	943	1082	-162.1	0.37	0.38	0.18	4.6	91	10	304.2	2	0	-9	68	1012	7
5	7	30	211	12	180.4	0.584	1.727	0.005	1032	1027	-99.4	0.655	0.64	0.18	3.6	80	10	304.2	2	0	-9	70	1012	7
5	7	30	211	13	226.9	0.725	1.942	0.005	1167	1419	-151.7	0.655	0.64	0.18	4.6	83	10	305.4	2	0	-9	66	1011	3
5	7	30	211	14	212.7	0.791	2.048	0.005	1459	1613	-209.3	0.655	0.64	0.18	5.1	85	10	305.4	2	0	-9	62	1010	0
5	7	30	211	15	130.2	0.651	1.792	0.005	1592	1230	-190.6	0.37	0.38	0.19	5.1	91	10	305.4	2	0	-9	62	1009	3
5	7	30	211	16	100.8	0.532	1.661	0.005	1638	908	-134.7	0.37	0.38	0.19	4.1	92	10	305.4	2	0	-9	58	1009	3
5	7	30	211	17	85.5	0.629	1.584	0.005	1677	1147	-262.5	0.655	0.64	0.21	4.1	79	10	304.9	2	0	-9	59	1009	0
5	7	30	211	18	17.7	0.389	0.938	0.005	1681	610	-299.9	0.37	0.38	0.34	3.1	94	10	303.1	2	0	-9	65	1010	3
5	7	30	211	19	-40.8	0.404	-9	-9	-999	591	145.7	0.655	0.64	1	3.1	84	10	300.9	2	0	-9	79	1011	3
5	7	30	211	20	-32	0.317	-9	-9	-999	414	89.5	0.655	0.64	1	2.6	70	10	300.9	2	0	-9	82	1011	3
5	7	30	211	21	-32	0.317	-9	-9	-999	410	89.5	0.655	0.64	1	2.6	61	10	300.9	2	0	-9	79	1011	3
5	7	30	211	22	-8.6	0.11	-9	-9	-999	131	14.1	0.655	0.64	1	1.5	56	10	300.4	2	0	-9	82	1012	3
5	7	30	211	23	-33.3	0.416	-9	-9	-999	616	194.4	0.655	0.64	1	3.1	67	10	299.9	2	0	-9	88	1012	7
5	7	30	211	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1012	7
5	7	31	212	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1011	7
5	7	31	212	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	91	1010	0
5	7	31	212	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1010	7
5	7	31	212	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1010	7
5	7	31	212	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	7
5	7	31	212	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	7
5	7	31	212	7	2.7	-9	-9	-9	21	-999	-99999	0.542	0.56	0.44	0	0	10	298.1	2	0	-9	94	1012	7
5	7	31	212	8	14.6	0.607	0.399	0.005	156	1089	-1383.3	0.655	0.64	0.24	4.1	40	10	297	2	0	-9	100	1013	10
5	7	31	212	9	90.6	-9	-9	-9	406	-999	-99999	0.542	0.56	0.18	0	0	10	297	2	0	-9	100	1013	7
5	7	31	212	10	126	-9	-9	-9	568	-999	-99999	0.542	0.56	0.17	0	0	10	298.1	2	0	-9	94	1012	7
5	7	31	212	11	151	-9	-9	-9	762	-999	-99999	0.542	0.56	0.17	0	0	10	298.1	2	0	-9	94	1012	7
5	7	31	212	12	165.7	-9	-9	-9	905	-999	-99999	0.542	0.56	0.16	0	0	10	300.6	2	0	-9	79	1012	7
5	7	31	212	13	168.8	-9	-9	-9	1035	-999	-99999	0.542	0.56	0.16	0	0	10	303.1	2	0	-9	65	1011	7
5	7	31	212	14	161.4	-9	-9	-9	1160	-999	-99999	0.542	0.56	0.16	0	0	10	304.9	2	0	-9	59	1010	7
5	7	31	212	15	186.2	0.651	1.884	0.006	1296	1209	-133.6	0.655	0.64	0.18	4.1	360	10	303.1	2	0	-9	65	1010	3
5	7	31	212	16	117.4	0.775	1.652	0.008	1384	1564	-356.3	0.655	0.64	0.19	5.1	4	10	303.1	2	0	-9	70	1009	7
5	7	31	212	17	43.3	0.369	1.193	0.007	1413	707	-104.2	0.265	0.28	0.18	3.1	315	10	302	2	0	-9	75	1009	7
5	7	31	212	18	22.2	-9	-9	-9	1430	-999	-99999	0.542	0.56	0.32	0	0	10	302	2	0	-9	75	1009	7
5	7	31	212	19	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	88	1010	7
5	7	31	212	20	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.9	2	0	-9	91	1010	7
5	7	31	212	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1011	7
5	7	31	212	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1011	7
5	7	31	212	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	7
5	7	31	212	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	7
5	8	1	213	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1011	7
5	8	1	213	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	-9	94	1010	0
5	8	1	213	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1010	3
5	8	1	213	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1010	3
5	8	1	213	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	97	1010	0
5	8	1	213	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	94	1011	7
5	8	1	213	7	2.6	-9	-9	-9	188	-999	-99999	0.542	0.56	0.44	0	0	10	298.1	2	0	-9	94	1012	7
5	8	1	213	8	58	-9	-9	-9	646	-999	-99999	0.542	0.56	0.23	0	0	10	301.4	2	0	-9	82	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	1	213	9	122.6	0.571	1.4	0.005	810	992	-137.1	0.655	0.64	0.19	3.6	75	10	303.1	2	0	-9	75	1013	3
5	8	1	213	10	171.1	0.649	1.686	0.005	1013	1200	-144.1	0.655	0.64	0.18	4.1	70	10	304.2	2	0	-9	70	1013	3
5	8	1	213	11	166.4	0.783	1.739	0.005	1142	1591	-260.6	0.655	0.64	0.18	5.1	62	10	304.9	2	0	-9	68	1012	7
5	8	1	213	12	125.6	0.374	1.622	0.005	1229	722	-37.6	0.37	0.38	0.18	2.6	125	10	304.2	2	0	-9	66	1012	7
5	8	1	213	13	157.9	0.436	1.803	0.005	1341	662	-47.2	0.37	0.38	0.18	3.1	139	10	305.4	2	0	-9	66	1011	3
5	8	1	213	14	149.9	0.488	1.818	0.005	1446	783	-69.8	0.37	0.38	0.18	3.6	106	10	305.4	2	0	-9	64	1010	3
5	8	1	213	15	130.3	0.539	1.769	0.005	1530	909	-108	0.37	0.38	0.19	4.1	90	10	305.4	2	0	-9	62	1009	3
5	8	1	213	16	100.8	0.477	1.643	0.005	1587	760	-96.7	0.37	0.38	0.19	3.6	88	10	305.4	2	0	-9	62	1009	3
5	8	1	213	17	61.8	0.409	1.405	0.005	1617	606	-100	0.37	0.38	0.22	3.1	88	10	303.8	2	0	-9	70	1009	3
5	8	1	213	18	25.3	0.401	1.046	0.005	1629	585	-229.9	0.655	0.64	0.33	2.6	84	10	303.1	2	0	-9	65	1010	3
5	8	1	213	19	-8.5	0.11	-9	-9	-999	213	14.1	0.655	0.64	1	1.5	66	10	300.9	2	0	-9	79	1011	3
5	8	1	213	20	-21.3	0.201	-9	-9	-999	208	34.5	0.655	0.64	1	2.1	49	10	300.9	2	0	-9	85	1011	0
5	8	1	213	21	-49.2	0.486	-9	-9	-999	779	210.4	0.655	0.64	1	3.6	56	10	300.4	2	0	-9	88	1012	3
5	8	1	213	22	-32.1	0.316	-9	-9	-999	429	89.2	0.655	0.64	1	2.6	67	10	300.4	2	0	-9	88	1012	3
5	8	1	213	23	-49.5	0.486	-9	-9	-999	778	209	0.655	0.64	1	3.6	48	10	298.8	2	0	-9	88	1013	3
5	8	1	213	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	88	1013	3
5	8	2	214	1	-12.6	0.127	-9	-9	-999	105	14.8	0.37	0.38	1	2.1	92	10	298.1	2	0	-9	94	1012	3
5	8	2	214	2	-26.8	0.332	-9	-9	-999	440	123.4	0.655	0.64	1	2.6	71	10	298.1	2	0	-9	94	1012	7
5	8	2	214	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	3
5	8	2	214	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	3
5	8	2	214	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1010	3
5	8	2	214	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	3
5	8	2	214	7	1.7	0.187	0.104	0.006	24	187	-354.8	0.37	0.38	0.46	1.5	117	10	298.1	2	0	-9	94	1012	7
5	8	2	214	8	14.6	0.68	0.416	0.005	178	1289	-1939.8	0.655	0.64	0.24	4.6	62	10	297	2	0	-9	94	1013	10
5	8	2	214	9	97.6	0.367	0.959	0.005	327	611	-45.6	0.655	0.64	0.19	2.1	18	10	297	2	0	-9	100	1014	7
5	8	2	214	10	126.1	-9	-9	-9	521	-999	-99999	0.542	0.56	0.17	0	0	10	298.1	2	0	-9	94	1014	7
5	8	2	214	11	151.4	-9	-9	-9	756	-999	-99999	0.542	0.56	0.17	0	0	10	298.8	2	0	-9	91	1013	7
5	8	2	214	12	222.9	0.461	1.791	0.005	933	721	-39.8	0.655	0.64	0.18	2.6	83	10	302	2	0	-9	70	1013	3
5	8	2	214	13	182.1	0.868	1.814	0.005	1185	1861	-324.4	0.655	0.64	0.18	5.7	67	10	303.1	2	0	-9	70	1012	7
5	8	2	214	14	173.7	0.649	1.9	0.005	1427	1257	-142	0.655	0.64	0.18	4.1	77	10	304.2	2	0	-9	66	1011	7
5	8	2	214	15	150.9	0.645	1.873	0.005	1572	1192	-159.9	0.655	0.64	0.18	4.1	85	10	303.1	2	0	-9	70	1010	7
5	8	2	214	16	118	0.438	1.749	0.005	1635	704	-64.2	0.655	0.64	0.19	2.6	74	10	304.2	2	0	-9	66	1010	7
5	8	2	214	17	74	0.626	1.508	0.005	1671	1139	-299.2	0.655	0.64	0.21	4.1	79	10	303.1	2	0	-9	70	1010	7
5	8	2	214	18	22.9	0.4	1.021	0.005	1678	626	-251.9	0.655	0.64	0.33	2.6	36	10	300.9	2	0	-9	85	1010	7
5	8	2	214	19	-8.5	0.11	-9	-9	-999	237	14.1	0.655	0.64	1	1.5	65	10	300.4	2	0	-9	88	1011	3
5	8	2	214	20	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.9	2	0	-9	88	1011	0
5	8	2	214	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1012	3
5	8	2	214	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	94	1012	3
5	8	2	214	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	91	1013	3
5	8	2	214	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1013	3
5	8	3	215	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1012	3
5	8	3	215	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1012	7
5	8	3	215	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1011	7
5	8	3	215	4	-7.6	0.11	-9	-9	-999	84	15.8	0.655	0.64	1	1.5	30	10	298.8	2	0	-9	92	1012	7
5	8	3	215	5	-33.5	0.415	-9	-9	-999	616	193.1	0.655	0.64	1	3.1	39	10	298.1	2	0	-9	97	1012	7
5	8	3	215	6	-21.3	0.209	-9	-9	-999	254	38.6	0.655	0.64	1	2.1	81	10	298.1	2	0	-9	94	1012	3
5	8	3	215	7	-5.7	0.524	-9	-9	-999	873	2272.3	0.655	0.64	0.46	3.6	69	10	298.1	2	0	-9	85	1012	3
5	8	3	215	8	38.8	0.29	0.561	0.005	164	406	-56.7	0.37	0.38	0.25	2.1	87	10	298.8	2	0	-9	88	1013	0
5	8	3	215	9	122	0.571	1.074	0.005	367	992	-137.6	0.655	0.64	0.19	3.6	65	10	302	2	0	-9	80	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	3	215	10	170.7	0.867	1.572	0.005	823	1854	-344.2	0.655	0.64	0.18	5.7	49	10	303.1	2	0	-9	75	1012	3
5	8	3	215	11	206	1.011	1.824	0.008	1064	2327	-452.1	0.655	0.64	0.18	6.7	76	10	304.9	2	0	-9	68	1012	3
5	8	3	215	12	225.1	0.592	2.002	0.005	1290	1252	-83.2	0.655	0.64	0.18	3.6	64	10	305.4	2	0	-9	62	1012	3
5	8	3	215	13	203.5	0.822	1.984	0.005	1386	1709	-245.6	0.736	0.77	0.17	5.1	140	10	304.2	2	0	-9	66	1011	7
5	8	3	215	14	172.8	0.452	1.914	0.005	1465	849	-48.1	0.655	0.64	0.18	2.6	79	10	302.5	2	0	-9	75	1010	7
5	8	3	215	15	187.7	0.787	2.01	0.005	1563	1604	-233.7	0.655	0.64	0.18	5.1	60	10	305.4	2	0	-9	58	1010	3
5	8	3	215	16	145	1.003	1.892	0.008	1685	2304	-626.9	0.655	0.64	0.19	6.7	53	10	305.4	2	0	-9	58	1009	3
5	8	3	215	17	84.7	0.853	1.605	0.005	1757	1846	-658.8	0.655	0.64	0.21	5.7	42	10	304.2	2	0	-9	63	1009	0
5	8	3	215	18	24.9	0.755	1.071	0.005	1773	1526	-1553.5	0.655	0.64	0.33	5.1	45	10	303.1	2	0	-9	65	1010	3
5	8	3	215	19	-31.9	0.317	-9	-9	-999	660	89.5	0.655	0.64	1	2.6	64	10	300.9	2	0	-9	79	1010	3
5	8	3	215	20	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	82	1011	0
5	8	3	215	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.4	2	0	-9	82	1012	3
5	8	3	215	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	299.2	2	0	-9	88	1012	3
5	8	3	215	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	2	0	-9	94	1013	0
5	8	3	215	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	8	4	216	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1012	3
5	8	4	216	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	-9	94	1011	3
5	8	4	216	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	3
5	8	4	216	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	2	0	-9	94	1011	3
5	8	4	216	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	2	0	-9	97	1011	3
5	8	4	216	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	2	0	-9	100	1011	3
5	8	4	216	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.45	0	0	10	299.2	2	0	-9	94	1012	3
5	8	4	216	8	57.7	-9	-9	-9	275	-999	-99999	0.542	0.56	0.23	0	0	10	300.9	2	0	-9	85	1012	3
5	8	4	216	9	122.7	0.776	1.405	0.006	818	1571	-343.3	0.655	0.64	0.19	5.1	38	10	303.1	2	0	-9	75	1013	3
5	8	4	216	10	170.8	0.936	1.771	0.005	1176	2076	-433.9	0.655	0.64	0.18	6.2	54	10	303.1	2	0	-9	75	1013	3
5	8	4	216	11	163.6	0.514	1.793	0.007	1274	1055	-75	0.655	0.64	0.18	3.1	47	10	299.2	2	0	-9	82	1013	7
5	8	4	216	12	179.8	0.584	1.905	0.007	1390	1026	-99.7	0.655	0.64	0.18	3.6	48	10	302	2	0	-9	75	1012	7
5	8	4	216	13	121.8	0.275	1.703	0.007	1468	432	-15.4	0.37	0.38	0.18	1.7	124	10	303.5	3	0	0.25	75	1013	7
5	8	4	216	14	97	0.269	1.602	0.007	1531	322	-18	0.37	0.38	0.18	1.7	131	10	304.4	3	0	0	66	1012	8
5	8	4	216	15	13.9	0.185	0.838	0.007	1532	185	-41.3	0.37	0.38	0.19	1.3	87	10	300.6	3	0	3.05	70	1011	10
5	8	4	216	16	9.5	0.166	0.741	0.007	1534	156	-43.3	0.736	0.77	0.18	0.9	149	10	299.8	3	0	0	75	1011	10
5	8	4	216	17	0.8	0.104	0.322	0.007	1534	78	-130.4	0.37	0.38	0.22	0.8	131	10	299.6	3	0	0	85	1012	10
5	8	4	216	18	0.1	0.075	0.162	0.007	1534	47	-378.2	0.37	0.38	0.34	0.6	131	10	299.8	3	0	0	88	1012	10
5	8	4	216	19	-0.9	0.036	-9	-9	-999	16	4.8	0.37	0.38	1	0.6	113	10	299.5	3	0	0	88	1013	7
5	8	4	216	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	299.5	3	0	0	94	1014	7
5	8	4	216	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	299.5	3	0	0	100	1014	7
5	8	4	216	22	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	82	10	299	3	0	0	88	1014	7
5	8	4	216	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298.9	3	0	0	94	1014	7
5	8	4	216	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	71	10	299	3	0	0	94	1013	7
5	8	5	217	1	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	82	10	299.1	3	0	0	88	1013	7
5	8	5	217	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	298.9	3	0	0	91	1012	7
5	8	5	217	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	298.9	3	0	0	94	1012	7
5	8	5	217	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.9	3	0	0	82	1012	7
5	8	5	217	5	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	75	10	298.9	3	0	0	94	1013	7
5	8	5	217	6	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	79	10	299.1	3	0	0	94	1013	7
5	8	5	217	7	-2.2	0.073	-9	-9	-999	46	16.3	0.655	0.64	0.46	1	84	10	300.4	3	0	0	88	1014	0
5	8	5	217	8	44.8	0.215	0.628	0.005	200	229	-20	0.655	0.64	0.24	1.1	84	10	301.6	3	0	0	82	1014	8
5	8	5	217	9	91.7	0.313	1.01	0.005	406	403	-30.2	0.655	0.64	0.19	1.7	79	10	303.1	3	0	0	75	1014	8
5	8	5	217	10	90.4	0.321	1.152	0.005	612	418	-33	0.37	0.38	0.19	2.2	88	10	304.4	3	0	0	66	1014	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	5	217	11	114.8	0.349	1.384	0.005	835	475	-33.6	0.37	0.38	0.18	2.4	102	10	305	3	0	0	63	1014	7
5	8	5	217	12	68.2	0.292	1.195	0.005	904	364	-32.9	0.37	0.38	0.18	2	92	10	304.4	3	0	0	62	1013	9
5	8	5	217	13	72	0.282	1.249	0.005	977	345	-28.2	0.37	0.38	0.18	1.9	93	10	304.4	3	0	0	66	1012	9
5	8	5	217	14	97.3	0.301	1.427	0.005	1078	380	-25.3	0.37	0.38	0.18	2	95	10	305.1	3	0	0	65	1012	8
5	8	5	217	15	119.9	0.386	1.586	0.005	1201	552	-43.4	0.655	0.64	0.18	2.2	84	10	305.1	3	0	0	61	1011	8
5	8	5	217	16	74	0.319	1.382	0.005	1287	417	-39.7	0.655	0.64	0.19	1.8	72	10	304.9	3	0	0	62	1011	9
5	8	5	217	17	24	0.306	0.956	0.005	1312	390	-107.8	0.655	0.64	0.21	1.9	85	10	303.5	3	0	0	63	1011	10
5	8	5	217	18	0.1	0.182	0.154	0.005	1306	186	-5471.7	0.37	0.38	0.34	1.5	87	10	301.8	3	0	0	75	1012	3
5	8	5	217	19	-2.3	0.055	-9	-9	-999	48	6.3	0.37	0.38	1	0.9	93	10	300.5	3	0	0	79	1012	3
5	8	5	217	20	-5.5	0.088	-9	-9	-999	60	11.3	0.655	0.64	1	1.2	79	10	300	3	0	0	82	1013	3
5	8	5	217	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	83	10	299.4	3	0	0	88	1014	3
5	8	5	217	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	299	3	0	0	88	1014	3
5	8	5	217	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	86	10	298.8	3	0	0	91	1014	0
5	8	5	217	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	106	10	298.8	3	0	0	94	1014	3
5	8	6	218	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	298.1	3	0	0	94	1013	3
5	8	6	218	2	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	85	10	298.2	3	0	0	94	1012	0
5	8	6	218	3	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	84	10	298	3	0	0	94	1012	3
5	8	6	218	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297.8	3	0	0	94	1013	3
5	8	6	218	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	297.6	3	0	0	97	1012	3
5	8	6	218	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	298.9	3	0	0	94	1013	7
5	8	6	218	7	-2.1	0.073	-9	-9	-999	46	17	0.655	0.64	0.46	1	79	10	301.6	3	0	0	94	1013	0
5	8	6	218	8	54.6	0.221	0.789	0.005	324	240	-18	0.37	0.38	0.25	1.4	92	10	303.4	3	0	0	77	1014	0
5	8	6	218	9	81.3	0.253	1.12	0.005	626	293	-18	0.37	0.38	0.2	1.6	96	10	304.2	3	0	0	70	1014	6
5	8	6	218	10	120.7	0.274	1.408	0.005	837	330	-15.5	0.37	0.38	0.19	1.7	100	10	305.9	3	0	0	66	1014	3
5	8	6	218	11	122.9	0.275	1.459	0.005	914	331	-15.3	0.37	0.38	0.18	1.7	87	10	306.4	3	0	0	60	1014	7
5	8	6	218	12	177.2	0.334	1.713	0.005	1026	445	-19.1	0.655	0.64	0.18	1.7	83	10	306.8	3	0	0	56	1013	7
5	8	6	218	13	115.7	0.285	1.521	0.005	1100	350	-18	0.37	0.38	0.18	1.8	102	10	306.6	3	0	0	56	1012	8
5	8	6	218	14	110.5	0.305	1.549	0.005	1215	388	-23.2	0.37	0.38	0.18	2	106	10	306.4	3	0	0	56	1011	8
5	8	6	218	15	81.2	0.307	1.429	0.005	1298	392	-32.2	0.37	0.38	0.19	2.1	103	10	305.9	3	0	0	56	1010	8
5	8	6	218	16	52.8	0.286	1.255	0.005	1350	352	-39.9	0.37	0.38	0.19	2	98	10	305.2	3	0	0	58	1010	9
5	8	6	218	17	18	0.232	0.879	0.005	1364	258	-63	0.37	0.38	0.22	1.7	107	10	303.8	3	0	0	63	1011	10
5	8	6	218	18	0.1	0.146	0.156	0.005	1357	131	-2817.9	0.37	0.38	0.34	1.2	94	10	301.9	3	0	0	70	1012	3
5	8	6	218	19	-2.9	0.061	-9	-9	-999	38	7.1	0.37	0.38	1	1	94	10	300.8	3	0	0	79	1012	3
5	8	6	218	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	92	10	300.2	3	0	0	79	1013	3
5	8	6	218	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	299.8	3	0	0	79	1014	3
5	8	6	218	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	99	10	299.2	3	0	0	82	1014	3
5	8	6	218	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	97	10	298.9	3	0	0	91	1014	0
5	8	6	218	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	96	10	298.5	3	0	0	88	1013	3
5	8	7	219	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	47	10	298	3	0	0	94	1013	3
5	8	7	219	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	41	10	297.8	3	0	0	88	1012	0
5	8	7	219	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	58	10	297.8	3	0	0	100	1012	3
5	8	7	219	4	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	56	10	297.6	3	0	0	94	1012	3
5	8	7	219	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	297.4	3	0	0	90	1012	3
5	8	7	219	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	102	10	298.5	3	0	0	94	1013	3
5	8	7	219	7	-0.8	0.044	-9	-9	-999	21	10.1	0.655	0.64	0.46	0.6	80	10	301.6	3	0	0	94	1013	0
5	8	7	219	8	60.4	0.181	0.868	0.005	391	177	-8.9	0.655	0.64	0.24	0.8	84	10	303.2	3	0	0	75	1014	0
5	8	7	219	9	62.8	0.191	1.037	0.005	642	192	-10	0.37	0.38	0.2	1.1	111	10	303.9	3	0	0	70	1014	8
5	8	7	219	10	83.1	0.231	1.198	0.005	748	255	-13.4	0.37	0.38	0.19	1.4	117	10	305	3	0	0	66	1014	8
5	8	7	219	11	141.6	0.29	1.523	0.005	903	359	-15.6	0.37	0.38	0.18	1.8	117	10	306.4	3	0	0	62	1013	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	7	219	12	113.2	0.239	1.472	0.005	1018	270	-10.9	0.37	0.38	0.18	1.4	128	10	306.6	3	0	0	56	1013	8
5	8	7	219	13	78.7	0.157	1.337	0.005	1096	145	-4.4	0.655	0.64	0.18	0.6	49	10	305.1	3	0	0	56	1012	10
5	8	7	219	14	118.2	0.254	1.585	0.005	1215	294	-12.5	0.655	0.64	0.18	1.2	352	10	304.9	3	0	0	58	1011	9
5	8	7	219	15	50.8	0.22	1.213	0.005	1267	237	-18.8	0.37	0.38	0.19	1.4	109	10	305	3	0	0	56	1010	10
5	8	7	219	16	61.6	0.278	1.315	0.005	1331	338	-31.6	0.37	0.38	0.19	1.9	114	10	305.4	3	0	0	58	1010	9
5	8	7	219	17	26.4	0.261	0.998	0.005	1354	306	-60.4	0.37	0.38	0.22	1.9	121	10	304.2	3	0	0	61	1011	9
5	8	7	219	18	0.1	0.17	0.155	0.005	1347	164	-4456.7	0.37	0.38	0.35	1.4	132	10	301.9	3	0	0	65	1012	10
5	8	7	219	19	-2.1	0.055	-9	-9	-999	42	7.1	0.37	0.38	1	0.9	113	10	300.4	3	0	0	79	1012	7
5	8	7	219	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	105	10	300	3	0	0	88	1013	7
5	8	7	219	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	299.9	3	0	0	88	1013	7
5	8	7	219	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	299.4	3	0	0	88	1013	7
5	8	7	219	23	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	114	10	299.1	3	0	0	94	1013	3
5	8	7	219	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	130	10	299.1	3	0	0	94	1013	3
5	8	8	220	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	119	10	298.6	3	0	0	94	1012	3
5	8	8	220	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	90	10	298.4	3	0	0	91	1012	0
5	8	8	220	3	-1	0.038	-9	-9	-999	17	5	0.736	0.77	1	0.5	142	10	298.2	3	0	0	94	1012	3
5	8	8	220	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	128	10	298.8	3	0	0	94	1012	3
5	8	8	220	5	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	124	10	298.6	3	0	0	94	1012	7
5	8	8	220	6	-3.6	0.077	-9	-9	-999	49	11.2	0.736	0.77	1	1	154	10	299.5	3	0	0	94	1013	7
5	8	8	220	7	-6.1	0.169	-9	-9	-999	160	71.2	0.736	0.77	0.46	1.4	160	10	299.4	3	0	0.25	88	1014	0
5	8	8	220	8	24.7	0.169	0.511	0.005	195	159	-17.5	0.736	0.77	0.24	0.8	148	10	298.9	3	0	0.25	82	1014	10
5	8	8	220	9	134.2	0.223	1.346	0.005	657	242	-7.4	0.736	0.77	0.19	0.9	161	10	301.8	3	0	0	88	1015	4
5	8	8	220	10	155.7	-9	-9	-9	883	-999	-99999	0.542	0.56	0.17	0	0	10	304.9	3	0	0	75	1015	4
5	8	8	220	11	136.1	0.29	1.539	0.006	971	359	-16.2	0.686	0.72	0.15	1.4	227	10	304.4	3	0	0	64	1014	9
5	8	8	220	12	98.6	0.332	1.414	0.005	1037	441	-33.7	0.686	0.72	0.15	1.8	229	10	304.9	3	0	0	66	1014	9
5	8	8	220	13	47.8	0.116	1.121	0.005	1067	143	-2.9	0.265	0.28	0.14	0.6	332	10	303.9	3	0	0	88	1013	10
5	8	8	220	14	41	0.226	1.074	0.005	1092	248	-25.5	0.655	0.64	0.18	1.2	13	10	302.5	3	0	0	80	1012	10
5	8	8	220	15	40.9	0.2	1.082	0.005	1119	205	-17.6	0.655	0.64	0.18	1	23	10	302.5	3	0	0	66	1012	10
5	8	8	220	16	44.2	0.215	1.12	0.005	1148	229	-20.2	0.655	0.64	0.19	1.1	22	10	302.8	3	0	0	94	1012	10
5	8	8	220	17	9.1	0.186	0.661	0.005	1152	184	-63.6	0.655	0.64	0.21	1.1	27	10	301.5	3	0	0	77	1012	10
5	8	8	220	18	0.1	0.076	0.147	0.005	1150	55	-391.7	0.655	0.64	0.34	0.5	58	10	300.4	3	0	3.56	80	1013	7
5	8	8	220	19	-1.4	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300	3	0	0	85	1013	3
5	8	8	220	20	-2.9	0.069	-9	-9	-999	42	10.1	0.736	0.77	1	0.9	183	10	299.8	3	0	0	88	1014	7
5	8	8	220	21	-31	0.304	-9	-9	-999	386	82.2	0.686	0.72	1	2.5	222	10	299.5	3	0	0.25	88	1015	3
5	8	8	220	22	-5.2	0.092	-9	-9	-999	122	13.5	0.736	0.77	1	1.2	168	10	298.8	3	0	0	94	1015	7
5	8	8	220	23	-1.2	0.044	-9	-9	-999	29	6.3	0.655	0.64	1	0.6	83	10	297.9	3	0	0	94	1014	7
5	8	8	220	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	297.4	3	0	0	94	1014	7
5	8	9	221	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	120	10	297	3	0	0	94	1013	3
5	8	9	221	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.8	3	0	0	94	1013	3
5	8	9	221	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	113	10	296.5	3	0	0	100	1013	3
5	8	9	221	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	296.4	3	0	0	100	1013	3
5	8	9	221	5	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	106	10	296.4	3	0	0	97	1013	3
5	8	9	221	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	136	10	298.2	3	0	0	94	1014	3
5	8	9	221	7	-0.8	0.042	-9	-9	-999	20	8.7	0.37	0.38	0.47	0.7	137	10	301.8	3	0	0	94	1015	0
5	8	9	221	8	66.6	0.218	1.003	0.005	549	235	-14.1	0.736	0.77	0.24	1	181	10	302.6	3	0	0	85	1015	6
5	8	9	221	9	143.5	0.269	1.507	0.005	865	320	-12.2	0.736	0.77	0.19	1.2	162	10	304.5	3	0	0	75	1015	0
5	8	9	221	10	57.1	0.106	1.139	0.005	938	102	-1.9	0.265	0.28	0.14	0.5	332	10	304.1	3	0	0	70	1015	9
5	8	9	221	11	52.1	0.258	1.13	0.005	1003	302	-29.9	0.655	0.64	0.18	1.4	340	10	303	3	0	0	62	1015	10
5	8	9	221	12	18.2	0.292	0.801	0.005	1023	364	-124.6	0.686	0.72	0.15	1.8	231	10	300.5	3	0	0.51	58	1014	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	9	221	13	30.9	0.167	0.968	0.005	1062	164	-13.6	0.655	0.64	0.18	0.8	346	10	300.6	3	0	0.25	60	1014	10
5	8	9	221	14	61.5	0.223	1.247	0.006	1140	242	-16.2	0.655	0.64	0.18	1.1	23	10	300.4	3	0	1.52	70	1013	10
5	8	9	221	15	56.7	0.193	1.238	0.006	1210	195	-11.5	0.655	0.64	0.18	0.9	15	10	301.8	3	0	0	80	1012	10
5	8	9	221	16	29.2	0.166	0.997	0.006	1224	156	-14.1	0.655	0.64	0.19	0.8	37	10	301.5	3	0	0.51	66	1012	10
5	8	9	221	17	5.3	0.1	0.565	0.006	1226	74	-17.2	0.655	0.64	0.22	0.5	81	10	300.9	3	0	0	70	1013	10
5	8	9	221	18	0.1	-9	-9	-9	1226	-999	-99999	0.542	0.56	0.33	0	0	10	300.2	3	0	0	75	1013	3
5	8	9	221	19	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	117	10	298.9	3	0	0	79	1014	3
5	8	9	221	20	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	134	10	298.8	3	0	0	82	1015	3
5	8	9	221	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	83	10	298.9	3	0	0	82	1015	7
5	8	9	221	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	298.6	3	0	0	88	1015	7
5	8	9	221	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.2	3	0	0	94	1015	3
5	8	9	221	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.2	3	0	0	88	1014	3
5	8	10	222	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	94	1014	3
5	8	10	222	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	297.9	3	0	0	94	1014	3
5	8	10	222	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	113	10	297.9	3	0	0	94	1014	3
5	8	10	222	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	132	10	298	3	0	0	94	1014	3
5	8	10	222	5	-1	0.038	-9	-9	-999	17	4.9	0.736	0.77	1	0.5	144	10	298.1	3	0	0	94	1014	0
5	8	10	222	6	-4.1	0.077	-9	-9	-999	49	10	0.736	0.77	1	1	172	10	299.2	3	0	0	94	1015	3
5	8	10	222	7	-5	0.155	-9	-9	-999	140	66.9	0.736	0.77	0.46	1.3	188	10	301.4	3	0	0	88	1015	0
5	8	10	222	8	70.3	0.316	1.198	0.005	888	409	-40.7	0.736	0.77	0.24	1.7	194	10	302	3	0	0	79	1016	0
5	8	10	222	9	111.7	0.317	1.481	0.006	1055	411	-25.9	0.736	0.77	0.19	1.6	201	10	302.9	3	0	0	80	1016	7
5	8	10	222	10	132.1	0.364	1.614	0.006	1154	504	-33	0.736	0.77	0.18	1.9	204	10	303.6	3	0	0	70	1015	8
5	8	10	222	11	94	0.371	1.47	0.006	1224	520	-49.2	0.686	0.72	0.15	2.1	225	10	304	3	0	0	88	1015	9
5	8	10	222	12	1.9	0.09	0.399	0.006	1222	194	-35.2	0.655	0.64	0.18	0.5	346	10	300.5	3	0	16.26	94	1014	10
5	8	10	222	13	0.1	0.162	0.15	0.006	1219	150	-3844.7	0.655	0.64	0.18	1.1	13	10	296.9	3	0	83.31	94	1014	10
5	8	10	222	14	0.1	0.146	0.15	0.006	1218	129	-2823.6	0.37	0.38	0.18	1.2	102	10	296	3	0	16	94	1014	10
5	8	10	222	15	3.8	0.159	0.507	0.006	1222	146	-94.6	0.37	0.38	0.19	1.2	92	10	297	3	0	0.25	94	1013	10
5	8	10	222	16	20.4	0.159	0.887	0.006	1238	146	-17.8	0.655	0.64	0.19	0.8	63	10	298.2	3	0	0	88	1013	10
5	8	10	222	17	6.5	0.088	0.608	0.006	1244	61	-9.3	0.37	0.38	0.22	0.5	110	10	298.9	3	0	0	72	1013	10
5	8	10	222	18	0.1	0.098	0.151	0.006	1243	71	-858.8	0.37	0.38	0.35	0.8	86	10	298.2	3	0	0	82	1013	7
5	8	10	222	19	-1.3	0.042	-9	-9	-999	21	5.5	0.37	0.38	1	0.7	105	10	297.9	3	0	0	88	1014	7
5	8	10	222	20	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	139	10	297.6	3	0	0	94	1014	0
5	8	10	222	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.8	3	0	0	94	1015	3
5	8	10	222	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.1	3	0	0	94	1015	3
5	8	10	222	23	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	77	10	296.8	3	0	0	90	1015	0
5	8	10	222	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	296.8	3	0	0	94	1014	3
5	8	11	223	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	297	3	0	0	100	1014	3
5	8	11	223	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	296.9	3	0	0	93	1013	3
5	8	11	223	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	100	10	297	3	0	0	97	1013	3
5	8	11	223	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	103	10	297.2	3	0	0	97	1014	3
5	8	11	223	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	3	0	0	97	1014	0
5	8	11	223	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	3	0	0	97	1014	7
5	8	11	223	7	-0.5	0.037	-9	-9	-999	16	8.3	0.655	0.64	0.46	0.5	60	10	301.5	3	0	0	94	1015	0
5	8	11	223	8	52.2	0.175	0.708	0.005	245	169	-9.3	0.37	0.38	0.25	1	107	10	303.2	3	0	0	85	1015	0
5	8	11	223	9	86.9	0.243	1.002	0.005	419	276	-15	0.37	0.38	0.2	1.5	124	10	304.2	3	0	0	75	1016	0
5	8	11	223	10	88	0.232	1.131	0.005	595	258	-12.9	0.37	0.38	0.19	1.4	114	10	304.8	3	0	0	70	1015	8
5	8	11	223	11	107.9	-9	-9	-9	812	-999	-99999	0.542	0.56	0.17	0	0	10	304.8	3	0	0	79	1015	9
5	8	11	223	12	62.3	0.249	1.149	0.005	880	286	-22.5	0.655	0.64	0.18	1.3	346	10	301.9	3	0	1.78	94	1014	10
5	8	11	223	13	6.4	0.155	0.54	0.005	883	143	-52.2	0.655	0.64	0.18	0.9	353	10	298.9	3	0	9.91	79	1014	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	11	223	14	5.1	0.144	0.5	0.005	888	126	-53.5	0.736	0.77	0.17	0.8	199	10	298.6	3	0	9.65	85	1013	10
5	8	11	223	15	35.5	0.141	0.97	0.005	928	122	-7.1	0.655	0.64	0.18	0.6	357	10	299.2	3	0	1.52	88	1013	10
5	8	11	223	16	25.1	0.149	0.873	0.005	957	133	-11.9	0.655	0.64	0.19	0.7	36	10	300.5	3	0	0	82	1012	10
5	8	11	223	17	6.4	0.142	0.555	0.005	962	123	-40.1	0.655	0.64	0.22	0.8	52	10	299.9	3	0	0	85	1013	10
5	8	11	223	18	0.1	0.104	0.139	0.005	961	77	-1018	0.655	0.64	0.34	0.7	65	10	298.9	3	0	0	94	1013	7
5	8	11	223	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	298.5	3	0	0	94	1014	7
5	8	11	223	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	107	10	298.1	3	0	0	97	1014	0
5	8	11	223	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	298	3	0	0	94	1015	7
5	8	11	223	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	297.8	3	0	0	100	1015	7
5	8	11	223	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	110	10	297.5	3	0	0	97	1014	0
5	8	11	223	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	81	10	297.4	3	0	0	100	1014	3
5	8	12	224	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	94	10	297.2	3	0	0	100	1013	3
5	8	12	224	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	66	10	297	3	0	0	94	1013	0
5	8	12	224	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	297	3	0	0	100	1013	3
5	8	12	224	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	296.9	3	0	0	94	1013	3
5	8	12	224	5	-1.5	0.046	-9	-9	-999	23	6	0.736	0.77	1	0.6	144	10	296.9	3	0	0	100	1013	3
5	8	12	224	6	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	147	10	298.9	3	0	0	100	1013	7
5	8	12	224	7	-0.6	0.036	-9	-9	-999	16	7.4	0.37	0.38	0.47	0.6	108	10	301.6	3	0	0	94	1014	0
5	8	12	224	8	59.3	0.154	0.711	0.005	219	139	-5.6	0.37	0.38	0.25	0.8	127	10	303.5	3	0	0	79	1014	0
5	8	12	224	9	86.2	0.186	0.984	0.005	400	185	-6.8	0.37	0.38	0.2	1	130	10	304.6	3	0	0	75	1015	4
5	8	12	224	10	49.8	-9	-9	-9	878	-999	-99999	0.542	0.56	0.17	0	0	10	302.9	3	0	5.33	80	1014	10
5	8	12	224	11	60.6	0.153	1.154	0.005	918	138	-5.4	0.686	0.72	0.15	0.6	231	10	301.6	3	0	0	60	1014	10
5	8	12	224	12	130.2	0.156	1.535	0.005	1006	141	-2.6	0.736	0.77	0.17	0.5	186	10	302.8	3	0	1.27	70	1013	9
5	8	12	224	13	74.9	-9	-9	-9	1056	-999	-99999	0.542	0.56	0.16	0	0	10	302.4	3	0	0	94	1013	10
5	8	12	224	14	80.9	0.216	1.356	0.006	1111	230	-11.2	0.655	0.64	0.18	1	345	10	302.9	3	0	0	72	1012	10
5	8	12	224	15	20.5	0.146	0.862	0.006	1124	129	-13.6	0.655	0.64	0.18	0.7	16	10	301.8	3	0	0	80	1011	10
5	8	12	224	16	25.6	0.15	0.933	0.006	1141	133	-11.8	0.655	0.64	0.19	0.7	22	10	301.5	3	0	0	91	1011	10
5	8	12	224	17	5.5	0.166	0.559	0.006	1144	155	-74.9	0.655	0.64	0.22	1	24	10	301.4	3	0	0	94	1011	10
5	8	12	224	18	0.1	0.133	0.147	0.006	1143	112	-2117.9	0.655	0.64	0.34	0.9	72	10	300.2	3	0	0	94	1012	10
5	8	12	224	19	-2.4	0.059	-9	-9	-999	34	7.5	0.655	0.64	1	0.8	74	10	299.2	3	0	0	94	1012	3
5	8	12	224	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	299	3	0	0	97	1013	0
5	8	12	224	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	298.9	3	0	0	94	1014	3
5	8	12	224	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	78	10	298.5	3	0	0	100	1014	3
5	8	12	224	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	94	10	298.4	3	0	0	97	1013	0
5	8	12	224	24	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	105	10	298.4	3	0	0	94	1013	3
5	8	13	225	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	107	10	297.9	3	0	0	100	1012	3
5	8	13	225	2	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	102	10	297.9	3	0	0	97	1012	0
5	8	13	225	3	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	112	10	297.9	3	0	0	100	1012	3
5	8	13	225	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	298.2	3	0	0	100	1012	3
5	8	13	225	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	82	10	297.4	3	0	0	94	1012	0
5	8	13	225	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	298.6	3	0	0	94	1012	3
5	8	13	225	7	-1.6	0.061	-9	-9	-999	34	12.3	0.37	0.38	0.47	1	97	10	301.8	3	0	0	94	1013	0
5	8	13	225	8	45.4	0.206	0.686	0.005	256	216	-17.5	0.37	0.38	0.25	1.3	123	10	303.4	3	0	0	85	1013	0
5	8	13	225	9	86.1	0.243	1.04	0.005	472	276	-15.1	0.37	0.38	0.2	1.5	128	10	304.4	3	0	0	75	1013	4
5	8	13	225	10	13.8	0.24	0.577	0.005	501	270	-90.1	0.736	0.77	0.18	1.4	166	10	300	3	0	9.91	91	1014	10
5	8	13	225	11	19	0.164	0.66	0.005	545	154	-20.8	0.736	0.77	0.17	0.8	153	10	298.4	3	0	22.35	85	1014	10
5	8	13	225	12	62.1	0.217	1.064	0.005	700	232	-14.9	0.736	0.77	0.17	1	154	10	299.9	3	0	0	88	1013	10
5	8	13	225	13	85	0.186	1.247	0.005	824	185	-6.8	0.37	0.38	0.18	1	124	10	302.4	3	0	0	82	1012	9
5	8	13	225	14	73.1	0.206	1.211	0.005	876	215	-10.7	0.37	0.38	0.18	1.2	138	10	304.1	3	0	0	77	1011	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	13	225	15	33.2	0.247	0.938	0.005	896	283	-41.1	0.655	0.64	0.18	1.4	345	10	301.8	3	0	0	70	1010	10
5	8	13	225	16	18.6	0.171	0.777	0.005	909	164	-24.3	0.655	0.64	0.19	0.9	9	10	301.8	3	0	0	70	1010	10
5	8	13	225	17	11	0.123	0.654	0.005	917	99	-15.2	0.655	0.64	0.22	0.6	35	10	301.9	3	0	0	72	1010	10
5	8	13	225	18	0.1	0.087	0.137	0.005	916	59	-583.6	0.37	0.38	0.35	0.7	98	10	301.1	3	0	0	77	1010	7
5	8	13	225	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	82	10	300	3	0	0	82	1011	7
5	8	13	225	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	299.2	3	0	0	88	1012	7
5	8	13	225	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	298.6	3	0	0	88	1013	7
5	8	13	225	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	298.4	3	0	0	88	1013	7
5	8	13	225	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	105	10	298	3	0	0	91	1013	7
5	8	13	225	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	107	10	298	3	0	0	94	1013	7
5	8	14	226	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298	3	0	0	100	1012	7
5	8	14	226	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	73	10	297.9	3	0	0	94	1012	7
5	8	14	226	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297.4	3	0	0	100	1012	7
5	8	14	226	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	80	10	297.2	3	0	0	94	1012	7
5	8	14	226	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	297.2	3	0	0	94	1012	7
5	8	14	226	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	100	10	298.1	3	0	0	94	1012	3
5	8	14	226	7	-0.8	0.042	-9	-9	-999	20	8.5	0.37	0.38	0.47	0.7	89	10	301.4	3	0	0	94	1013	0
5	8	14	226	8	54.6	0.21	0.688	0.005	216	221	-15.3	0.37	0.38	0.25	1.3	110	10	303.4	3	0	0	88	1014	0
5	8	14	226	9	86	0.243	0.996	0.005	416	275	-15.1	0.37	0.38	0.2	1.5	114	10	304.5	3	0	0	75	1014	2
5	8	14	226	10	109.5	0.249	1.284	0.005	699	286	-12.8	0.37	0.38	0.19	1.5	107	10	305.4	3	0	0	70	1014	6
5	8	14	226	11	112.8	0.239	1.5	0.006	1082	269	-11	0.37	0.38	0.18	1.4	100	10	306.2	3	0	0	64	1013	7
5	8	14	226	12	118.1	0.252	1.556	0.007	1154	290	-12.2	0.37	0.38	0.18	1.5	91	10	306.4	3	0	0	56	1012	8
5	8	14	226	13	129.7	0.265	1.642	0.006	1234	314	-13	0.37	0.38	0.18	1.6	88	10	307	3	0	0	60	1011	7
5	8	14	226	14	101.8	0.292	1.54	0.006	1295	363	-22	0.37	0.38	0.18	1.9	95	10	306.5	3	0	0	56	1011	8
5	8	14	226	15	43.1	0.347	1.162	0.006	1314	469	-87.1	0.37	0.38	0.19	2.6	118	10	301.6	3	0	5.59	62	1012	10
5	8	14	226	16	4	0.136	0.527	0.006	1310	160	-56.9	0.655	0.64	0.19	0.8	77	10	297.8	3	0	0	94	1011	10
5	8	14	226	17	0.1	0.075	0.154	0.006	1311	51	-378.1	0.37	0.38	0.22	0.6	103	10	298	3	0	0	88	1012	10
5	8	14	226	18	0.1	0.087	0.154	0.006	1311	59	-584.5	0.37	0.38	0.35	0.7	110	10	298	3	0	0	88	1012	7
5	8	14	226	19	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	58	10	297.9	3	0	0	94	1013	7
5	8	14	226	20	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	68	10	297.9	3	0	0	97	1013	0
5	8	14	226	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	100	1014	7
5	8	14	226	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	58	10	297.9	3	0	0	79	1014	7
5	8	14	226	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	73	10	297.9	3	0	0	90	1014	3
5	8	14	226	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	297.4	3	0	0	94	1013	3
5	8	15	227	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	297.8	3	0	0	100	1013	3
5	8	15	227	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	108	10	297.9	3	0	0	97	1012	7
5	8	15	227	3	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	169	10	297.8	3	0	0	95	1013	7
5	8	15	227	4	-3.3	0.069	-9	-9	-999	42	9	0.736	0.77	1	0.9	173	10	297.6	3	0	0	94	1013	3
5	8	15	227	5	-3.6	0.077	-9	-9	-999	49	11.2	0.736	0.77	1	1	167	10	297.4	3	0	0.51	100	1014	7
5	8	15	227	6	-1.3	0.046	-9	-9	-999	23	6.7	0.736	0.77	1	0.6	140	10	297.4	3	0	0.25	94	1014	7
5	8	15	227	7	-1.2	0.051	-9	-9	-999	27	10.5	0.655	0.64	0.46	0.7	66	10	298.4	3	0	0	100	1014	0
5	8	15	227	8	60.7	0.262	0.577	0.006	115	309	-26.8	0.655	0.64	0.24	1.4	72	10	300.8	3	0	0	91	1015	0
5	8	15	227	9	65.5	0.237	0.756	0.006	239	265	-18.3	0.37	0.38	0.2	1.5	98	10	301.5	3	0	0	88	1015	7
5	8	15	227	10	124.3	0.308	1.177	0.006	476	394	-21.4	0.37	0.38	0.19	2	116	10	302.9	3	0	0	88	1015	0
5	8	15	227	11	121.5	0.297	1.333	0.006	706	372	-19.5	0.37	0.38	0.18	1.9	108	10	302.9	3	0	0	85	1015	7
5	8	15	227	12	148.4	0.368	1.52	0.005	857	514	-30.4	0.37	0.38	0.18	2.5	113	10	304.1	3	0	0	79	1014	5
5	8	15	227	13	124.6	0.309	1.474	0.005	930	396	-21.3	0.37	0.38	0.18	2	109	10	304	3	0	0	75	1013	7
5	8	15	227	14	89.2	0.299	1.344	0.005	983	376	-27	0.37	0.38	0.18	2	105	10	303.6	3	0	0	72	1012	9
5	8	15	227	15	66.3	0.248	1.233	0.005	1022	285	-20.7	0.37	0.38	0.19	1.6	97	10	303.4	3	0	0	88	1012	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	15	227	16	20.6	0.202	0.839	0.005	1032	210	-36.2	0.37	0.38	0.19	1.4	104	10	302.4	3	0	0	88	1012	10
5	8	15	227	17	5	0.184	0.524	0.005	1033	181	-111.7	0.37	0.38	0.22	1.4	115	10	301.4	3	0	0	88	1012	10
5	8	15	227	18	0.1	0.134	0.142	0.005	1032	113	-2180.4	0.37	0.38	0.36	1.1	117	10	300.5	3	0	0	88	1013	7
5	8	15	227	19	-1.6	0.049	-9	-9	-999	29	6.3	0.37	0.38	1	0.8	92	10	299.9	3	0	0	88	1013	7
5	8	15	227	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	64	10	299.4	3	0	0	82	1014	7
5	8	15	227	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	298.9	3	0	0	88	1014	7
5	8	15	227	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	111	10	298.6	3	0	0	88	1014	7
5	8	15	227	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	298.5	3	0	0	94	1014	7
5	8	15	227	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	298.2	3	0	0	94	1014	7
5	8	16	228	1	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	298.1	3	0	0	94	1013	7
5	8	16	228	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	92	10	297.9	3	0	0	97	1013	7
5	8	16	228	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	70	10	297.8	3	0	0	100	1012	7
5	8	16	228	4	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	297.9	3	0	0	100	1013	7
5	8	16	228	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	297.8	3	0	0	94	1013	7
5	8	16	228	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	298.5	3	0	0	94	1013	7
5	8	16	228	7	-1.1	0.049	-9	-9	-999	25	9.4	0.37	0.38	0.47	0.8	92	10	300.4	3	0	0	94	1014	0
5	8	16	228	8	44.6	0.183	0.468	0.006	83	181	-12.5	0.37	0.38	0.25	1.1	103	10	302.4	3	0	0	85	1014	4
5	8	16	228	9	83.7	0.276	0.822	0.006	240	333	-22.6	0.37	0.38	0.2	1.8	131	10	304.2	3	0	0	75	1014	5
5	8	16	228	10	173	0.346	1.393	0.005	565	467	-21.6	0.736	0.77	0.18	1.7	147	10	305.1	3	0	0	70	1014	6
5	8	16	228	11	39.5	0.274	0.885	0.005	634	332	-47.1	0.736	0.77	0.17	1.5	200	10	302.5	3	0	0	66	1013	10
5	8	16	228	12	60.3	0.246	1.077	0.005	749	280	-22.2	0.37	0.38	0.18	1.6	125	10	303.4	3	0	0	60	1013	10
5	8	16	228	13	30.1	0.198	0.876	0.005	804	203	-23.3	0.37	0.38	0.18	1.3	139	10	303.5	3	0	2.54	70	1012	10
5	8	16	228	14	6.5	-9	-9	-9	806	-999	-99999	0.542	0.56	0.16	0	0	10	299.9	3	0	4.57	77	1012	10
5	8	16	228	15	5.1	0.113	0.485	0.005	810	87	-25.7	0.655	0.64	0.18	0.6	56	10	299.8	3	0	1.52	80	1011	10
5	8	16	228	16	10.7	0.109	0.624	0.005	820	82	-10.9	0.655	0.64	0.19	0.5	73	10	300.4	3	0	0	80	1010	10
5	8	16	228	17	6.9	0.117	0.542	0.005	826	92	-20.6	0.655	0.64	0.22	0.6	67	10	300.9	3	0	0	80	1011	10
5	8	16	228	18	0.1	0.104	0.132	0.005	825	77	-1016	0.655	0.64	0.35	0.7	73	10	300.1	3	0	0	85	1011	7
5	8	16	228	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	299.5	3	0	0	85	1012	7
5	8	16	228	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	299.2	3	0	0	85	1013	7
5	8	16	228	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	298.9	3	0	0	94	1013	7
5	8	16	228	22	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	104	10	298.4	3	0	0	88	1014	7
5	8	16	228	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	95	10	298.1	3	0	0	91	1014	7
5	8	16	228	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	72	10	297.9	3	0	0	94	1013	7
5	8	17	229	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.4	3	0	0	94	1013	7
5	8	17	229	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	297	3	0	0	94	1012	7
5	8	17	229	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	80	10	296.9	3	0	0	94	1012	3
5	8	17	229	4	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	74	10	296.9	3	0	0	94	1012	3
5	8	17	229	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	81	10	296.9	3	0	0	97	1012	3
5	8	17	229	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	298.6	3	0	0	94	1013	7
5	8	17	229	7	-1.3	0.055	-9	-9	-999	29	11.2	0.37	0.38	0.47	0.9	116	10	302	3	0	0	94	1013	0
5	8	17	229	8	58.2	0.266	0.93	0.005	500	316	-29.3	0.37	0.38	0.25	1.8	133	10	303.4	3	0	0	85	1013	0
5	8	17	229	9	96.9	0.312	1.292	0.008	806	401	-28.3	0.37	0.38	0.2	2.1	131	10	304.4	3	0	0	75	1013	0
5	8	17	229	10	113.2	0.261	1.428	0.009	930	308	-14.2	0.37	0.38	0.19	1.6	136	10	305.5	3	0	0	70	1013	5
5	8	17	229	11	170.3	0.359	1.696	0.008	1036	495	-24.5	0.736	0.77	0.17	1.8	141	10	305.9	3	0	0	62	1012	8
5	8	17	229	12	172.7	0.359	1.758	0.007	1137	496	-24.3	0.736	0.77	0.17	1.8	142	10	306.2	3	0	0	60	1012	8
5	8	17	229	13	162.8	0.398	1.748	0.006	1185	577	-34.9	0.736	0.77	0.17	2.1	141	10	306.4	3	0	0	62	1011	8
5	8	17	229	14	100.5	0.313	1.499	0.005	1208	406	-27.5	0.37	0.38	0.18	2.1	139	10	306.4	3	0	0	62	1010	8
5	8	17	229	15	70.1	0.282	1.335	0.005	1225	344	-28.7	0.37	0.38	0.19	1.9	134	10	306.1	3	0	0	56	1009	9
5	8	17	229	16	35.3	0.256	1.066	0.005	1236	297	-42.6	0.37	0.38	0.19	1.8	114	10	304.9	3	0	0	58	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	17	229	17	4.4	0.205	0.533	0.005	1235	214	-175.6	0.37	0.38	0.23	1.6	116	10	302.9	3	0	0	61	1010	10
5	8	17	229	18	0.1	0.182	0.151	0.005	1233	179	-5466.3	0.37	0.38	0.36	1.5	117	10	301.4	3	0	0	75	1010	3
5	8	17	229	19	-2.9	0.061	-9	-9	-999	47	7.1	0.37	0.38	1	1	104	10	300.2	3	0	0	79	1011	3
5	8	17	229	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	299.9	3	0	0	79	1012	3
5	8	17	229	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	299.4	3	0	0	82	1013	3
5	8	17	229	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	298.9	3	0	0	88	1014	3
5	8	17	229	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	298.6	3	0	0	88	1014	3
5	8	17	229	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	298.2	3	0	0	94	1013	3
5	8	18	230	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	298	3	0	0	94	1013	3
5	8	18	230	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.6	3	0	0	94	1013	3
5	8	18	230	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	297.4	3	0	0	100	1012	3
5	8	18	230	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	71	10	297.2	3	0	0	94	1012	3
5	8	18	230	5	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	111	10	297.4	3	0	0	97	1013	3
5	8	18	230	6	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	95	10	298.6	3	0	0	100	1013	7
5	8	18	230	7	-1	0.049	-9	-9	-999	25	9.9	0.37	0.38	0.47	0.8	112	10	302	3	0	0	94	1014	0
5	8	18	230	8	54.8	0.243	0.781	0.005	315	275	-23.7	0.37	0.38	0.25	1.6	111	10	303.5	3	0	0	85	1014	0
5	8	18	230	9	83.7	0.319	1.095	0.005	567	415	-35.1	0.37	0.38	0.2	2.2	125	10	304.2	3	0	0	75	1014	5
5	8	18	230	10	78.1	0.273	1.201	0.005	803	329	-23.7	0.37	0.38	0.19	1.8	127	10	304.9	3	0	0	61	1014	8
5	8	18	230	11	120.2	0.308	1.498	0.005	1012	392	-21.9	0.37	0.38	0.18	2	135	10	305.9	3	0	0	58	1014	7
5	8	18	230	12	137	0.322	1.642	0.005	1170	421	-22.1	0.37	0.38	0.18	2.1	127	10	306.6	3	0	0	56	1014	6
5	8	18	230	13	116.9	0.307	1.587	0.005	1236	391	-22.3	0.37	0.38	0.18	2	113	10	306.5	3	0	0	56	1013	8
5	8	18	230	14	83.9	0.265	1.439	0.005	1282	314	-20	0.37	0.38	0.18	1.7	114	10	305.9	3	0	0	54	1012	9
5	8	18	230	15	67.3	0.27	1.35	0.005	1320	322	-26.3	0.37	0.38	0.19	1.8	112	10	305.5	3	0	0	56	1011	9
5	8	18	230	16	30.2	0.242	1.037	0.005	1335	273	-42.2	0.37	0.38	0.19	1.7	108	10	304.4	3	0	0	58	1011	10
5	8	18	230	17	3.9	0.182	0.526	0.005	1333	179	-137.1	0.37	0.38	0.23	1.4	114	10	301.8	3	0	0	65	1012	10
5	8	18	230	18	0.1	0.122	0.155	0.005	1332	99	-1645.2	0.37	0.38	0.36	1	113	10	301	3	0	0	70	1012	7
5	8	18	230	19	-1.6	0.049	-9	-9	-999	27	6.3	0.37	0.38	1	0.8	106	10	300.1	3	0	0	74	1013	7
5	8	18	230	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	104	10	299.8	3	0	0	82	1013	0
5	8	18	230	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	299.4	3	0	0	82	1014	7
5	8	18	230	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	298.9	3	0	0	82	1014	7
5	8	18	230	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	81	10	298.6	3	0	0	85	1015	3
5	8	18	230	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	298.4	3	0	0	94	1014	3
5	8	19	231	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	298.1	3	0	0	94	1014	3
5	8	19	231	2	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	298	3	0	0	94	1013	7
5	8	19	231	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	70	10	298	3	0	0	94	1013	3
5	8	19	231	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	298.1	3	0	0	94	1014	3
5	8	19	231	5	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	95	10	297.9	3	0	0	94	1014	3
5	8	19	231	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	298.6	3	0	0	94	1014	3
5	8	19	231	7	0.5	0.069	0.068	0.005	22	41	-58.6	0.37	0.38	0.47	0.5	120	10	298.9	3	0	0	94	1015	9
5	8	19	231	8	11	0.116	0.359	0.005	152	91	-12.9	0.37	0.38	0.25	0.7	94	10	299.4	3	0	0	94	1016	10
5	8	19	231	9	87.5	0.21	1.029	0.005	452	221	-9.6	0.37	0.38	0.2	1.2	94	10	302.4	3	0	0	85	1016	0
5	8	19	231	10	73.8	0.261	1.129	0.005	707	307	-21.9	0.37	0.38	0.19	1.7	121	10	303.6	3	0	0	85	1016	8
5	8	19	231	11	15	0.219	0.678	0.005	751	236	-63.1	0.37	0.38	0.18	1.6	101	10	300.2	3	0	0	85	1016	10
5	8	19	231	12	31.1	0.177	0.897	0.005	840	171	-16	0.37	0.38	0.18	1.1	93	10	299.4	3	0	0	88	1015	10
5	8	19	231	13	73.2	0.213	1.267	0.006	1006	226	-12	0.655	0.64	0.18	1	70	10	301.9	3	0	0	94	1015	10
5	8	19	231	14	30.3	0.187	0.965	0.006	1071	187	-19.6	0.37	0.38	0.18	1.2	102	10	300.9	3	0	0.51	85	1014	10
5	8	19	231	15	58.6	0.221	1.231	0.005	1153	240	-16.8	0.655	0.64	0.18	1.1	81	10	301.9	3	0	0	80	1013	10
5	8	19	231	16	40.6	0.182	1.095	0.005	1169	178	-13.3	0.37	0.38	0.19	1.1	89	10	302.9	3	0	0	80	1013	9
5	8	19	231	17	11.3	0.193	0.715	0.005	1173	195	-57.6	0.37	0.38	0.23	1.4	92	10	302.1	3	0	0	77	1013	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	19	231	18	0.1	0.098	0.148	0.005	1172	74	-858.8	0.37	0.38	0.36	0.8	93	10	300.9	3	0	0	85	1013	7
5	8	19	231	19	-1.2	0.042	-9	-9	-999	21	5.5	0.37	0.38	1	0.7	110	10	299.9	3	0	0	88	1014	7
5	8	19	231	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	91	10	299.5	3	0	0	91	1015	0
5	8	19	231	21	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	99	10	299	3	0	0	88	1015	0
5	8	19	231	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	298.9	3	0	0	88	1016	7
5	8	19	231	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	63	10	298.4	3	0	0	94	1016	7
5	8	19	231	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	66	10	298.1	3	0	0	94	1015	3
5	8	20	232	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	90	10	298	3	0	0	100	1015	3
5	8	20	232	2	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	98	10	297.8	3	0	0	100	1014	3
5	8	20	232	3	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	90	10	297.6	3	0	0	100	1014	7
5	8	20	232	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	92	10	297.5	3	0	0	100	1014	3
5	8	20	232	5	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	108	10	297.4	3	0	0	97	1014	0
5	8	20	232	6	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	120	10	298.4	3	0	0	100	1015	3
5	8	20	232	7	-0.6	0.036	-9	-9	-999	16	7.4	0.37	0.38	0.47	0.6	119	10	301.9	3	0	0	100	1015	0
5	8	20	232	8	58.4	0.178	0.99	0.005	601	172	-8.7	0.37	0.38	0.25	1	111	10	303.9	3	0	0	80	1016	0
5	8	20	232	9	80.4	0.196	1.191	0.005	763	200	-8.5	0.37	0.38	0.2	1.1	117	10	304.9	3	0	0	70	1016	6
5	8	20	232	10	77.9	0.218	1.23	0.005	867	235	-12.1	0.37	0.38	0.19	1.3	121	10	304.5	3	0	0	82	1016	8
5	8	20	232	11	136.3	0.168	1.56	0.005	1011	159	-3.2	0.655	0.64	0.18	0.6	7	10	305	3	0	0	70	1016	8
5	8	20	232	12	137.1	0.174	1.635	0.005	1155	167	-3.5	0.736	0.77	0.17	0.6	153	10	304.1	3	0	0.25	58	1015	9
5	8	20	232	13	172.8	-9	-9	-9	1356	-999	-99999	0.542	0.56	0.16	0	0	10	306.6	3	0	0	60	1013	7
5	8	20	232	14	129.8	0.167	1.754	0.005	1504	157	-3.2	0.655	0.64	0.18	0.6	353	10	306	3	0	0	58	1013	8
5	8	20	232	15	88.8	0.272	1.576	0.005	1593	327	-20.5	0.655	0.64	0.18	1.4	349	10	304.4	3	0	0	58	1012	9
5	8	20	232	16	64.5	0.25	1.442	0.005	1680	288	-21.9	0.655	0.64	0.19	1.3	341	10	304	3	0	0	58	1012	9
5	8	20	232	17	14.9	0.167	0.889	0.005	1696	159	-28.3	0.655	0.64	0.22	0.9	348	10	302.9	3	0	0	58	1012	10
5	8	20	232	18	0.1	-9	-9	-9	1691	-999	-99999	0.542	0.56	0.35	0	0	10	301.8	3	0	0	65	1013	3
5	8	20	232	19	-0.5	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	300.9	3	0	0	75	1013	3
5	8	20	232	20	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	110	10	300.1	3	0	0	85	1013	0
5	8	20	232	21	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	106	10	299.8	3	0	0	79	1014	3
5	8	20	232	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	127	10	299.5	3	0	0	88	1014	3
5	8	20	232	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	105	10	298.9	3	0	0	91	1014	0
5	8	20	232	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	298.8	3	0	0	94	1014	3
5	8	21	233	1	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	42	10	298.9	3	0	0	94	1013	3
5	8	21	233	2	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	57	10	298.4	3	0	0	94	1012	3
5	8	21	233	3	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	74	10	298.2	3	0	0	100	1012	3
5	8	21	233	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	92	10	297.9	3	0	0	94	1012	3
5	8	21	233	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	297.9	3	0	0	94	1012	7
5	8	21	233	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	298.6	3	0	0	94	1013	7
5	8	21	233	7	-1.4	0.059	-9	-9	-999	33	13.2	0.655	0.64	0.46	0.8	65	10	301.4	3	0	0	91	1013	0
5	8	21	233	8	77.6	0.186	0.886	0.005	324	185	-7.5	0.655	0.64	0.24	0.8	51	10	303.9	3	0	0	88	1013	0
5	8	21	233	9	131.4	0.199	1.324	0.005	639	204	-5.4	0.655	0.64	0.19	0.8	85	10	305.5	3	0	0	70	1014	0
5	8	21	233	10	169.1	0.206	1.626	0.005	920	215	-4.7	0.655	0.64	0.18	0.8	83	10	306.8	3	0	0	62	1014	5
5	8	21	233	11	191.5	0.21	1.812	0.005	1125	221	-4.3	0.655	0.64	0.18	0.8	352	10	306.8	3	0	0	62	1013	6
5	8	21	233	12	178.4	0.348	1.865	0.005	1314	472	-21.3	0.655	0.64	0.18	1.8	338	10	305.8	3	0	0	56	1012	7
5	8	21	233	13	74.2	0.306	1.418	0.005	1387	391	-35	0.655	0.64	0.18	1.7	354	10	303.6	3	0	0	75	1011	10
5	8	21	233	14	15.8	-9	-9	-9	1399	-999	-99999	0.542	0.56	0.16	0	0	10	301.8	3	0	0	56	1010	10
5	8	21	233	15	4.8	0.15	0.571	0.005	1399	134	-63.8	0.37	0.38	0.19	1.1	129	10	299.9	3	0	1.02	65	1010	10
5	8	21	233	16	23.2	0.172	0.971	0.005	1422	164	-19.7	0.37	0.38	0.19	1.1	137	10	299.2	3	0	0	82	1009	10
5	8	21	233	17	20.6	0.159	0.939	0.005	1451	145	-17.5	0.37	0.38	0.23	1	89	10	301.5	3	0	0	77	1009	10
5	8	21	233	18	0.1	0.104	0.159	0.005	1445	78	-1014.4	0.655	0.64	0.36	0.7	64	10	299.9	3	0	0	77	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	21	233	19	-2.1	0.055	-9	-9	-999	30	7.1	0.37	0.38	1	0.9	108	10	299	3	0	0	82	1010	7
5	8	21	233	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	103	10	298.8	3	0	0	91	1010	7
5	8	21	233	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	104	10	298.6	3	0	0	88	1011	7
5	8	21	233	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	298.5	3	0	0	94	1012	7
5	8	21	233	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	108	10	298.4	3	0	0	94	1012	0
5	8	21	233	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	298	3	0	0	94	1011	7
5	8	22	234	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	297.9	3	0	0	94	1010	7
5	8	22	234	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	99	10	297.8	3	0	0	94	1010	0
5	8	22	234	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	297.5	3	0	0	94	1010	7
5	8	22	234	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	297.5	3	0	0	94	1010	7
5	8	22	234	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	86	10	297.5	3	0	0	100	1010	0
5	8	22	234	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	298.9	3	0	0	94	1010	3
5	8	22	234	7	-0.6	0.036	-9	-9	-999	16	7.6	0.37	0.38	0.47	0.6	118	10	302.4	3	0	0	94	1012	0
5	8	22	234	8	66.7	0.156	0.752	0.005	230	142	-5.2	0.37	0.38	0.25	0.8	100	10	304.2	3	0	0	85	1012	0
5	8	22	234	9	59.4	-9	-9	-9	360	-999	-99999	0.542	0.56	0.18	0	0	10	304	3	0	0.51	65	1012	9
5	8	22	234	10	69.9	0.186	1.013	0.005	537	185	-8.4	0.686	0.72	0.15	0.8	234	10	300.9	3	0	5.33	66	1012	10
5	8	22	234	11	161.5	-9	-9	-9	909	-999	-99999	0.542	0.56	0.17	0	0	10	304.9	3	0	0	60	1012	7
5	8	22	234	12	40	0.261	1.013	0.005	937	306	-40	0.736	0.77	0.17	1.4	186	10	299.9	3	0	0.76	62	1011	10
5	8	22	234	13	83.4	-9	-9	-9	1011	-999	-99999	0.542	0.56	0.16	0	0	10	302.8	3	0	0	94	1010	9
5	8	22	234	14	23.3	0.214	0.872	0.005	1027	228	-38	0.655	0.64	0.18	1.2	75	10	299.9	3	0	0	94	1010	10
5	8	22	234	15	33.7	0.156	0.996	0.005	1055	142	-10.1	0.37	0.38	0.19	0.9	88	10	299.9	3	0	0.25	94	1009	10
5	8	22	234	16	41.7	0.2	1.082	0.005	1093	206	-17.3	0.655	0.64	0.19	1	62	10	301.6	3	0	0	94	1008	10
5	8	22	234	17	12.2	0.14	0.721	0.005	1103	121	-20.2	0.37	0.38	0.23	0.9	95	10	301.5	3	0	0	80	1008	10
5	8	22	234	18	0.1	0.104	0.145	0.005	1100	77	-1013.7	0.655	0.64	0.36	0.7	80	10	299.9	3	0	0	85	1009	7
5	8	22	234	19	-0.9	0.036	-9	-9	-999	18	4.8	0.37	0.38	1	0.6	94	10	299.4	3	0	0	94	1009	7
5	8	22	234	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	299.4	3	0	0	91	1010	7
5	8	22	234	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	299	3	0	0	88	1010	7
5	8	22	234	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	298.5	3	0	0	92	1011	7
5	8	22	234	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	93	10	298.4	3	0	0	97	1010	7
5	8	22	234	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	80	10	298.1	3	0	0	94	1010	3
5	8	23	235	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	96	10	297.9	3	0	0	94	1010	3
5	8	23	235	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	297.9	3	0	0	94	1010	3
5	8	23	235	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	91	10	297.9	3	0	0	100	1010	3
5	8	23	235	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	92	10	297.8	3	0	0	94	1010	3
5	8	23	235	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	108	10	297.5	3	0	0	97	1010	0
5	8	23	235	6	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	114	10	298	3	0	0	94	1011	3
5	8	23	235	7	-1.7	0.061	-9	-9	-999	34	11.9	0.37	0.38	0.47	1	126	10	300.5	3	0	0	88	1012	0
5	8	23	235	8	85.9	0.309	0.936	0.005	344	395	-31	0.736	0.77	0.24	1.6	144	10	302.9	3	0	0	82	1012	0
5	8	23	235	9	151.4	0.341	1.56	0.005	906	458	-23.6	0.736	0.77	0.19	1.7	146	10	304.4	3	0	0	80	1012	0
5	8	23	235	10	177.2	0.333	1.773	0.005	1138	442	-18.8	0.736	0.77	0.18	1.6	149	10	305.4	3	0	0	70	1012	6
5	8	23	235	11	122.3	0.25	1.635	0.005	1293	290	-11.5	0.736	0.77	0.17	1.1	141	10	303.1	3	0	1.27	64	1012	9
5	8	23	235	12	135.3	0.282	1.767	0.005	1472	344	-14.9	0.736	0.77	0.17	1.3	203	10	304.4	3	0	0	62	1011	9
5	8	23	235	13	188.9	0.349	2.028	0.006	1595	474	-20.3	0.736	0.77	0.17	1.7	149	10	306.4	3	0	0	62	1010	8
5	8	23	235	14	117.6	0.387	1.75	0.006	1643	553	-44.2	0.736	0.77	0.17	2.1	140	10	305	3	0	0	58	1010	9
5	8	23	235	15	78.6	0.306	1.541	0.006	1678	393	-32.9	0.37	0.38	0.19	2.1	133	10	305.9	3	0	0	56	1009	8
5	8	23	235	16	41.6	0.259	1.251	0.005	1695	304	-37.6	0.37	0.38	0.19	1.8	128	10	305.4	3	0	0	56	1010	9
5	8	23	235	17	3.2	0.203	0.532	0.005	1692	210	-233.9	0.37	0.38	0.23	1.6	114	10	302.9	3	0	0	61	1010	10
5	8	23	235	18	0.1	0.122	0.168	0.005	1689	100	-1643.1	0.37	0.38	0.37	1	110	10	301.2	3	0	0	75	1010	3
5	8	23	235	19	-1.8	0.049	-9	-9	-999	27	5.6	0.37	0.38	1	0.8	98	10	300.4	3	0	0	79	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	23	235	20	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	63	10	299.9	3	0	0	79	1012	3
5	8	23	235	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	44	10	299.4	3	0	0	88	1013	3
5	8	23	235	22	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	30	10	299	3	0	0	82	1013	3
5	8	23	235	23	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	64	10	298.9	3	0	0	82	1013	3
5	8	23	235	24	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	94	10	298.9	3	0	0	88	1012	3
5	8	24	236	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	109	10	298.8	3	0	0	94	1011	3
5	8	24	236	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	298.2	3	0	0	88	1011	3
5	8	24	236	3	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	87	10	298.4	3	0	0	94	1011	3
5	8	24	236	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	297.9	3	0	0	94	1012	3
5	8	24	236	5	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	297.6	3	0	0	94	1012	3
5	8	24	236	6	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	113	10	298.4	3	0	0	94	1013	7
5	8	24	236	7	-1.9	0.069	-9	-9	-999	42	15.5	0.736	0.77	0.46	0.9	146	10	300.4	3	0	0	94	1013	0
5	8	24	236	8	58.3	0.266	0.75	0.005	261	316	-29.2	0.37	0.38	0.25	1.8	139	10	303.5	3	0	0	94	1014	0
5	8	24	236	9	93.4	0.333	1.072	0.005	476	442	-35.7	0.37	0.38	0.2	2.3	137	10	304.9	3	0	0	75	1014	0
5	8	24	236	10	106.9	0.326	1.268	0.005	690	427	-29.2	0.37	0.38	0.19	2.2	133	10	305.1	3	0	0	70	1014	6
5	8	24	236	11	202.4	0.393	1.769	0.006	991	567	-27.2	0.736	0.77	0.17	2	162	10	305.9	3	0	0	68	1014	6
5	8	24	236	12	148.7	0.313	1.691	0.006	1177	406	-18.6	0.736	0.77	0.17	1.5	180	10	303.4	3	0	2.79	70	1013	9
5	8	24	236	13	148.3	0.27	1.738	0.006	1281	323	-12	0.736	0.77	0.17	1.2	154	10	302.6	3	0	0.25	62	1013	9
5	8	24	236	14	79.5	0.307	1.422	0.005	1308	390	-32.7	0.37	0.38	0.18	2.1	121	10	304.4	3	0	0	61	1012	9
5	8	24	236	15	33.2	0.265	1.066	0.005	1316	315	-50.6	0.37	0.38	0.19	1.9	116	10	302	3	0	0	66	1012	10
5	8	24	236	16	31.5	0.242	1.05	0.005	1326	275	-40.8	0.37	0.38	0.19	1.7	116	10	301.8	3	0	0	65	1012	10
5	8	24	236	17	2.2	0.177	0.435	0.005	1325	173	-225.4	0.37	0.38	0.23	1.4	123	10	300.4	3	0	0	77	1012	10
5	8	24	236	18	0.1	0.146	0.155	0.005	1325	129	-2817.9	0.37	0.38	0.37	1.2	112	10	299.9	3	0	0	79	1012	7
5	8	24	236	19	-3.1	0.067	-9	-9	-999	42	8.7	0.37	0.38	1	1.1	111	10	299.5	3	0	0	82	1012	7
5	8	24	236	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	73	10	299.1	3	0	0	88	1013	7
5	8	24	236	21	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	95	10	298.9	3	0	0	82	1014	7
5	8	24	236	22	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	298.8	3	0	0	88	1014	7
5	8	24	236	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	93	10	298.8	3	0	0	85	1014	7
5	8	24	236	24	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	90	10	298.5	3	0	0	88	1014	7
5	8	25	237	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.6	3	0	0	94	1014	7
5	8	25	237	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	298.2	3	0	0	94	1013	7
5	8	25	237	3	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	113	10	298	3	0	0	94	1013	7
5	8	25	237	4	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	134	10	297.9	3	0	0	94	1014	7
5	8	25	237	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	110	10	297.8	3	0	0	94	1014	7
5	8	25	237	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	299.4	3	0	0	94	1014	7
5	8	25	237	7	30.5	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.45	0	0	10	302.5	3	0	0	88	1014	0
5	8	25	237	8	63.1	0.179	1.129	0.007	825	174	-8.2	0.37	0.38	0.25	1	111	10	303.9	3	0	0	77	1014	0
5	8	25	237	9	87.8	0.198	1.282	0.006	868	203	-8	0.37	0.38	0.2	1.1	133	10	305.1	3	0	0	75	1014	4
5	8	25	237	10	101.1	-9	-9	-9	918	-999	-99999	0.542	0.56	0.17	0	0	10	305.2	3	0	0	62	1014	8
5	8	25	237	11	48.7	0.147	1.083	0.005	941	130	-5.9	0.655	0.64	0.18	0.6	355	10	303.5	3	0	0	62	1014	10
5	8	25	237	12	68.5	0.252	1.227	0.005	975	291	-21.1	0.655	0.64	0.18	1.3	349	10	303.1	3	0	0	60	1013	10
5	8	25	237	13	14.1	0.171	0.726	0.005	981	164	-31.8	0.265	0.28	0.14	1.3	253	10	301.1	3	0	22.35	56	1012	10
5	8	25	237	14	0.1	0.162	0.14	0.005	978	150	-3835.8	0.655	0.64	0.18	1.1	32	10	297	3	0	15.49	72	1012	10
5	8	25	237	15	7.7	0.156	0.596	0.005	982	141	-43.9	0.37	0.38	0.19	1.1	113	10	297.4	3	0	1.78	88	1012	10
5	8	25	237	16	7.9	0.156	0.6	0.005	986	142	-43.3	0.37	0.38	0.19	1.1	114	10	298.2	3	0	0.51	88	1012	10
5	8	25	237	17	1.5	0.13	0.343	0.005	987	108	-134.5	0.37	0.38	0.23	1	101	10	298.2	3	0	0	70	1012	10
5	8	25	237	18	0.1	0.11	0.14	0.005	987	84	-1208.1	0.37	0.38	0.37	0.9	90	10	297.9	3	0	0	74	1012	3
5	8	25	237	19	-1.8	0.049	-9	-9	-999	26	5.6	0.37	0.38	1	0.8	100	10	297.6	3	0	0	82	1012	3
5	8	25	237	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	88	10	297.9	3	0	0	91	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	25	237	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	70	10	297.5	3	0	0	88	1013	3
5	8	25	237	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	297.6	3	0	0	94	1013	3
5	8	25	237	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	93	10	297.5	3	0	0	88	1013	0
5	8	25	237	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	297.4	3	0	0	94	1012	3
5	8	26	238	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	108	10	297.4	3	0	0	100	1012	3
5	8	26	238	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	116	10	297	3	0	0	97	1011	0
5	8	26	238	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	109	10	297	3	0	0	97	1011	3
5	8	26	238	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	121	10	297	3	0	0	97	1011	3
5	8	26	238	5	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	138	10	297.4	3	0	0	93	1011	0
5	8	26	238	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	102	10	298.6	3	0	0	97	1012	3
5	8	26	238	7	-0.8	0.042	-9	-9	-999	20	8.8	0.37	0.38	0.47	0.7	126	10	301.6	3	0	0	94	1012	0
5	8	26	238	8	60.8	0.143	0.989	0.005	575	124	-4.3	0.37	0.38	0.25	0.7	132	10	303.9	3	0	0	79	1013	0
5	8	26	238	9	111	0.17	1.384	0.005	865	161	-4	0.736	0.77	0.19	0.6	144	10	304.6	3	0	0	75	1013	7
5	8	26	238	10	115.7	0.211	1.455	0.005	964	222	-7.3	0.655	0.64	0.18	0.9	340	10	304.4	3	0	0	70	1013	8
5	8	26	238	11	37	0.166	1.007	0.005	995	155	-11.1	0.265	0.28	0.14	1.1	329	10	303.5	3	0	0	64	1013	10
5	8	26	238	12	36.6	0.276	1.013	0.005	1024	333	-51.7	0.655	0.64	0.18	1.6	344	10	301.2	3	0	13.97	64	1012	10
5	8	26	238	13	171.9	0.283	1.774	0.005	1174	346	-11.9	0.686	0.72	0.15	1.3	235	10	303.9	3	0	0	62	1011	8
5	8	26	238	14	51.9	0.151	1.206	0.005	1219	144	-5.9	0.265	0.28	0.14	0.9	326	10	303.9	3	0	0	82	1010	9
5	8	26	238	15	31.7	-9	-9	-9	1245	-999	-99999	0.542	0.56	0.17	0	0	10	303.4	3	0	0	75	1010	10
5	8	26	238	16	17.3	0.162	0.845	0.005	1259	150	-22.2	0.736	0.77	0.18	0.8	168	10	302.8	3	0	0	65	1010	10
5	8	26	238	17	3.8	0.141	0.51	0.005	1258	122	-66.5	0.736	0.77	0.22	0.8	146	10	300.8	3	0	0.51	70	1010	10
5	8	26	238	18	0.1	0.063	0.152	0.005	1256	39	-229	0.37	0.38	0.38	0.5	110	10	299.4	3	0	0	75	1010	3
5	8	26	238	19	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	105	10	298.6	3	0	0	79	1010	3
5	8	26	238	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	298.5	3	0	0	91	1011	3
5	8	26	238	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	108	10	298.8	3	0	0	94	1012	3
5	8	26	238	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	112	10	298.5	3	0	0	94	1012	3
5	8	26	238	23	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	298.2	3	0	0	91	1012	3
5	8	26	238	24	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	85	10	297.9	3	0	0	94	1011	0
5	8	27	239	1	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	71	10	297.5	3	0	0	94	1010	0
5	8	27	239	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	94	10	297.4	3	0	0	97	1010	0
5	8	27	239	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	97	10	297.5	3	0	0	97	1010	3
5	8	27	239	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	98	10	297.6	3	0	0	97	1010	3
5	8	27	239	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	297.4	3	0	0	90	1010	3
5	8	27	239	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	298.8	3	0	0	97	1011	3
5	8	27	239	7	-1	0.049	-9	-9	-999	25	10.2	0.37	0.38	0.47	0.8	106	10	302	3	0	0	94	1012	0
5	8	27	239	8	64.3	0.168	0.752	0.005	239	159	-6.7	0.37	0.38	0.25	0.9	110	10	303.9	3	0	0	79	1012	0
5	8	27	239	9	53.9	0.164	0.816	0.005	364	153	-7.4	0.37	0.38	0.2	0.9	114	10	303.1	3	0	0.76	70	1013	8
5	8	27	239	10	147.2	0.158	1.425	0.005	710	144	-2.4	0.736	0.77	0.18	0.5	159	10	305.2	3	0	0	70	1012	7
5	8	27	239	11	52.3	0.105	1.05	0.005	798	79	-2	0.265	0.28	0.14	0.5	294	10	305	3	0	0	60	1012	9
5	8	27	239	12	24.4	0.159	0.823	0.005	824	146	-14.8	0.265	0.28	0.14	1.1	282	10	303.6	3	0	0.51	60	1011	10
5	8	27	239	13	88.4	0.246	1.311	0.005	921	280	-15.2	0.655	0.64	0.18	1.2	11	10	303.2	3	0	0	62	1010	9
5	8	27	239	14	28.9	0.138	0.912	0.005	948	122	-8.1	0.655	0.64	0.18	0.6	38	10	300.2	3	0	19.56	62	1009	10
5	8	27	239	15	37.4	-9	-9	-9	991	-999	-99999	0.542	0.56	0.17	0	0	10	301.4	3	0	0	70	1009	10
5	8	27	239	16	18	0.157	0.796	0.005	1009	143	-19.4	0.655	0.64	0.19	0.8	40	10	300.6	3	0	0	79	1009	10
5	8	27	239	17	5.2	0.126	0.527	0.005	1015	103	-35	0.655	0.64	0.22	0.7	75	10	300.9	3	0	0	63	1009	10
5	8	27	239	18	0.1	0.09	0.141	0.005	1014	62	-651.6	0.655	0.64	0.37	0.6	47	10	300.2	3	0	0	70	1009	3
5	8	27	239	19	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	89	10	299.5	3	0	0	74	1010	3
5	8	27	239	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	81	10	299	3	0	0	77	1010	0
5	8	27	239	21	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	64	10	298.5	3	0	0	77	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	27	239	22	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	105	10	298.4	3	0	0	88	1012	3
5	8	27	239	23	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	91	10	298	3	0	0	91	1011	0
5	8	27	239	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	115	10	297.8	3	0	0	94	1011	3
5	8	28	240	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	61	10	297.5	3	0	0	94	1010	3
5	8	28	240	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	83	10	297.2	3	0	0	97	1010	3
5	8	28	240	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	92	10	297.2	3	0	0	100	1010	3
5	8	28	240	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	128	10	297	3	0	0	94	1011	3
5	8	28	240	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.2	3	0	0	97	1011	0
5	8	28	240	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.6	3	0	0	94	1012	3
5	8	28	240	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.45	0	0	10	302.4	3	0	0	88	1012	0
5	8	28	240	8	88.2	0.323	0.891	0.005	290	422	-34.4	0.736	0.77	0.24	1.7	146	10	303.4	3	0	0	80	1013	0
5	8	28	240	9	126.4	0.307	1.27	0.005	587	391	-20.7	0.736	0.77	0.19	1.5	140	10	304.2	3	0	0	75	1013	6
5	8	28	240	10	115.9	0.262	1.374	0.005	810	309	-14	0.37	0.38	0.19	1.6	138	10	305.9	3	0	0	66	1013	5
5	8	28	240	11	188.9	0.307	1.715	0.005	966	391	-13.8	0.736	0.77	0.17	1.4	158	10	306.5	3	0	0	64	1012	7
5	8	28	240	12	132.6	0.323	1.58	0.005	1075	421	-22.8	0.736	0.77	0.17	1.6	156	10	306.2	3	0	0	60	1011	9
5	8	28	240	13	134.5	0.309	1.641	0.005	1186	395	-19.8	0.736	0.77	0.17	1.5	164	10	306.1	3	0	0	56	1010	9
5	8	28	240	14	193.7	0.308	1.935	0.005	1350	393	-13.6	0.736	0.77	0.17	1.4	140	10	307.5	3	0	0	62	1009	7
5	8	28	240	15	22.6	0.227	0.948	0.005	1354	250	-46.3	0.655	0.64	0.18	1.3	30	10	302.2	3	0	5.84	62	1009	10
5	8	28	240	16	32.8	0.195	1.08	0.005	1380	198	-20.3	0.655	0.64	0.19	1	28	10	301.8	3	0	0	75	1009	10
5	8	28	240	17	3.9	0.136	0.533	0.005	1383	116	-57.9	0.655	0.64	0.22	0.8	64	10	301.8	3	0	0	66	1009	10
5	8	28	240	18	0.1	0.11	0.157	0.005	1381	84	-1204.9	0.37	0.38	0.38	0.9	88	10	301	3	0	0	75	1009	3
5	8	28	240	19	-1.8	0.049	-9	-9	-999	26	5.6	0.37	0.38	1	0.8	100	10	300.4	3	0	0	79	1010	3
5	8	28	240	20	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	82	10	299.9	3	0	0	79	1010	3
5	8	28	240	21	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	84	10	299.4	3	0	0	82	1011	3
5	8	28	240	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	75	10	298.9	3	0	0	82	1011	3
5	8	28	240	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.9	3	0	0	88	1011	0
5	8	28	240	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	70	10	298.8	3	0	0	88	1010	3
5	8	29	241	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.2	3	0	0	88	1010	3
5	8	29	241	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	91	1010	3
5	8	29	241	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	94	1011	3
5	8	29	241	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	120	10	297.9	3	0	0	94	1011	3
5	8	29	241	5	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	128	10	298	3	0	0	97	1012	3
5	8	29	241	6	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	106	10	298.8	3	0	0	94	1012	7
5	8	29	241	7	-1.7	0.061	-9	-9	-999	34	12.2	0.37	0.38	0.46	1	89	10	300.4	3	0	0	88	1013	0
5	8	29	241	8	53.4	0.21	0.699	0.005	231	221	-15.6	0.37	0.38	0.25	1.3	105	10	302.8	3	0	0	82	1013	0
5	8	29	241	9	91	0.278	1.039	0.005	446	337	-21.3	0.37	0.38	0.2	1.8	128	10	304.9	3	0	0	70	1014	0
5	8	29	241	10	122.1	0.275	1.254	0.005	585	331	-15.3	0.37	0.38	0.19	1.7	137	10	305.9	3	0	0	66	1013	4
5	8	29	241	11	209.6	0.408	1.776	0.005	967	600	-29.4	0.736	0.77	0.17	2.1	140	10	304.8	3	0	0	68	1013	6
5	8	29	241	12	134	0.3	1.6	0.005	1104	384	-18.2	0.37	0.38	0.18	1.9	122	10	305.5	3	0	0	60	1012	7
5	8	29	241	13	192.5	0.336	1.905	0.005	1299	448	-17.8	0.736	0.77	0.17	1.6	152	10	305.8	3	0	0	60	1011	7
5	8	29	241	14	46.8	0.136	1.203	0.005	1343	153	-4.8	0.736	0.77	0.17	0.5	206	10	304.4	3	0	0	60	1010	10
5	8	29	241	15	33.1	-9	-9	-9	1372	-999	-99999	0.542	0.56	0.17	0	0	10	302.9	3	0	0	62	1010	10
5	8	29	241	16	31.3	0.253	1.07	0.005	1408	293	-46.7	0.37	0.38	0.19	1.8	119	10	304.4	3	0	0	62	1010	10
5	8	29	241	17	3.1	0.18	0.493	0.005	1406	176	-170.5	0.37	0.38	0.23	1.4	115	10	302.6	3	0	0	68	1010	10
5	8	29	241	18	0.1	0.122	0.158	0.005	1401	99	-1643.1	0.37	0.38	0.38	1	108	10	301.1	3	0	0	75	1010	7
5	8	29	241	19	-2.1	0.055	-9	-9	-999	31	7.1	0.37	0.38	1	0.9	117	10	300.5	3	0	0	79	1011	7
5	8	29	241	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	106	10	300	3	0	0	79	1012	7
5	8	29	241	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	299.8	3	0	0	79	1012	7
5	8	29	241	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	299.6	3	0	0	79	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	29	241	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	299.4	3	0	0	88	1012	7
5	8	29	241	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	299.4	3	0	0	88	1011	7
5	8	30	242	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	3	0	0	88	1011	7
5	8	30	242	2	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	111	10	298.5	3	0	0	91	1010	7
5	8	30	242	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.2	3	0	0	88	1011	7
5	8	30	242	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298	3	0	0	94	1011	7
5	8	30	242	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	135	10	298.1	3	0	0	97	1012	7
5	8	30	242	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	107	10	298.9	3	0	0	94	1012	3
5	8	30	242	7	2.8	0.091	0.166	0.005	58	63	-24	0.37	0.38	0.46	0.6	92	10	299.8	3	0	0	88	1013	8
5	8	30	242	8	21.6	0.16	0.446	0.005	148	147	-17	0.37	0.38	0.25	1	113	10	300.4	3	0	0	88	1014	9
5	8	30	242	9	59.8	0.244	0.77	0.005	276	276	-21.8	0.736	0.77	0.19	1.2	142	10	301.5	3	0	0	77	1014	9
5	8	30	242	10	25.3	0.206	0.614	0.005	330	215	-31.1	0.37	0.38	0.19	1.4	139	10	301.1	3	0	0	82	1014	10
5	8	30	242	11	61.8	0.202	0.925	0.005	462	209	-12	0.37	0.38	0.18	1.2	100	10	301.1	3	0	0	85	1014	9
5	8	30	242	12	136	0.209	1.42	0.005	761	220	-6.1	0.37	0.38	0.18	1.1	112	10	304.4	3	0	0	75	1013	6
5	8	30	242	13	113	0.147	1.396	0.005	870	131	-2.6	0.655	0.64	0.18	0.5	71	10	305	3	0	0	61	1012	9
5	8	30	242	14	75.6	0.146	1.248	0.005	927	129	-3.7	0.265	0.28	0.14	0.8	332	10	304.9	3	0	0	60	1011	9
5	8	30	242	15	63.6	0.152	1.198	0.005	975	136	-5	0.655	0.64	0.18	0.6	29	10	304.4	3	0	0	60	1010	10
5	8	30	242	16	12.5	0.184	0.699	0.005	984	181	-44.6	0.37	0.38	0.19	1.3	110	10	303.9	3	0	0	66	1010	10
5	8	30	242	17	6.9	0.143	0.573	0.005	988	125	-38.8	0.37	0.38	0.23	1	118	10	303.2	3	0	0	63	1011	10
5	8	30	242	18	0.1	0.122	0.14	0.005	985	98	-1644.1	0.37	0.38	0.39	1	110	10	301.2	3	0	0	71	1011	7
5	8	30	242	19	-2.9	0.061	-9	-9	-999	35	7.1	0.37	0.38	1	1	112	10	300.2	3	0	0	79	1012	3
5	8	30	242	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	101	10	299.8	3	0	0	85	1012	7
5	8	30	242	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	105	10	299.1	3	0	0	94	1012	3
5	8	30	242	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	298.9	3	0	0	94	1012	3
5	8	30	242	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	298.8	3	0	0	94	1012	3
5	8	30	242	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	110	10	298.4	3	0	0	94	1012	3
5	8	31	243	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	298.2	3	0	0	94	1011	3
5	8	31	243	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	298.4	3	0	0	94	1010	3
5	8	31	243	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	298.4	3	0	0	94	1010	3
5	8	31	243	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	104	10	298.2	3	0	0	100	1010	3
5	8	31	243	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	70	10	298.2	3	0	0	94	1010	3
5	8	31	243	6	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	89	10	299	3	0	0	94	1011	3
5	8	31	243	7	-1.6	0.061	-9	-9	-999	34	12.9	0.37	0.38	0.46	1	88	10	301.6	3	0	0	88	1012	0
5	8	31	243	8	56.2	0.265	0.968	0.005	582	315	-30	0.37	0.38	0.25	1.8	100	10	303.8	3	0	0	77	1012	0
5	8	31	243	9	86.6	0.287	1.266	0.005	847	354	-24.6	0.37	0.38	0.2	1.9	102	10	305	3	0	0	70	1012	5
5	8	31	243	10	114.8	0.317	1.448	0.005	955	410	-25	0.37	0.38	0.19	2.1	107	10	306	3	0	0	60	1012	6
5	8	31	243	11	127.8	0.32	1.561	0.005	1075	417	-23.2	0.37	0.38	0.18	2.1	113	10	306	3	0	0	62	1012	6
5	8	31	243	12	111.1	0.294	1.536	0.005	1177	368	-20.7	0.37	0.38	0.18	1.9	102	10	304.9	3	0	1.27	62	1011	8
5	8	31	243	13	85	0.276	1.436	0.005	1257	334	-22.3	0.37	0.38	0.18	1.8	124	10	305.4	3	0	0	60	1010	9
5	8	31	243	14	105.4	0.314	1.583	0.005	1358	405	-26.5	0.37	0.38	0.18	2.1	107	10	306.1	3	0	0	60	1009	8
5	8	31	243	15	68.6	0.303	1.394	0.005	1421	384	-36.6	0.37	0.38	0.19	2.1	108	10	305.8	3	0	0	60	1009	9
5	8	31	243	16	40.2	0.269	1.176	0.005	1457	321	-43.6	0.37	0.38	0.19	1.9	109	10	304.9	3	0	0	59	1009	9
5	8	31	243	17	12.8	0.228	0.805	0.005	1465	250	-82.6	0.37	0.38	0.23	1.7	105	10	303.4	3	0	0	66	1009	10
5	8	31	243	18	4.5	-9	-9	-9	1463	-999	-99999	0.37	0.38	0.39	0.8	106	10	300.9	3	0	0	73	1009	99
5	8	31	243	19	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	78	10	300.5	3	0	0	80	1010	3
5	8	31	243	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	300.1	3	0	0	80	1011	3
5	8	31	243	21	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	101	10	299.8	3	0	0	79	1012	0
5	8	31	243	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	299.8	3	0	0	79	1012	3
5	8	31	243	23	-5	0.085	-9	-9	-999	57	11.1	0.37	0.38	1	1.4	134	10	299	3	0	11.68	88	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	8	31	243	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	297.1	3	0	0.25	88	1012	7
5	9	1	244	1	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	51	10	296.9	3	0	0	94	1011	3
5	9	1	244	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	75	10	297	3	0	0	94	1010	7
5	9	1	244	3	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	97	10	297.1	3	0	0	100	1010	7
5	9	1	244	4	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	119	10	297	3	0	0	100	1010	7
5	9	1	244	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	107	10	297.2	3	0	0	97	1010	7
5	9	1	244	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	297.8	3	0	0	94	1011	7
5	9	1	244	7	-0.9	0.049	-9	-9	-999	25	11.4	0.562	0.7	0.46	0.7	76	10	301.9	3	0	0	94	1012	0
5	9	1	244	8	38.9	0.177	0.599	0.005	199	172	-12.9	0.562	0.7	0.24	0.9	77	10	302	3	0	1.78	94	1013	9
5	9	1	244	9	2.2	0.153	0.232	0.005	202	138	-146.9	0.212	0.48	0.19	1.4	135	10	298.9	3	0	11.18	80	1013	10
5	9	1	244	10	15.5	0.182	0.462	0.005	229	178	-35	0.212	0.48	0.18	1.5	93	10	298.4	3	0	0.76	94	1013	10
5	9	1	244	11	32.3	0.184	0.634	0.005	285	181	-17.3	0.212	0.48	0.18	1.4	94	10	299.2	3	0	0	91	1013	10
5	9	1	244	12	144.4	0.195	1.314	0.005	568	198	-4.6	0.212	0.48	0.18	1.2	111	10	303.2	3	0	0.25	80	1012	7
5	9	1	244	13	145.6	0.235	1.533	0.005	893	263	-8.1	0.212	0.48	0.18	1.6	111	10	305.5	3	0	0	75	1010	7
5	9	1	244	14	89	0.213	1.338	0.005	971	227	-9.8	0.212	0.48	0.18	1.5	110	10	305.5	3	0	0	72	1010	9
5	9	1	244	15	62.8	0.234	1.214	0.005	1025	261	-18.4	0.212	0.48	0.18	1.8	112	10	304.4	3	0	0	66	1009	9
5	9	1	244	16	31.1	0.202	0.968	0.005	1051	209	-23.8	0.212	0.48	0.19	1.6	119	10	304	3	0	0	70	1009	10
5	9	1	244	17	7.9	0.173	0.613	0.005	1055	166	-59.8	0.212	0.48	0.23	1.5	104	10	302.6	3	0	0	68	1009	10
5	9	1	244	18	0.1	0.105	0.143	0.005	1053	79	-1035.7	0.212	0.48	0.39	1	110	10	301.1	3	0	0	80	1010	3
5	9	1	244	19	-2.3	0.052	-9	-9	-999	28	5.6	0.212	0.48	1	1	110	10	300.2	3	0	0	85	1010	3
5	9	1	244	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	109	10	299.9	3	0	0	88	1011	0
5	9	1	244	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	114	10	299.8	3	0	0	88	1012	3
5	9	1	244	22	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	112	10	299.8	3	0	0	88	1012	3
5	9	1	244	23	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	112	10	299.5	3	0	0	94	1012	0
5	9	1	244	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	114	10	299.2	3	0	0	94	1012	3
5	9	2	245	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	299	3	0	0	94	1011	3
5	9	2	245	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	65	10	298.5	3	0	0	94	1011	0
5	9	2	245	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	77	10	298.4	3	0	0	100	1011	3
5	9	2	245	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	65	10	297.9	3	0	0	100	1011	3
5	9	2	245	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	298.1	3	0	0	94	1011	3
5	9	2	245	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	135	10	299.4	3	0	0	94	1012	3
5	9	2	245	7	-0.9	0.047	-9	-9	-999	23	9.9	0.212	0.48	0.46	0.9	100	10	302.6	3	0	0	94	1012	0
5	9	2	245	8	64.3	0.216	0.998	0.005	558	231	-14.2	0.212	0.48	0.24	1.6	128	10	304.1	3	0	0	82	1013	0
5	9	2	245	9	117.5	0.325	1.39	0.005	827	427	-26.5	0.687	0.8	0.19	1.7	159	10	302.9	3	0	0.76	80	1013	7
5	9	2	245	10	85.9	0.242	1.31	0.005	947	276	-14.8	0.212	0.48	0.18	1.8	122	10	303.1	3	0	0	80	1013	9
5	9	2	245	11	122.8	0.288	1.53	0.005	1054	356	-17.6	0.212	0.48	0.18	2.2	134	10	304.8	3	0	0	68	1013	8
5	9	2	245	12	156.1	0.257	1.717	0.005	1172	299	-9.8	0.212	0.48	0.18	1.8	139	10	305.6	3	0	0	75	1012	7
5	9	2	245	13	142.8	0.283	1.717	0.005	1279	347	-14.3	0.212	0.48	0.18	2.1	129	10	305.9	3	0	0	70	1010	7
5	9	2	245	14	99.6	0.255	1.552	0.005	1354	296	-15	0.212	0.48	0.18	1.9	122	10	305.9	3	0	0	66	1009	9
5	9	2	245	15	102.8	0.374	1.598	0.005	1429	526	-45.7	0.687	0.8	0.18	2.1	147	10	305.1	3	0	0	62	1009	9
5	9	2	245	16	43.2	0.227	1.205	0.005	1460	261	-24.3	0.212	0.48	0.19	1.8	131	10	304.6	3	0	0	66	1009	10
5	9	2	245	17	3.7	0.157	0.53	0.005	1458	145	-94.8	0.212	0.48	0.23	1.4	125	10	302.8	3	0	0	72	1009	10
5	9	2	245	18	0.1	0.105	0.16	0.005	1455	78	-1035.7	0.212	0.48	0.39	1	115	10	301.1	3	0	0	75	1010	3
5	9	2	245	19	-1.8	0.047	-9	-9	-999	24	5	0.212	0.48	1	0.9	100	10	300.4	3	0	0	85	1010	3
5	9	2	245	20	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	94	10	300	3	0	0	85	1011	3
5	9	2	245	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	93	10	299.8	3	0	0	88	1012	3
5	9	2	245	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	299.4	3	0	0	94	1012	3
5	9	2	245	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	299.2	3	0	0	97	1012	3
5	9	2	245	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	51	10	298.8	3	0	0	94	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	3	246	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	67	10	298.4	3	0	0	94	1012	3
5	9	3	246	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	75	10	298.2	3	0	0	97	1011	0
5	9	3	246	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	40	10	298	3	0	0	94	1011	3
5	9	3	246	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	41	10	297.9	3	0	0	94	1011	3
5	9	3	246	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	58	10	297.9	3	0	0	94	1012	3
5	9	3	246	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	298.9	3	0	0	100	1012	3
5	9	3	246	7	-0.6	0.036	-9	-9	-999	16	7.5	0.212	0.48	0.46	0.7	95	10	301.9	3	0	0	94	1013	0
5	9	3	246	8	61.4	0.186	0.841	0.005	350	185	-9.5	0.212	0.48	0.24	1.3	126	10	303.6	3	0	0	85	1014	0
5	9	3	246	9	104	0.246	1.249	0.005	678	281	-13	0.212	0.48	0.19	1.8	130	10	304.6	3	0	0	75	1014	4
5	9	3	246	10	142.1	0.244	1.583	0.006	1010	278	-9.3	0.212	0.48	0.18	1.7	113	10	305.9	3	0	0	62	1014	5
5	9	3	246	11	152	0.246	1.67	0.006	1109	281	-8.8	0.212	0.48	0.18	1.7	128	10	306.6	3	0	0	60	1013	6
5	9	3	246	12	149.3	0.265	1.708	0.007	1207	314	-11.3	0.212	0.48	0.18	1.9	134	10	306.9	3	0	0	56	1012	7
5	9	3	246	13	114.8	0.277	1.597	0.008	1281	336	-16.7	0.212	0.48	0.18	2.1	134	10	306.4	3	0	0	60	1011	8
5	9	3	246	14	102.7	0.274	1.565	0.008	1348	330	-18.1	0.212	0.48	0.18	2.1	131	10	306.1	3	0	0	58	1010	9
5	9	3	246	15	85.7	0.27	1.494	0.008	1402	322	-20.6	0.212	0.48	0.18	2.1	116	10	305.5	3	0	0	56	1010	9
5	9	3	246	16	35.8	0.223	1.122	0.008	1423	243	-28.1	0.212	0.48	0.19	1.8	122	10	304.5	3	0	0	58	1010	10
5	9	3	246	17	12.3	0.179	0.788	0.008	1429	174	-41.8	0.212	0.48	0.23	1.5	112	10	303.2	3	0	0	61	1010	10
5	9	3	246	18	0.1	0.125	0.158	0.008	1424	102	-1770.6	0.212	0.48	0.39	1.2	110	10	301	3	0	0	70	1010	3
5	9	3	246	19	-2.3	0.052	-9	-9	-999	29	5.6	0.212	0.48	1	1	96	10	299.9	3	0	0	79	1011	3
5	9	3	246	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	103	10	299.2	3	0	0	79	1012	3
5	9	3	246	21	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	102	10	298.9	3	0	0	82	1013	0
5	9	3	246	22	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	84	10	298.5	3	0	0	88	1013	0
5	9	3	246	23	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	74	10	298.2	3	0	0	91	1013	3
5	9	3	246	24	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	62	10	297.9	3	0	0	82	1012	0
5	9	4	247	1	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	108	10	297.6	3	0	0	82	1012	0
5	9	4	247	2	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	90	10	297.9	3	0	0	97	1012	0
5	9	4	247	3	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	111	10	297.9	3	0	0	94	1012	3
5	9	4	247	4	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	80	10	297.4	3	0	0	94	1012	3
5	9	4	247	5	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	84	10	297	3	0	0	97	1012	0
5	9	4	247	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	298.2	3	0	0	97	1012	3
5	9	4	247	7	-0.3	0.026	-9	-9	-999	10	5.4	0.212	0.48	0.46	0.5	110	10	301.9	3	0	0	94	1013	0
5	9	4	247	8	68.3	0.188	0.786	0.005	257	188	-8.8	0.212	0.48	0.24	1.3	119	10	303.8	3	0	0	88	1014	0
5	9	4	247	9	105.6	0.227	1.195	0.005	584	249	-10	0.212	0.48	0.19	1.6	133	10	304.8	3	0	0	75	1014	4
5	9	4	247	10	131.7	0.213	1.513	0.005	951	226	-6.6	0.212	0.48	0.18	1.4	120	10	305.9	3	0	0	66	1013	6
5	9	4	247	11	149.1	0.216	1.633	0.005	1057	231	-6.1	0.212	0.48	0.18	1.4	119	10	306.6	3	0	0	61	1013	7
5	9	4	247	12	103	0.167	1.477	0.005	1130	157	-4.1	0.212	0.48	0.18	1	113	10	306.6	3	0	0	58	1012	9
5	9	4	247	13	64	0.136	1.277	0.005	1175	116	-3.6	0.212	0.48	0.18	0.8	88	10	306.1	3	0	0	52	1011	10
5	9	4	247	14	41.3	0.159	1.113	0.005	1204	146	-8.8	0.212	0.48	0.18	1.1	133	10	305.6	3	0	0	56	1010	10
5	9	4	247	15	16.8	0.174	0.827	0.005	1214	167	-28.2	0.212	0.48	0.18	1.4	115	10	304.4	3	0	0	56	1010	10
5	9	4	247	16	10.4	0.177	0.707	0.005	1221	171	-47.6	0.212	0.48	0.19	1.5	124	10	303.9	3	0	0	62	1010	10
5	9	4	247	17	3.8	0.176	0.504	0.005	1222	170	-131.3	0.212	0.48	0.23	1.6	123	10	302.9	3	0	0	63	1010	10
5	9	4	247	18	0.1	0.105	0.15	0.005	1218	79	-1036.7	0.212	0.48	0.4	1	108	10	301	3	0	0	70	1011	3
5	9	4	247	19	-1.4	0.042	-9	-9	-999	21	4.5	0.212	0.48	1	0.8	106	10	300.2	3	0	0	79	1012	3
5	9	4	247	20	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	99	10	299.9	3	0	0	82	1012	3
5	9	4	247	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	299.4	3	0	0	82	1013	3
5	9	4	247	22	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	82	10	299	3	0	0	82	1013	0
5	9	4	247	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	298.4	3	0	0	82	1013	3
5	9	4	247	24	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	88	10	298.5	3	0	0	88	1012	0
5	9	5	248	1	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	94	10	297.9	3	0	0	88	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	5	248	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	297.6	3	0	0	91	1011	3
5	9	5	248	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	297.9	3	0	0	88	1011	3
5	9	5	248	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	77	10	297.9	3	0	0	88	1011	3
5	9	5	248	5	-0.6	0.026	-9	-9	-999	10	2.7	0.212	0.48	1	0.5	89	10	297.5	3	0	0	97	1012	0
5	9	5	248	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	298.9	3	0	0	94	1012	3
5	9	5	248	7	-0.4	0.031	-9	-9	-999	13	6.6	0.212	0.48	0.45	0.6	102	10	302.1	3	0	0	100	1012	0
5	9	5	248	8	71.4	0.149	0.758	0.005	221	132	-4.2	0.212	0.48	0.24	0.9	103	10	304.2	3	0	0	85	1013	0
5	9	5	248	9	92.7	0.143	1.031	0.005	428	124	-2.8	0.212	0.48	0.19	0.8	129	10	304.9	3	0	0	75	1013	6
5	9	5	248	10	90.2	0.142	1.179	0.005	657	124	-2.9	0.212	0.48	0.18	0.8	100	10	305.8	3	0	0	62	1013	8
5	9	5	248	11	56.3	0.167	1.072	0.005	791	157	-7.5	0.687	0.8	0.18	0.7	145	10	302.2	3	0	7.11	61	1013	10
5	9	5	248	12	39.2	0.201	0.985	0.005	880	208	-18.8	0.687	0.8	0.18	1	172	10	301	3	0	0	70	1012	10
5	9	5	248	13	53.6	0.236	1.143	0.005	1005	263	-22	0.687	0.8	0.18	1.2	149	10	301.2	3	0	0	75	1011	10
5	9	5	248	14	58.9	0.146	1.233	0.005	1145	130	-4.7	0.212	0.48	0.18	0.9	121	10	302	3	0	0	79	1010	10
5	9	5	248	15	39.6	0.139	1.109	0.005	1239	119	-6.1	0.212	0.48	0.18	0.9	86	10	302.5	3	0	0	75	1010	10
5	9	5	248	16	54.3	0.164	1.273	0.005	1370	153	-7.4	0.212	0.48	0.19	1.1	102	10	303.4	3	0	0	70	1010	9
5	9	5	248	17	10.5	0.139	0.741	0.005	1390	120	-23.1	0.212	0.48	0.23	1.1	127	10	302.4	3	0	0	70	1010	10
5	9	5	248	18	0.1	0.084	0.157	0.005	1383	57	-543	0.212	0.48	0.4	0.8	97	10	300.8	3	0	0	79	1010	7
5	9	5	248	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	299.6	3	0	0	82	1010	7
5	9	5	248	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	75	10	299.2	3	0	0	82	1011	7
5	9	5	248	21	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	110	10	298.8	3	0	0	77	1012	7
5	9	5	248	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	118	10	298.5	3	0	0	82	1013	3
5	9	5	248	23	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	150	10	298	3	0	0	94	1013	7
5	9	5	248	24	-1.9	0.052	-9	-9	-999	27	6.7	0.687	0.8	1	0.7	142	10	297.6	3	0	0	94	1012	3
5	9	6	249	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	297.9	3	0	0	88	1012	3
5	9	6	249	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	297.9	3	0	0	94	1011	3
5	9	6	249	3	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	89	10	297.6	3	0	0	94	1011	0
5	9	6	249	4	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	89	10	297.6	3	0	0	94	1011	0
5	9	6	249	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	97	10	297.1	3	0	0	94	1011	3
5	9	6	249	6	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	94	10	298.9	3	0	0	91	1012	3
5	9	6	249	7	-0.7	0.042	-9	-9	-999	19	8.8	0.212	0.48	0.45	0.8	103	10	301.9	3	0	0	88	1013	0
5	9	6	249	8	68.1	0.245	1.107	0.008	719	280	-19.6	0.212	0.48	0.24	1.9	132	10	303.1	3	0	0	82	1013	0
5	9	6	249	9	155.7	0.401	1.521	0.006	818	584	-37.4	0.687	0.8	0.19	2.2	148	10	304.4	3	0	0	75	1013	0
5	9	6	249	10	167.9	0.365	1.617	0.006	911	507	-26.1	0.687	0.8	0.18	1.9	151	10	305.4	3	0	0	62	1013	7
5	9	6	249	11	183.3	0.368	1.725	0.005	1013	513	-24.6	0.687	0.8	0.18	1.9	157	10	306.1	3	0	0	61	1013	7
5	9	6	249	12	210.3	0.4	1.862	0.005	1109	582	-27.5	0.687	0.8	0.18	2.1	148	10	306.6	3	0	0	60	1012	7
5	9	6	249	13	137.4	0.263	1.642	0.005	1163	321	-12	0.212	0.48	0.18	1.9	138	10	306.9	3	0	0	60	1011	8
5	9	6	249	14	113.2	0.277	1.63	0.005	1381	335	-16.9	0.212	0.48	0.18	2.1	131	10	306.4	3	0	0	62	1010	8
5	9	6	249	15	73.8	0.295	1.423	0.005	1408	368	-31.2	0.212	0.48	0.18	2.4	126	10	305.4	3	0	0	56	1009	9
5	9	6	249	16	52.1	0.268	1.273	0.005	1426	320	-33.3	0.212	0.48	0.19	2.2	124	10	305	3	0	0	62	1009	9
5	9	6	249	17	12.3	0.216	0.788	0.005	1428	232	-73.9	0.212	0.48	0.23	1.9	124	10	303.4	3	0	0	63	1010	10
5	9	6	249	18	0.1	0.136	0.158	0.005	1426	117	-2242.6	0.212	0.48	0.4	1.3	118	10	301.6	3	0	0	75	1010	7
5	9	6	249	19	-1.6	0.047	-9	-9	-999	28	5.7	0.212	0.48	1	0.9	100	10	300.8	3	0	0	75	1011	7
5	9	6	249	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	108	10	300.4	3	0	0	82	1012	7
5	9	6	249	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	299.9	3	0	0	88	1012	7
5	9	6	249	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	61	10	299.4	3	0	0	88	1013	7
5	9	6	249	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	36	10	298.9	3	0	0	85	1013	0
5	9	6	249	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	41	10	298.6	3	0	0	82	1013	7
5	9	7	250	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.4	3	0	0	82	1012	3
5	9	7	250	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.5	3	0	0	91	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	7	250	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	119	10	298.4	3	0	0	94	1012	3
5	9	7	250	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	101	10	298.1	3	0	0	88	1012	3
5	9	7	250	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	67	10	297.9	3	0	0	94	1012	0
5	9	7	250	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	299.4	3	0	0	94	1013	3
5	9	7	250	7	-0.4	0.031	-9	-9	-999	13	6.9	0.212	0.48	0.45	0.6	130	10	302.5	3	0	0	94	1013	0
5	9	7	250	8	60.2	0.215	0.871	0.005	397	229	-14.9	0.212	0.48	0.24	1.6	132	10	303.9	3	0	0	82	1014	0
5	9	7	250	9	105.3	0.256	1.324	0.005	798	298	-14.4	0.212	0.48	0.19	1.9	127	10	304.9	3	0	0	70	1014	0
5	9	7	250	10	133.3	0.243	1.553	0.005	1018	275	-9.7	0.212	0.48	0.18	1.7	132	10	306	3	0	0	62	1014	6
5	9	7	250	11	161.2	0.257	1.765	0.005	1235	300	-9.6	0.212	0.48	0.18	1.8	133	10	307.1	3	0	0	58	1014	6
5	9	7	250	12	152.7	0.246	1.79	0.006	1360	281	-8.8	0.212	0.48	0.18	1.7	125	10	307.5	3	0	0	52	1013	7
5	9	7	250	13	180.7	0.407	1.96	0.006	1506	596	-33.6	0.687	0.8	0.18	2.2	142	10	305.1	3	0	0	60	1012	8
5	9	7	250	14	179.5	0.38	1.988	0.006	1581	540	-27.7	0.687	0.8	0.18	2	143	10	306.4	3	0	0	58	1011	8
5	9	7	250	15	50.1	0.287	1.304	0.006	1595	358	-42.6	0.687	0.8	0.18	1.6	145	10	305.4	3	0	0	56	1011	10
5	9	7	250	16	32.6	0.193	1.132	0.005	1604	199	-20	0.212	0.48	0.19	1.5	112	10	304.2	3	0	0	58	1010	10
5	9	7	250	17	11	0.177	0.789	0.005	1606	172	-45.5	0.212	0.48	0.23	1.5	118	10	303.5	3	0	0	61	1011	10
5	9	7	250	18	0.1	0.115	0.165	0.005	1604	90	-1370.7	0.212	0.48	0.41	1.1	108	10	301.4	3	0	0	65	1011	7
5	9	7	250	19	-1.8	0.047	-9	-9	-999	25	5	0.212	0.48	1	0.9	95	10	300.4	3	0	0	79	1011	3
5	9	7	250	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	95	10	299.8	3	0	0	82	1012	0
5	9	7	250	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	299.4	3	0	0	79	1012	3
5	9	7	250	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	104	10	299.2	3	0	0	88	1013	3
5	9	7	250	23	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	106	10	298.9	3	0	0	88	1013	3
5	9	7	250	24	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	298.9	3	0	0	88	1013	3
5	9	8	251	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	298.4	3	0	0	88	1012	3
5	9	8	251	2	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	297.9	3	0	0	94	1012	3
5	9	8	251	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	297.9	3	0	0	100	1012	3
5	9	8	251	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	52	10	297.6	3	0	0	94	1012	3
5	9	8	251	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	77	10	297.4	3	0	0	94	1012	7
5	9	8	251	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	298.4	3	0	0	100	1013	3
5	9	8	251	7	-0.9	0.047	-9	-9	-999	23	10.1	0.212	0.48	0.45	0.9	96	10	301.9	3	0	0	94	1013	0
5	9	8	251	8	65.7	0.168	1.021	0.005	587	158	-6.5	0.212	0.48	0.24	1.1	96	10	303.9	3	0	0	80	1014	0
5	9	8	251	9	92.6	0.195	1.286	0.006	832	198	-7.2	0.212	0.48	0.19	1.3	111	10	304.8	3	0	0	70	1014	6
5	9	8	251	10	122.8	0.221	1.453	0.006	905	239	-8	0.212	0.48	0.18	1.5	117	10	305.8	3	0	0	58	1014	7
5	9	8	251	11	140.1	0.214	1.564	0.006	988	228	-6.3	0.212	0.48	0.18	1.4	120	10	306.6	3	0	0	54	1013	7
5	9	8	251	12	112	0.199	1.484	0.006	1055	204	-6.3	0.212	0.48	0.18	1.3	121	10	306.8	3	0	0	54	1012	9
5	9	8	251	13	91	0.195	1.408	0.007	1109	198	-7.3	0.212	0.48	0.18	1.3	102	10	306.4	3	0	0	52	1011	9
5	9	8	251	14	86.6	0.181	1.406	0.007	1159	177	-6.2	0.562	0.7	0.18	0.8	357	10	305.5	3	0	0	51	1010	10
5	9	8	251	15	59.1	0.225	1.251	0.007	1193	245	-17.3	0.562	0.7	0.18	1.2	346	10	304.4	3	0	0	54	1010	10
5	9	8	251	16	12	0.141	0.737	0.007	1199	124	-21	0.212	0.48	0.19	1.1	129	10	304.2	3	0	0	56	1010	10
5	9	8	251	17	5.2	0.16	0.559	0.007	1201	147	-70.4	0.212	0.48	0.23	1.4	114	10	303.1	3	0	0	61	1010	10
5	9	8	251	18	0.1	0.115	0.15	0.007	1198	90	-1370.7	0.212	0.48	0.41	1.1	114	10	301.5	3	0	0	70	1011	7
5	9	8	251	19	-1.3	0.042	-9	-9	-999	22	5	0.212	0.48	1	0.8	104	10	300.4	3	0	0	85	1011	7
5	9	8	251	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	300	3	0	0	85	1012	7
5	9	8	251	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	299.9	3	0	0	82	1013	7
5	9	8	251	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	94	10	299.4	3	0	0	82	1013	7
5	9	8	251	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	89	10	299.1	3	0	0	91	1013	7
5	9	8	251	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	298.9	3	0	0	88	1012	7
5	9	9	252	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	298.4	3	0	0	94	1012	7
5	9	9	252	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	88	10	298.6	3	0	0	94	1011	7
5	9	9	252	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	62	10	298.4	3	0	0	94	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	9	252	4	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	88	10	298	3	0	0	94	1012	7
5	9	9	252	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	298.1	3	0	0	94	1012	7
5	9	9	252	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	98	10	299.9	3	0	0	94	1013	7
5	9	9	252	7	-0.8	0.047	-9	-9	-999	23	10.9	0.212	0.48	0.45	0.9	110	10	302.9	3	0	0	100	1013	0
5	9	9	252	8	70.1	0.227	1.183	0.005	854	250	-15.2	0.212	0.48	0.24	1.7	134	10	304.4	3	0	0	82	1014	0
5	9	9	252	9	108.5	0.247	1.429	0.005	974	283	-12.6	0.212	0.48	0.19	1.8	134	10	305.4	3	0	0	75	1014	0
5	9	9	252	10	148	0.255	1.65	0.005	1100	296	-10.1	0.212	0.48	0.18	1.8	129	10	306.5	3	0	0	64	1014	0
5	9	9	252	11	147.8	0.255	1.696	0.005	1195	296	-10.1	0.212	0.48	0.18	1.8	131	10	307	3	0	0	68	1013	7
5	9	9	252	12	154.1	0.266	1.812	0.005	1396	315	-11	0.212	0.48	0.18	1.9	132	10	307.5	3	0	0	60	1013	7
5	9	9	252	13	131.8	0.252	1.76	0.006	1496	291	-11	0.212	0.48	0.18	1.8	132	10	307.5	3	0	0	52	1012	8
5	9	9	252	14	113.8	0.268	1.7	0.006	1560	318	-15.2	0.212	0.48	0.18	2	132	10	307.4	3	0	0	51	1011	8
5	9	9	252	15	90.8	0.271	1.59	0.006	1596	325	-19.8	0.212	0.48	0.18	2.1	134	10	306.8	3	0	0	54	1010	9
5	9	9	252	16	52.5	0.25	1.33	0.006	1616	287	-26.7	0.212	0.48	0.19	2	128	10	305.9	3	0	0	54	1011	9
5	9	9	252	17	12.6	0.188	0.828	0.006	1619	189	-47.7	0.212	0.48	0.23	1.6	118	10	304	3	0	0	54	1011	10
5	9	9	252	18	0.1	0.115	0.165	0.006	1615	91	-1372.1	0.212	0.48	0.41	1.1	108	10	301.8	3	0	0	65	1012	3
5	9	9	252	19	-1.4	0.042	-9	-9	-999	22	4.5	0.212	0.48	1	0.8	96	10	300.9	3	0	0	74	1012	3
5	9	9	252	20	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	85	10	300.4	3	0	0	79	1013	0
5	9	9	252	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	299.8	3	0	0	79	1014	3
5	9	9	252	22	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	99	10	299.6	3	0	0	82	1014	3
5	9	9	252	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	111	10	299.4	3	0	0	85	1013	3
5	9	9	252	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.2	3	0	0	88	1013	3
5	9	10	253	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	298.9	3	0	0	88	1012	3
5	9	10	253	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	67	10	298.4	3	0	0	97	1012	0
5	9	10	253	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	298	3	0	0	94	1012	3
5	9	10	253	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	108	10	297.9	3	0	0	94	1012	3
5	9	10	253	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	110	10	297.8	3	0	0	91	1013	0
5	9	10	253	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	299.4	3	0	0	94	1014	3
5	9	10	253	7	-0.9	0.047	-9	-9	-999	23	10.7	0.212	0.48	0.45	0.9	106	10	302.5	3	0	0	88	1014	0
5	9	10	253	8	53.5	0.183	0.982	0.005	641	181	-10.4	0.212	0.48	0.24	1.3	104	10	304.2	3	0	0	77	1015	0
5	9	10	253	9	100.1	0.207	1.286	0.005	769	216	-8	0.212	0.48	0.19	1.4	121	10	305.1	3	0	0	66	1015	6
5	9	10	253	10	136.6	0.214	1.547	0.005	982	227	-6.5	0.212	0.48	0.18	1.4	132	10	306.5	3	0	0	62	1015	6
5	9	10	253	11	93.9	0.195	1.421	0.005	1105	199	-7.2	0.212	0.48	0.18	1.3	124	10	306.5	3	0	0	58	1014	9
5	9	10	253	12	119.6	0.2	1.569	0.005	1168	206	-6.1	0.212	0.48	0.18	1.3	117	10	307	3	0	0	56	1013	8
5	9	10	253	13	97.4	0.132	1.487	0.005	1220	112	-2.1	0.212	0.48	0.18	0.7	88	10	307.4	3	0	0	51	1012	9
5	9	10	253	14	94.2	0.237	1.49	0.005	1268	265	-12.7	0.562	0.7	0.18	1.2	342	10	305.8	3	0	0	48	1011	9
5	9	10	253	15	65.7	0.201	1.333	0.005	1302	208	-11.2	0.562	0.7	0.18	1	77	10	305.8	3	0	0	56	1011	10
5	9	10	253	16	12.2	0.16	0.762	0.005	1307	147	-30.3	0.212	0.48	0.19	1.3	105	10	304.5	3	0	0	56	1011	10
5	9	10	253	17	1	0.17	0.329	0.005	1305	161	-449.3	0.212	0.48	0.23	1.6	117	10	303	3	0	0	64	1012	10
5	9	10	253	18	0.1	0.136	0.154	0.005	1303	115	-2247	0.212	0.48	0.42	1.3	113	10	301.5	3	0	0	70	1012	3
5	9	10	253	19	-2.3	0.052	-9	-9	-999	31	5.6	0.212	0.48	1	1	110	10	300.6	3	0	0	75	1013	3
5	9	10	253	20	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	107	10	300	3	0	0	80	1013	3
5	9	10	253	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	300	3	0	0	79	1013	7
5	9	10	253	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	84	10	299.9	3	0	0	82	1014	7
5	9	10	253	23	-6.1	0.097	-9	-9	-999	70	13.6	0.562	0.7	1	1.4	74	10	298.8	3	0	1.52	88	1014	7
5	9	10	253	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	77	10	297.5	3	0	0	94	1013	7
5	9	11	254	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	297.5	3	0	0	94	1013	7
5	9	11	254	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	297.4	3	0	0	79	1012	7
5	9	11	254	3	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	88	10	297.6	3	0	0	74	1012	7
5	9	11	254	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	110	10	297.8	3	0	3.81	94	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	11	254	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.8	3	0	0	97	1013	7
5	9	11	254	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	65	10	298	3	0	0	98	1014	7
5	9	11	254	7	-0.5	0.035	-9	-9	-999	15	8	0.562	0.7	0.45	0.5	68	10	299.2	3	0	0	100	1014	0
5	9	11	254	8	45.9	0.245	0.667	0.005	233	280	-29.1	0.687	0.8	0.24	1.3	169	10	299.6	3	0	1.02	85	1015	8
5	9	11	254	9	138.1	0.29	1.448	0.006	796	360	-16	0.687	0.8	0.19	1.4	155	10	300.8	3	0	0	94	1015	5
5	9	11	254	10	130.9	0.275	1.481	0.006	900	331	-14.3	0.687	0.8	0.18	1.3	158	10	301.8	3	0	0	91	1015	8
5	9	11	254	11	191.9	0.369	1.773	0.006	1053	516	-23.7	0.687	0.8	0.18	1.9	140	10	303.9	3	0	0	66	1014	7
5	9	11	254	12	146.9	0.321	1.667	0.006	1141	420	-20.4	0.212	0.48	0.18	2.5	132	10	305.1	3	0	0	60	1013	7
5	9	11	254	13	126.5	0.317	1.621	0.006	1218	411	-22.8	0.212	0.48	0.18	2.5	135	10	305.9	3	0	0	52	1012	8
5	9	11	254	14	99.4	0.273	1.52	0.006	1277	329	-18.5	0.212	0.48	0.18	2.1	121	10	305.6	3	0	0	61	1012	9
5	9	11	254	15	78	0.296	1.419	0.005	1322	370	-29.9	0.212	0.48	0.18	2.4	121	10	305.1	3	0	0	60	1012	9
5	9	11	254	16	7.1	0.201	0.639	0.005	1323	210	-103	0.212	0.48	0.19	1.8	119	10	303.2	3	0	0	54	1012	10
5	9	11	254	17	0.1	0.136	0.154	0.005	1320	116	-2247	0.212	0.48	0.23	1.3	114	10	301.8	3	0	0	59	1012	10
5	9	11	254	18	0.1	0.115	0.154	0.005	1318	90	-1373	0.212	0.48	0.42	1.1	109	10	300.5	3	0	0	70	1013	3
5	9	11	254	19	-1.4	0.042	-9	-9	-999	22	4.5	0.212	0.48	1	0.8	110	10	299.8	3	0	0	85	1013	3
5	9	11	254	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	299.4	3	0	0	79	1014	3
5	9	11	254	21	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	107	10	298.9	3	0	0	88	1014	3
5	9	11	254	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	65	10	298.9	3	0	0	88	1014	3
5	9	11	254	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	298.9	3	0	0	94	1014	0
5	9	11	254	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	58	10	298.5	3	0	0	88	1014	3
5	9	12	255	1	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	64	10	298	3	0	0	88	1014	3
5	9	12	255	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	297.9	3	0	0	88	1013	3
5	9	12	255	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	61	10	297.8	3	0	0	88	1013	3
5	9	12	255	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	297.4	3	0	0	94	1014	3
5	9	12	255	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	93	10	297.9	3	0	0	91	1014	0
5	9	12	255	6	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	96	10	298.8	3	0	0	94	1014	3
5	9	12	255	7	-2	0.082	-9	-9	-999	54	24.8	0.212	0.48	0.45	1.2	101	10	301.4	3	0	0	88	1014	0
5	9	12	255	8	71.2	0.218	1.068	0.005	619	235	-13.2	0.212	0.48	0.24	1.6	107	10	303.6	3	0	0	77	1015	0
5	9	12	255	9	104.3	0.284	1.398	0.005	948	348	-19.8	0.212	0.48	0.19	2.2	115	10	304.9	3	0	0	70	1015	5
5	9	12	255	10	107.8	0.294	1.447	0.005	1019	367	-21.4	0.212	0.48	0.18	2.3	118	10	305.4	3	0	0	56	1015	8
5	9	12	255	11	156.3	0.314	1.691	0.006	1122	404	-17.9	0.212	0.48	0.18	2.4	114	10	306.2	3	0	0	56	1014	6
5	9	12	255	12	146.1	0.303	1.7	0.006	1218	383	-17.2	0.212	0.48	0.18	2.3	109	10	306.4	3	0	0	75	1014	7
5	9	12	255	13	141.8	0.292	1.726	0.006	1312	364	-15.9	0.212	0.48	0.18	2.2	112	10	306.8	3	0	0	52	1013	8
5	9	12	255	14	120.7	0.288	1.669	0.005	1391	355	-17.8	0.212	0.48	0.18	2.2	113	10	306.4	3	0	0	66	1012	8
5	9	12	255	15	87.3	0.27	1.518	0.005	1448	323	-20.4	0.212	0.48	0.18	2.1	112	10	305.8	3	0	0	70	1012	9
5	9	12	255	16	45.9	0.247	1.233	0.005	1475	282	-29.6	0.212	0.48	0.19	2	115	10	304.5	3	0	0	62	1012	9
5	9	12	255	17	6.2	0.19	0.633	0.005	1474	191	-99.9	0.212	0.48	0.23	1.7	109	10	302.4	3	0	0	68	1012	10
5	9	12	255	18	0.1	0.105	0.16	0.005	1471	80	-1037.7	0.212	0.48	0.42	1	106	10	300.8	3	0	0	75	1012	3
5	9	12	255	19	-1.4	0.042	-9	-9	-999	21	4.5	0.212	0.48	1	0.8	94	10	300.2	3	0	0	88	1012	3
5	9	12	255	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	299.9	3	0	0	88	1013	0
5	9	12	255	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	299.5	3	0	0	82	1014	3
5	9	12	255	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	85	10	299	3	0	0	94	1014	3
5	9	12	255	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	298.9	3	0	0	94	1014	3
5	9	12	255	24	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	65	10	298.8	3	0	0	88	1013	3
5	9	13	256	1	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	79	10	298.6	3	0	0	94	1012	3
5	9	13	256	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	298.4	3	0	0	97	1012	3
5	9	13	256	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	81	10	298.1	3	0	0	94	1012	3
5	9	13	256	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	89	10	297.9	3	0	0	94	1012	3
5	9	13	256	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	297.8	3	0	0	97	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	13	256	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	98	10	299	3	0	0	100	1013	3
5	9	13	256	7	-0.5	0.036	-9	-9	-999	16	8.6	0.212	0.48	0.45	0.7	111	10	302.4	3	0	0	88	1014	0
5	9	13	256	8	59	0.166	1.058	0.005	725	155	-7	0.212	0.48	0.24	1.1	118	10	304.1	3	0	0	82	1014	0
5	9	13	256	9	102.9	0.207	1.324	0.005	817	217	-7.8	0.212	0.48	0.19	1.4	124	10	305	3	0	0	76	1015	5
5	9	13	256	10	149.7	0.196	1.6	0.005	991	199	-4.5	0.212	0.48	0.18	1.2	130	10	306.9	3	0	0	70	1014	0
5	9	13	256	11	91.5	0.249	1.403	0.005	1093	286	-15.2	0.562	0.7	0.18	1.3	349	10	304.5	3	0	0	60	1014	9
5	9	13	256	12	42.8	0.155	1.105	0.005	1139	143	-7.8	0.24	0.3	0.16	1	256	10	302.4	3	0	2.54	56	1013	10
5	9	13	256	13	159.7	0.238	1.802	0.005	1326	267	-7.6	0.562	0.7	0.18	1.1	339	10	304.2	3	0	0	60	1012	8
5	9	13	256	14	12.4	0.165	0.772	0.005	1335	155	-32.6	0.24	0.3	0.16	1.3	291	10	302	3	0	7.87	56	1012	10
5	9	13	256	15	6.9	0.173	0.634	0.005	1337	166	-68.6	0.562	0.7	0.18	1.1	341	10	299.1	3	0	2.54	56	1011	10
5	9	13	256	16	5.1	0.145	0.577	0.005	1344	128	-53.9	0.562	0.7	0.19	0.9	17	10	299.6	3	0	0	56	1011	10
5	9	13	256	17	0.1	0.099	0.155	0.005	1344	72	-867.2	0.562	0.7	0.23	0.7	41	10	299.8	3	0	0	75	1012	10
5	9	13	256	18	0.1	0.074	0.155	0.005	1342	47	-372.4	0.212	0.48	0.43	0.7	86	10	299.4	3	0	0	85	1012	3
5	9	13	256	19	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	299.1	3	0	0	88	1013	7
5	9	13	256	20	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	101	10	298.9	3	0	0	82	1014	0
5	9	13	256	21	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	298.5	3	0	0	82	1014	3
5	9	13	256	22	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	67	10	298.2	3	0	0	88	1014	3
5	9	13	256	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	67	10	298.1	3	0	0	94	1014	0
5	9	13	256	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	93	10	297.9	3	0	0	94	1013	3
5	9	14	257	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	297.9	3	0	0	94	1013	3
5	9	14	257	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	88	10	297.9	3	0	0	94	1013	3
5	9	14	257	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	297.9	3	0	0	100	1013	3
5	9	14	257	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	83	10	297.9	3	0	0	94	1013	3
5	9	14	257	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	297.6	3	0	0	97	1013	3
5	9	14	257	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	298.5	3	0	0	100	1014	3
5	9	14	257	7	-0.8	0.049	-9	-9	-999	25	12.8	0.562	0.7	0.45	0.7	68	10	301.5	3	0	0	94	1015	0
5	9	14	257	8	87.1	0.209	1.09	0.005	538	219	-9.4	0.562	0.7	0.24	1	79	10	303.6	3	0	0	85	1015	0
5	9	14	257	9	105.4	0.208	1.325	0.005	800	218	-7.7	0.212	0.48	0.19	1.4	111	10	304.9	3	0	0	70	1015	0
5	9	14	257	10	106.4	0.198	1.424	0.005	982	203	-6.6	0.212	0.48	0.18	1.3	116	10	305.5	3	0	0	62	1015	8
5	9	14	257	11	147.5	0.236	1.646	0.005	1095	263	-8	0.212	0.48	0.18	1.6	116	10	306.5	3	0	0	62	1014	7
5	9	14	257	12	62.4	0.138	1.254	0.005	1141	121	-3.8	0.687	0.8	0.18	0.5	174	10	305.2	3	0	0	60	1013	10
5	9	14	257	13	14.6	0.208	0.775	0.005	1148	218	-55.4	0.674	0.73	0.17	1.2	249	10	301.9	3	0	0	56	1012	10
5	9	14	257	14	33.3	-9	-9	-9	1172	-999	-99999	0.475	0.6	0.17	0	0	10	300.9	3	0	7.87	61	1012	10
5	9	14	257	15	54.9	0.112	1.228	0.005	1217	86	-2.3	0.212	0.48	0.18	0.6	90	10	303.4	3	0	0	58	1011	10
5	9	14	257	16	26.2	0.133	0.965	0.005	1236	111	-8	0.212	0.48	0.19	0.9	100	10	303.1	3	0	0	61	1011	10
5	9	14	257	17	6.1	0.124	0.594	0.005	1239	100	-28.2	0.212	0.48	0.24	1	108	10	302.1	3	0	0	63	1012	10
5	9	14	257	18	0.1	0.095	0.151	0.005	1237	67	-763.7	0.212	0.48	0.43	0.9	113	10	300.8	3	0	0	70	1012	7
5	9	14	257	19	-1.1	0.036	-9	-9	-999	17	3.8	0.212	0.48	1	0.7	106	10	300	3	0	0	79	1012	0
5	9	14	257	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	88	10	299.5	3	0	0	82	1013	7
5	9	14	257	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	299.2	3	0	0	82	1014	3
5	9	14	257	22	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	72	10	298.8	3	0	0	82	1014	0
5	9	14	257	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	68	10	298.4	3	0	0	88	1013	7
5	9	14	257	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	298	3	0	0	88	1013	7
5	9	15	258	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	297.9	3	0	0	88	1012	7
5	9	15	258	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	82	10	297.9	3	0	0	94	1012	0
5	9	15	258	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	78	10	297.9	3	0	0	94	1012	7
5	9	15	258	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	71	10	297.9	3	0	0	94	1012	7
5	9	15	258	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	43	10	297.6	3	0	0	94	1013	7
5	9	15	258	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	46	10	298.8	3	0	0	94	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	15	258	7	-0.5	0.036	-9	-9	-999	16	8.7	0.212	0.48	0.45	0.7	86	10	302.2	3	0	0	82	1014	0
5	9	15	258	8	56.2	0.194	1.002	0.005	647	197	-11.8	0.212	0.48	0.24	1.4	106	10	303.9	3	0	0	80	1015	0
5	9	15	258	9	109.9	0.257	1.323	0.005	764	300	-14	0.212	0.48	0.19	1.9	113	10	305.1	3	0	0	75	1015	0
5	9	15	258	10	140.7	0.254	1.536	0.005	933	294	-10.5	0.212	0.48	0.18	1.8	109	10	306.1	3	0	0	56	1015	5
5	9	15	258	11	162.5	0.258	1.701	0.005	1096	301	-9.5	0.212	0.48	0.18	1.8	112	10	306.9	3	0	0	58	1014	5
5	9	15	258	12	115	0.258	1.567	0.005	1211	302	-13.6	0.212	0.48	0.18	1.9	126	10	306.8	3	0	0	57	1013	8
5	9	15	258	13	54.5	0.241	1.24	0.006	1262	272	-23.1	0.212	0.48	0.18	1.9	126	10	305.1	3	0	0	56	1012	10
5	9	15	258	14	79.5	0.258	1.434	0.006	1340	302	-19.6	0.212	0.48	0.18	2	117	10	304.5	3	0	0	58	1011	9
5	9	15	258	15	76.7	0.248	1.445	0.005	1419	284	-18	0.212	0.48	0.18	1.9	116	10	305.4	3	0	0	66	1011	9
5	9	15	258	16	26.6	0.209	1.021	0.005	1441	220	-30.9	0.212	0.48	0.19	1.7	112	10	304	3	0	0	56	1011	10
5	9	15	258	17	3.5	0.147	0.52	0.005	1440	130	-81.7	0.212	0.48	0.24	1.3	111	10	302.5	3	0	0	68	1011	10
5	9	15	258	18	0.1	0.095	0.159	0.005	1437	67	-763.5	0.212	0.48	0.44	0.9	113	10	301.4	3	0	0	75	1012	7
5	9	15	258	19	-1.6	0.047	-9	-9	-999	24	5.7	0.212	0.48	1	0.9	117	10	300.6	3	0	0	74	1013	7
5	9	15	258	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	108	10	300.1	3	0	0	85	1014	7
5	9	15	258	21	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	97	10	299.9	3	0	0	88	1015	7
5	9	15	258	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	299.5	3	0	0	82	1015	7
5	9	15	258	23	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	91	10	299.4	3	0	0	88	1014	7
5	9	15	258	24	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	77	10	299	3	0	0	82	1014	0
5	9	16	259	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	73	10	298.8	3	0	0	88	1013	0
5	9	16	259	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.5	3	0	0	94	1013	7
5	9	16	259	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	104	10	298.4	3	0	0	88	1012	7
5	9	16	259	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	91	10	298.2	3	0	0	94	1013	7
5	9	16	259	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	84	10	298.2	3	0	0	97	1013	7
5	9	16	259	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	80	10	298.9	3	0	0	94	1013	7
5	9	16	259	7	-0.5	0.036	-9	-9	-999	16	8.7	0.212	0.48	0.45	0.7	93	10	302	3	0	0	88	1014	0
5	9	16	259	8	75.7	0.191	0.875	0.005	320	191	-8.3	0.212	0.48	0.24	1.3	114	10	304.1	3	0	0	80	1014	0
5	9	16	259	9	122	0.191	1.3	0.005	653	191	-5.1	0.212	0.48	0.19	1.2	122	10	305.9	3	0	0	70	1015	0
5	9	16	259	10	123.2	0.181	1.436	0.005	871	177	-4.3	0.212	0.48	0.18	1.1	126	10	306.4	3	0	0	62	1014	7
5	9	16	259	11	93.9	0.21	1.356	0.005	960	222	-9	0.562	0.7	0.18	1	352	10	305.2	3	0	0	56	1014	9
5	9	16	259	12	32.5	0.141	0.962	0.005	990	123	-7.9	0.687	0.8	0.18	0.6	207	10	303.4	3	0	9.4	51	1013	10
5	9	16	259	13	44	-9	-9	-9	1029	-999	-99999	0.475	0.6	0.17	0	0	10	301.4	3	0	0.76	52	1012	10
5	9	16	259	14	13.4	0.195	0.728	0.005	1041	198	-50.2	0.562	0.7	0.18	1.2	337	10	300.5	3	0	8.89	66	1011	10
5	9	16	259	15	19.6	0.214	0.831	0.005	1057	228	-45.1	0.687	0.8	0.18	1.2	192	10	299	3	0	21.08	66	1012	10
5	9	16	259	16	13	0.083	0.729	0.005	1072	68	-4	0.212	0.48	0.19	0.5	108	10	300	3	0	0.25	70	1011	10
5	9	16	259	17	0.8	0.081	0.292	0.005	1071	53	-57.9	0.212	0.48	0.24	0.7	108	10	299.6	3	0	0	75	1011	10
5	9	16	259	18	0.1	0.084	0.144	0.005	1071	56	-544.2	0.212	0.48	0.44	0.8	105	10	299.4	3	0	0	79	1012	7
5	9	16	259	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	99	10	299.4	3	0	0	79	1013	7
5	9	16	259	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	107	10	299	3	0	0	82	1013	7
5	9	16	259	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	100	10	298.9	3	0	0	88	1014	7
5	9	16	259	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.8	3	0	0	88	1014	7
5	9	16	259	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	298.4	3	0	0	88	1013	7
5	9	16	259	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	79	10	298.1	3	0	0	82	1013	7
5	9	17	260	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	60	10	297.8	3	0	0	94	1012	7
5	9	17	260	2	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	92	10	297.4	3	0	0	90	1011	7
5	9	17	260	3	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	131	10	297.4	3	0	0	94	1011	7
5	9	17	260	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	136	10	297.8	3	0	0	94	1011	7
5	9	17	260	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	134	10	297.4	3	0	0	97	1012	7
5	9	17	260	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	94	1012	7
5	9	17	260	7	-0.6	0.042	-9	-9	-999	20	10.3	0.562	0.7	0.45	0.6	55	10	299.8	3	0	0	88	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	17	260	8	75.5	0.272	0.909	0.005	359	325	-24	0.687	0.8	0.24	1.4	190	10	301.8	3	0	0	85	1013	0
5	9	17	260	9	55	0.343	0.935	0.005	537	461	-66.1	0.687	0.8	0.19	2	212	10	301.8	3	0	0	66	1013	10
5	9	17	260	10	92.9	0.355	1.304	0.007	862	487	-43.6	0.674	0.73	0.17	2	216	10	302.8	3	0	0	75	1013	9
5	9	17	260	11	133	0.341	1.511	0.006	937	458	-26.9	0.674	0.73	0.17	1.8	232	10	303.8	3	0	0	68	1012	9
5	9	17	260	12	113	0.235	1.457	0.006	989	267	-10.4	0.24	0.3	0.16	1.6	265	10	305.5	3	0	0	66	1012	7
5	9	17	260	13	73.8	0.196	1.277	0.005	1018	199	-9.1	0.24	0.3	0.16	1.3	260	10	304.8	3	0	0	58	1010	9
5	9	17	260	14	152	0.327	1.657	0.005	1079	431	-20.8	0.562	0.7	0.18	1.8	345	10	304.2	3	0	0	65	1010	8
5	9	17	260	15	88.7	0.298	1.4	0.005	1114	375	-27	0.562	0.7	0.18	1.7	354	10	303.4	3	0	0	94	1009	9
5	9	17	260	16	25.2	0.219	0.924	0.005	1123	237	-37.2	0.562	0.7	0.19	1.3	14	10	302.2	3	0	0	75	1009	10
5	9	17	260	17	16.7	0.174	0.806	0.005	1130	168	-28.5	0.562	0.7	0.24	1	24	10	302.4	3	0	0	75	1009	10
5	9	17	260	18	0.1	0.115	0.147	0.005	1128	90	-1368.9	0.212	0.48	0.44	1.1	91	10	300.9	3	0	0	79	1009	7
5	9	17	260	19	-2	0.052	-9	-9	-999	28	6.3	0.212	0.48	1	1	99	10	300	3	0	0	82	1010	7
5	9	17	260	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	95	10	299.8	3	0	0	85	1011	7
5	9	17	260	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	92	10	299.2	3	0	0	82	1012	7
5	9	17	260	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	112	10	298.9	3	0	0	88	1012	7
5	9	17	260	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	299.1	3	0	0	88	1011	7
5	9	17	260	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	71	10	298.4	3	0	0	88	1011	7
5	9	18	261	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.9	3	0	0	94	1010	7
5	9	18	261	2	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	124	10	297.8	3	0	0	94	1010	7
5	9	18	261	3	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	143	10	298	3	0	0	94	1010	7
5	9	18	261	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	91	10	297.9	3	0	0	94	1010	7
5	9	18	261	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	297.9	3	0	0	97	1010	7
5	9	18	261	6	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	143	10	299.4	3	0	0	100	1010	7
5	9	18	261	7	-2.3	0.11	-9	-9	-999	84	53	0.687	0.8	0.45	1	161	10	301.6	3	0	0	82	1011	0
5	9	18	261	8	40	0.229	0.862	0.005	577	252	-27.1	0.687	0.8	0.24	1.2	199	10	301.9	3	0	0	77	1012	9
5	9	18	261	9	145.2	0.359	1.489	0.005	821	495	-28.8	0.687	0.8	0.19	1.9	204	10	303.5	3	0	0	75	1012	0
5	9	18	261	10	189.8	0.383	1.731	0.005	988	544	-26.6	0.687	0.8	0.18	2	212	10	305	3	0	0	66	1012	5
5	9	18	261	11	61.1	0.33	1.208	0.005	1041	438	-53.2	0.674	0.73	0.17	1.9	236	10	304.4	3	0	0	58	1011	10
5	9	18	261	12	33.2	0.199	0.994	0.005	1067	214	-21.6	0.562	0.7	0.18	1.1	58	10	302	3	0	0	70	1010	10
5	9	18	261	13	20.6	0.19	0.852	0.005	1082	190	-29.9	0.562	0.7	0.18	1.1	71	10	299.9	3	0	0	94	1010	10
5	9	18	261	14	60.5	0.238	1.238	0.005	1131	267	-20	0.562	0.7	0.18	1.3	80	10	300	3	0	0	88	1009	10
5	9	18	261	15	68.7	0.216	1.311	0.005	1181	231	-13.2	0.562	0.7	0.18	1.1	77	10	301.5	3	0	0	88	1009	10
5	9	18	261	16	53.3	0.235	1.215	0.005	1212	262	-21.9	0.562	0.7	0.19	1.3	78	10	302.4	3	0	0	75	1008	10
5	9	18	261	17	8.5	0.146	0.66	0.005	1215	131	-33.1	0.212	0.48	0.24	1.2	87	10	301.4	3	0	0	77	1008	10
5	9	18	261	18	0.1	0.105	0.15	0.005	1214	78	-1035	0.212	0.48	0.45	1	97	10	300.4	3	0	0	85	1009	7
5	9	18	261	19	-2.4	0.057	-9	-9	-999	32	6.9	0.212	0.48	1	1.1	109	10	300.2	3	0	0	88	1010	7
5	9	18	261	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	299.9	3	0	0	88	1010	7
5	9	18	261	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	299.5	3	0	0	88	1011	7
5	9	18	261	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	73	10	299.1	3	0	0	94	1011	7
5	9	18	261	23	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.6	3	0	0	91	1010	7
5	9	18	261	24	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	104	10	298.8	3	0	0	94	1010	7
5	9	19	262	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.8	3	0	0	100	1010	7
5	9	19	262	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.4	3	0	0	94	1009	7
5	9	19	262	3	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	126	10	298.2	3	0	0	94	1009	7
5	9	19	262	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	114	10	298.8	3	0	0	100	1010	7
5	9	19	262	5	-4.2	0.082	-9	-9	-999	54	11.9	0.687	0.8	1	1.1	166	10	299	3	0	0	97	1010	7
5	9	19	262	6	-1.7	0.052	-9	-9	-999	28	7.6	0.687	0.8	1	0.7	153	10	298.9	3	0	0	94	1011	7
5	9	19	262	7	-1.6	0.067	-9	-9	-999	40	17.6	0.687	0.8	0.45	0.9	151	10	299.9	3	0	0	94	1012	0
5	9	19	262	8	54.7	0.154	0.738	0.005	265	139	-6.1	0.212	0.48	0.24	1	133	10	302	3	0	0	77	1013	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	19	262	9	100.4	0.253	1.082	0.005	455	293	-14.6	0.687	0.8	0.19	1.2	186	10	304	3	0	0	70	1013	8
5	9	19	262	10	70.8	0.336	1.049	0.005	588	449	-48.5	0.687	0.8	0.18	1.9	201	10	303	3	0	4.83	66	1013	10
5	9	19	262	11	51.2	0.235	0.99	0.005	684	266	-22.7	0.687	0.8	0.18	1.2	199	10	300.6	3	0	0.51	82	1012	10
5	9	19	262	12	17.8	0.111	0.711	0.005	727	94	-6.9	0.562	0.7	0.18	0.5	80	10	301.6	3	0	5.59	91	1011	10
5	9	19	262	13	6.5	0.148	0.512	0.005	735	131	-44.9	0.562	0.7	0.18	0.9	78	10	298.4	3	0	20.07	94	1010	10
5	9	19	262	14	11.4	0.102	0.622	0.005	763	75	-8.5	0.212	0.48	0.18	0.7	92	10	299	3	0	0	94	1009	10
5	9	19	262	15	22.6	0.141	0.932	0.005	1291	122	-11.2	0.562	0.7	0.18	0.7	69	10	300.2	3	0	0	82	1009	10
5	9	19	262	16	18.3	0.125	0.878	0.005	1326	101	-9.5	0.562	0.7	0.19	0.6	48	10	299.9	3	0	0	85	1009	10
5	9	19	262	17	0.9	0.091	0.317	0.005	1327	63	-78.4	0.212	0.48	0.24	0.8	90	10	299.8	3	0	0	82	1009	10
5	9	19	262	18	0.1	0.105	0.155	0.005	1326	78	-1036	0.212	0.48	0.45	1	113	10	299.5	3	0	0	94	1010	7
5	9	19	262	19	-1	0.036	-9	-9	-999	18	4.4	0.212	0.48	1	0.7	117	10	299.5	3	0	0	94	1010	7
5	9	19	262	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	299.1	3	0	0	94	1011	7
5	9	19	262	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	104	10	299.1	3	0	0	94	1012	7
5	9	19	262	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	298.9	3	0	0	88	1012	7
5	9	19	262	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.9	3	0	0	94	1012	7
5	9	19	262	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.9	3	0	0	94	1012	7
5	9	20	263	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	133	10	298.8	3	0	0	94	1011	3
5	9	20	263	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.6	3	0	0	100	1011	3
5	9	20	263	3	-1.9	0.052	-9	-9	-999	27	6.7	0.687	0.8	1	0.7	167	10	298.9	3	0	0	94	1010	3
5	9	20	263	4	-1.7	0.052	-9	-9	-999	27	7.6	0.687	0.8	1	0.7	153	10	299.2	3	0	0	94	1010	7
5	9	20	263	5	-1.2	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	154	10	299.2	3	0	0	91	1011	7
5	9	20	263	6	-1.7	0.052	-9	-9	-999	27	7.6	0.687	0.8	1	0.7	148	10	299.8	3	0	0	88	1011	7
5	9	20	263	7	-0.5	0.036	-9	-9	-999	16	9	0.212	0.48	0.44	0.7	94	10	301.9	3	0	0	94	1012	0
5	9	20	263	8	55.8	0.182	0.78	0.005	306	178	-9.7	0.687	0.8	0.24	0.8	183	10	303.1	3	0	0	80	1012	8
5	9	20	263	9	84.4	0.206	1.067	0.007	520	215	-9.3	0.687	0.8	0.19	0.9	212	10	303.9	3	0	0	75	1013	9
5	9	20	263	10	61.6	0.117	1.005	0.006	595	94	-2.3	0.24	0.3	0.16	0.6	313	10	304.4	3	0	0	75	1013	9
5	9	20	263	11	115	0.298	1.328	0.006	736	373	-20.7	0.687	0.8	0.18	1.5	207	10	304.8	3	0	0	73	1012	9
5	9	20	263	12	78.3	0.159	1.206	0.005	807	156	-4.6	0.687	0.8	0.18	0.6	178	10	304.6	3	0	0	82	1011	10
5	9	20	263	13	75.4	0.231	1.208	0.005	844	255	-14.7	0.562	0.7	0.18	1.2	55	10	302.8	3	0	0	94	1010	10
5	9	20	263	14	106.3	0.253	1.384	0.005	899	293	-13.8	0.562	0.7	0.18	1.3	51	10	303.9	3	0	0	88	1009	9
5	9	20	263	15	87.5	0.235	1.327	0.005	961	262	-13.3	0.562	0.7	0.18	1.2	62	10	304.6	3	0	0	85	1008	9
5	9	20	263	16	33.7	0.187	0.975	0.005	989	186	-17.4	0.562	0.7	0.19	1	78	10	303.9	3	0	0	85	1008	10
5	9	20	263	17	3.8	0.12	0.472	0.005	991	96	-40.4	0.212	0.48	0.24	1	121	10	303.2	3	0	0	77	1008	10
5	9	20	263	18	0.1	0.115	0.14	0.005	987	90	-1368.5	0.212	0.48	0.46	1.1	100	10	301.8	3	0	0	85	1009	7
5	9	20	263	19	-2	0.052	-9	-9	-999	28	6.3	0.212	0.48	1	1	106	10	300.9	3	0	0	91	1010	7
5	9	20	263	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	105	10	300.4	3	0	0	85	1011	0
5	9	20	263	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	98	10	300	3	0	0	88	1012	7
5	9	20	263	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	299.6	3	0	0	88	1012	7
5	9	20	263	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	65	10	299.2	3	0	0	94	1011	0
5	9	20	263	24	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	124	10	298.9	3	0	0	100	1010	7
5	9	21	264	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.8	3	0	0	94	1010	7
5	9	21	264	2	-0.9	0.037	-9	-9	-999	17	5.4	0.687	0.8	1	0.5	145	10	298.9	3	0	0	97	1009	7
5	9	21	264	3	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	98	10	298.9	3	0	0	100	1009	7
5	9	21	264	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	98	10	298.8	3	0	0	100	1009	7
5	9	21	264	5	-0.6	0.026	-9	-9	-999	10	2.7	0.212	0.48	1	0.5	131	10	298.9	3	0	0	97	1010	0
5	9	21	264	6	-2.8	0.067	-9	-9	-999	40	9.7	0.687	0.8	1	0.9	140	10	300	3	0	0	94	1010	7
5	9	21	264	7	-4	0.204	-9	-9	-999	212	191.4	0.687	0.8	0.45	1.5	186	10	301.5	3	0	0	88	1011	0
5	9	21	264	8	72.5	0.377	0.97	0.005	454	532	-66.5	0.687	0.8	0.24	2.2	195	10	302.9	3	0	0	82	1012	0
5	9	21	264	9	142.5	0.332	1.61	0.005	1059	440	-23.1	0.687	0.8	0.19	1.7	190	10	304.4	3	0	0	80	1011	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	21	264	10	135.3	0.396	1.614	0.005	1123	573	-41.4	0.687	0.8	0.18	2.2	201	10	305.2	3	0	0	80	1011	8
5	9	21	264	11	162.5	0.443	1.755	0.005	1201	678	-48.2	0.687	0.8	0.18	2.5	214	10	305.5	3	0	0	70	1010	8
5	9	21	264	12	168.4	0.389	1.828	0.005	1308	560	-31.5	0.674	0.73	0.17	2.1	231	10	306.9	3	0	0	80	1010	8
5	9	21	264	13	84.1	0.248	1.475	0.005	1377	296	-16.4	0.24	0.3	0.16	1.8	263	10	306.2	3	0	0	75	1009	8
5	9	21	264	14	33.9	0.13	1.097	0.005	1402	116	-5.8	0.24	0.3	0.16	0.8	311	10	304.8	3	0	0	91	1008	10
5	9	21	264	15	25.7	0.194	1.004	0.005	1417	197	-25.7	0.562	0.7	0.18	1.1	32	10	302.4	3	0	0	82	1008	10
5	9	21	264	16	28.7	0.197	1.047	0.005	1439	200	-23.8	0.562	0.7	0.19	1.1	72	10	301.9	3	0	0	88	1008	10
5	9	21	264	17	5.5	0.114	0.605	0.005	1442	90	-23.9	0.212	0.48	0.24	0.9	100	10	301	3	0	0	85	1009	10
5	9	21	264	18	0.1	0.084	0.159	0.005	1439	57	-542.4	0.212	0.48	0.46	0.8	92	10	300	3	0	0	82	1009	7
5	9	21	264	19	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	112	10	299.4	3	0	0	88	1009	7
5	9	21	264	20	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	106	10	299.4	3	0	0	94	1010	7
5	9	21	264	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	299.4	3	0	0	100	1010	7
5	9	21	264	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	36	10	299.1	3	0	0	94	1011	7
5	9	21	264	23	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	108	10	298.8	3	0	0	97	1010	7
5	9	21	264	24	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	111	10	298.9	3	0	0	100	1010	7
5	9	22	265	1	-2.2	0.06	-9	-9	-999	34	8.7	0.687	0.8	1	0.8	158	10	299.8	3	0	0	100	1010	7
5	9	22	265	2	-1.2	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	150	10	299.9	3	0	0	97	1009	7
5	9	22	265	3	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	62	10	298.5	3	0	0	94	1009	7
5	9	22	265	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	123	10	298.6	3	0	0	94	1009	7
5	9	22	265	5	-1.7	0.052	-9	-9	-999	27	7.6	0.687	0.8	1	0.7	141	10	299.2	3	0	0	97	1009	7
5	9	22	265	6	-2.8	0.067	-9	-9	-999	40	9.7	0.687	0.8	1	0.9	151	10	300.1	3	0	0	94	1010	7
5	9	22	265	7	-2.6	0.135	-9	-9	-999	114	87.3	0.687	0.8	0.45	1.1	176	10	301.6	3	0	0	88	1011	0
5	9	22	265	8	75.3	0.298	1.07	0.005	587	375	-31.8	0.687	0.8	0.24	1.6	194	10	302.8	3	0	0	75	1012	4
5	9	22	265	9	142.6	0.318	1.48	0.005	821	412	-20.4	0.687	0.8	0.19	1.6	193	10	304.5	3	0	0	75	1012	5
5	9	22	265	10	98.2	0.372	1.353	0.005	912	522	-47.4	0.687	0.8	0.18	2.1	198	10	304.5	3	0	0	75	1012	9
5	9	22	265	11	146.2	0.373	1.62	0.005	1049	524	-32	0.687	0.8	0.18	2	195	10	305.6	3	0	0	80	1011	8
5	9	22	265	12	187.6	0.395	1.853	0.005	1225	572	-29.7	0.687	0.8	0.18	2.1	191	10	306.2	3	0	0	75	1010	8
5	9	22	265	13	208.7	0.373	2.019	0.005	1423	523	-22.3	0.687	0.8	0.18	1.9	182	10	307.2	3	0	0	85	1009	7
5	9	22	265	14	174	0.352	1.969	0.005	1583	481	-22.6	0.687	0.8	0.18	1.8	172	10	307.2	3	0	0	80	1009	8
5	9	22	265	15	118.3	0.326	1.769	0.005	1689	428	-26.3	0.687	0.8	0.18	1.7	143	10	306.9	3	0	0	64	1009	9
5	9	22	265	16	42	0.236	1.262	0.005	1722	267	-28.1	0.212	0.48	0.19	1.9	126	10	305.6	3	0	0	62	1009	10
5	9	22	265	17	6.7	0.181	0.684	0.005	1720	178	-80.2	0.212	0.48	0.24	1.6	115	10	303.5	3	0	0	70	1009	10
5	9	22	265	18	-0.9	0.127	-9	-9	-999	105	208	0.212	0.48	0.47	1.3	111	10	301.6	3	0	0	77	1009	3
5	9	22	265	19	-2.4	0.057	-9	-9	-999	33	6.9	0.212	0.48	1	1.1	101	10	300.8	3	0	0	85	1009	7
5	9	22	265	20	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	108	10	300.2	3	0	0	91	1010	0
5	9	22	265	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	112	10	299.9	3	0	0	94	1011	7
5	9	22	265	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	104	10	299.6	3	0	0	94	1011	7
5	9	22	265	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	299.4	3	0	0	94	1010	3
5	9	22	265	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	299.1	3	0	0	94	1010	3
5	9	23	266	1	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	299	3	0	0	94	1009	3
5	9	23	266	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	299	3	0	0	94	1009	3
5	9	23	266	3	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	66	10	299	3	0	0	88	1009	3
5	9	23	266	4	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	95	10	299.1	3	0	0	94	1010	3
5	9	23	266	5	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	57	10	298.5	3	0	0	91	1010	3
5	9	23	266	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	47	10	299.4	3	0	0	88	1011	3
5	9	23	266	7	-0.7	0.049	-9	-9	-999	25	15.9	0.562	0.7	0.44	0.7	64	10	302.9	3	0	0	82	1012	0
5	9	23	266	8	74.6	0.17	1.062	0.005	580	161	-6	0.212	0.48	0.24	1.1	86	10	304.5	3	0	0	75	1013	0
5	9	23	266	9	107.1	0.227	1.37	0.007	869	249	-9.9	0.212	0.48	0.19	1.6	121	10	305.5	3	0	0	66	1013	0
5	9	23	266	10	139.6	0.225	1.58	0.008	1022	245	-7.3	0.212	0.48	0.18	1.5	119	10	306.8	3	0	0	60	1013	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	23	266	11	163	0.238	1.716	0.008	1120	268	-7.5	0.212	0.48	0.18	1.6	121	10	307.9	3	0	0	66	1012	5
5	9	23	266	12	152.3	0.147	1.706	0.007	1178	132	-1.9	0.562	0.7	0.18	0.5	65	10	307.4	3	0	0	60	1011	8
5	9	23	266	13	42.1	0.279	1.116	0.007	1191	339	-46.5	0.562	0.7	0.18	1.7	347	10	304.1	3	0	0	52	1010	10
5	9	23	266	14	12.9	0.194	0.754	0.007	1196	199	-51.1	0.24	0.3	0.16	1.6	330	10	303.5	3	0	0	53	1010	10
5	9	23	266	15	0.1	0.151	0.149	0.007	1192	135	-3081.8	0.24	0.3	0.16	1.4	274	10	298.9	3	0	14.99	60	1010	10
5	9	23	266	16	1.6	0.097	0.375	0.007	1194	70	-52.2	0.562	0.7	0.19	0.6	4	10	300	3	0	0	60	1010	10
5	9	23	266	17	0.1	0.106	0.149	0.007	1193	79	-1068.3	0.687	0.8	0.25	0.7	142	10	299.6	3	0	0	66	1010	10
5	9	23	266	18	-0.7	0.049	-9	-9	-999	25	14.2	0.562	0.7	0.47	0.7	57	10	299.2	3	0	0	79	1011	3
5	9	23	266	19	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	96	10	299.2	3	0	0	85	1012	3
5	9	23	266	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	110	10	299.2	3	0	0	85	1012	0
5	9	23	266	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	299.1	3	0	0	85	1013	7
5	9	23	266	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	299.2	3	0	0	88	1013	7
5	9	23	266	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	118	10	299.2	3	0	0	97	1012	7
5	9	23	266	24	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	88	10	298.9	3	0	0	94	1012	7
5	9	24	267	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	299	3	0	0	94	1011	7
5	9	24	267	2	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	120	10	298.5	3	0	0	97	1011	7
5	9	24	267	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	131	10	298.2	3	0	0	100	1011	3
5	9	24	267	4	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	136	10	298	3	0	0	94	1011	7
5	9	24	267	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	117	10	297.8	3	0	0	97	1012	0
5	9	24	267	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	78	10	298.1	3	0	0	94	1012	7
5	9	24	267	7	-0.8	0.047	-9	-9	-999	23	11.8	0.212	0.48	0.44	0.9	94	10	301.4	3	0	0	100	1013	0
5	9	24	267	8	68.6	0.229	0.852	0.005	325	251	-15.7	0.562	0.7	0.24	1.2	81	10	302.9	3	0	0	91	1013	5
5	9	24	267	9	80.7	0.192	1.07	0.005	549	194	-7.9	0.212	0.48	0.19	1.3	96	10	303.9	3	0	0	75	1013	8
5	9	24	267	10	99.9	0.216	1.274	0.007	748	231	-9.1	0.212	0.48	0.18	1.5	90	10	304.4	3	0	0	80	1013	8
5	9	24	267	11	90.1	0.204	1.273	0.007	827	212	-8.5	0.212	0.48	0.18	1.4	99	10	304.9	3	0	0	62	1012	9
5	9	24	267	12	55.4	0.184	1.098	0.006	862	182	-10.2	0.212	0.48	0.18	1.3	110	10	304	3	0	0	59	1012	10
5	9	24	267	13	69.1	0.179	1.202	0.006	907	174	-7.5	0.212	0.48	0.18	1.2	89	10	304.4	3	0	0	61	1011	10
5	9	24	267	14	97.5	0.251	1.379	0.006	970	289	-14.6	0.562	0.7	0.18	1.3	80	10	304.9	3	0	0	63	1010	9
5	9	24	267	15	43.4	0.16	1.064	0.006	998	150	-8.5	0.212	0.48	0.18	1.1	107	10	304.4	3	0	0	66	1009	10
5	9	24	267	16	9.4	0.157	0.64	0.006	1000	143	-36.9	0.212	0.48	0.19	1.3	112	10	301.9	3	0	1.27	80	1010	10
5	9	24	267	17	0.1	0.074	0.141	0.006	998	49	-371.7	0.212	0.48	0.25	0.7	86	10	300.2	3	0	0	85	1010	10
5	9	24	267	18	0.1	0.095	0.141	0.006	997	67	-763	0.212	0.48	0.48	0.9	107	10	299.5	3	0	0	82	1011	7
5	9	24	267	19	-1.6	0.047	-9	-9	-999	24	5.6	0.212	0.48	1	0.9	106	10	299.4	3	0	0	88	1011	7
5	9	24	267	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	92	10	299.5	3	0	0	94	1012	7
5	9	24	267	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	124	10	299.2	3	0	0	88	1012	7
5	9	24	267	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	85	10	298.8	3	0	0.25	94	1013	3
5	9	24	267	23	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	99	10	298.4	3	0	0	97	1012	7
5	9	24	267	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	298.4	3	0	0	94	1011	3
5	9	25	268	1	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	78	10	298	3	0	0	94	1010	3
5	9	25	268	2	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	78	10	297.6	3	0	0	97	1010	0
5	9	25	268	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	297.4	3	0	0.25	94	1010	3
5	9	25	268	4	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	119	10	297.4	3	0	0	100	1010	7
5	9	25	268	5	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	116	10	297.2	3	0	0	100	1011	7
5	9	25	268	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	122	10	298.5	3	0	0	94	1012	7
5	9	25	268	7	-0.5	0.036	-9	-9	-999	16	9.6	0.212	0.48	0.44	0.7	105	10	302	3	0	0	94	1012	0
5	9	25	268	8	82.8	0.151	1.255	0.005	862	136	-3.8	0.212	0.48	0.24	0.9	128	10	304.4	3	0	0	82	1013	0
5	9	25	268	9	128.7	0.246	1.514	0.005	976	281	-10.5	0.687	0.8	0.19	1.1	145	10	304.6	3	0	0	70	1013	6
5	9	25	268	10	23.6	-9	-9	-9	996	-999	-99999	0.475	0.6	0.18	0	0	10	302.5	3	0	3.05	75	1013	10
5	9	25	268	11	41.3	0.138	1.056	0.005	1030	118	-5.7	0.562	0.7	0.18	0.6	72	10	299.6	3	0	0.51	85	1013	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	25	268	12	106.4	0.2	1.49	0.005	1124	205	-6.7	0.562	0.7	0.18	0.9	45	10	300.8	3	0	0.25	82	1012	9
5	9	25	268	13	102	0.213	1.509	0.005	1216	226	-8.5	0.562	0.7	0.18	1	56	10	302.9	3	0	0.25	70	1011	9
5	9	25	268	14	23.2	0.205	0.926	0.005	1235	213	-33.2	0.562	0.7	0.18	1.2	75	10	301.2	3	0	4.83	79	1011	10
5	9	25	268	15	0.9	0.139	0.313	0.005	1232	120	-273.3	0.212	0.48	0.18	1.3	112	10	299	3	0	0.76	88	1011	10
5	9	25	268	16	0.1	0.084	0.151	0.005	1230	57	-543.5	0.212	0.48	0.19	0.8	96	10	297.8	3	0	0.76	94	1011	10
5	9	25	268	17	0.1	0.153	0.151	0.005	1230	138	-3258.6	0.562	0.7	0.25	1.1	83	10	297.5	3	0	0.51	94	1010	3
5	9	25	268	18	-3.1	0.156	-9	-9	-999	142	111.6	0.562	0.7	0.48	1.3	75	10	297.4	3	0	0.25	94	1012	10
5	9	25	268	19	-5	0.097	-9	-9	-999	70	16.6	0.562	0.7	1	1.4	77	10	297.4	3	0	0.76	94	1012	10
5	9	25	268	20	-3.7	0.083	-9	-9	-999	55	14.3	0.562	0.7	1	1.2	72	10	297.2	3	0	0.25	94	1013	10
5	9	25	268	21	-3.7	0.083	-9	-9	-999	55	14.3	0.562	0.7	1	1.2	80	10	297	3	0	0	100	1013	10
5	9	25	268	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	85	10	297	3	0	0	94	1013	7
5	9	25	268	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	64	10	297.1	3	0	0	100	1013	7
5	9	25	268	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	75	10	297.1	3	0	0	94	1012	7
5	9	26	269	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.1	3	0	0	94	1012	7
5	9	26	269	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	297.2	3	0	0	97	1011	7
5	9	26	269	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	104	10	297.4	3	0	0	94	1010	7
5	9	26	269	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	297.4	3	0	0	94	1010	3
5	9	26	269	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	131	10	297.2	3	0	0	97	1010	7
5	9	26	269	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	113	10	298.5	3	0	0	94	1011	7
5	9	26	269	7	-0.7	0.047	-9	-9	-999	23	12.4	0.212	0.48	0.44	0.9	117	10	302	3	0	0	94	1012	0
5	9	26	269	8	64.3	0.244	0.875	0.005	376	278	-20.4	0.212	0.48	0.24	1.9	116	10	303.4	3	0	0	80	1012	0
5	9	26	269	9	103.7	0.312	1.244	0.005	671	401	-26.5	0.212	0.48	0.19	2.5	129	10	304.4	3	0	0	85	1012	0
5	9	26	269	10	135.9	0.31	1.488	0.006	876	397	-19.7	0.212	0.48	0.18	2.4	136	10	305.4	3	0	0	75	1012	6
5	9	26	269	11	147.1	0.322	1.608	0.006	1021	419	-20.4	0.212	0.48	0.18	2.5	119	10	305.9	3	0	0	68	1012	7
5	9	26	269	12	137	0.31	1.61	0.006	1100	397	-19.6	0.212	0.48	0.18	2.4	119	10	306	3	0	0	66	1011	8
5	9	26	269	13	141.4	0.33	1.667	0.007	1182	436	-22.9	0.212	0.48	0.18	2.6	127	10	306	3	0	0	62	1010	7
5	9	26	269	14	126.5	0.308	1.639	0.007	1255	393	-20.8	0.212	0.48	0.18	2.4	130	10	306.2	3	0	0	62	1009	8
5	9	26	269	15	58.3	0.242	1.277	0.006	1286	276	-21.9	0.212	0.48	0.18	1.9	126	10	304.5	3	0	0.25	66	1009	9
5	9	26	269	16	35.5	0.233	1.087	0.006	1306	258	-31.9	0.212	0.48	0.19	1.9	128	10	304.4	3	0	0	62	1010	10
5	9	26	269	17	8.5	0.201	0.675	0.006	1307	207	-85.8	0.687	0.8	0.25	1.2	142	10	302.6	3	0	0	66	1010	10
5	9	26	269	18	0.1	0.136	0.154	0.006	1304	116	-2243.3	0.212	0.48	0.49	1.3	109	10	300.9	3	0	0	79	1010	7
5	9	26	269	19	-2.5	0.063	-9	-9	-999	38	8.7	0.562	0.7	1	0.9	80	10	299.6	3	0	0	82	1011	7
5	9	26	269	20	-4.2	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	80	10	299	3	0	0	85	1012	3
5	9	26	269	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	298.8	3	0	0	94	1012	3
5	9	26	269	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	64	10	298.5	3	0	0	94	1012	3
5	9	26	269	23	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	74	10	298.4	3	0	0	88	1012	3
5	9	26	269	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	54	10	298	3	0	0	94	1012	3
5	9	27	270	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	298.2	3	0	0	94	1012	3
5	9	27	270	2	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	81	10	298.5	3	0	0	97	1011	3
5	9	27	270	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	99	10	298.4	3	0	0	95	1011	3
5	9	27	270	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	91	10	298.4	3	0	0	94	1011	3
5	9	27	270	5	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	74	10	298.1	3	0	0	97	1012	3
5	9	27	270	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	71	10	298.2	3	0	0	94	1012	3
5	9	27	270	7	-1.9	0.094	-9	-9	-999	66	39.8	0.212	0.48	0.44	1.2	86	10	300.4	3	0	0	94	1013	0
5	9	27	270	8	72.8	0.219	0.851	0.005	306	236	-13	0.212	0.48	0.24	1.6	106	10	303.8	3	0	0	82	1013	0
5	9	27	270	9	114.2	0.296	1.2	0.005	547	370	-20.4	0.212	0.48	0.19	2.3	114	10	305	3	0	0	70	1013	0
5	9	27	270	10	136	0.3	1.465	0.005	836	379	-18	0.212	0.48	0.18	2.3	124	10	305.6	3	0	0	62	1013	5
5	9	27	270	11	148.8	0.322	1.68	0.005	1152	420	-20.2	0.212	0.48	0.18	2.5	127	10	306.2	3	0	0	70	1013	6
5	9	27	270	12	157.9	0.324	1.752	0.005	1231	423	-19.3	0.212	0.48	0.18	2.5	128	10	306.2	3	0	0	64	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	27	270	13	100.6	0.283	1.527	0.005	1279	347	-20.3	0.212	0.48	0.18	2.2	123	10	304.9	3	0	0.76	66	1011	9
5	9	27	270	14	39.5	0.216	1.124	0.005	1294	232	-22.9	0.212	0.48	0.18	1.7	128	10	302	3	0	0	91	1010	10
5	9	27	270	15	41.3	0.216	1.147	0.005	1316	232	-22.1	0.212	0.48	0.18	1.7	119	10	302.9	3	0	0	75	1009	10
5	9	27	270	16	25.7	0.189	0.982	0.005	1327	190	-23.8	0.212	0.48	0.19	1.5	114	10	302.4	3	0	0	72	1010	10
5	9	27	270	17	1.8	0.152	0.403	0.005	1327	137	-179.5	0.212	0.48	0.25	1.4	120	10	301.9	3	0	0	70	1010	10
5	9	27	270	18	-1.7	0.062	-9	-9	-999	40	12.6	0.212	0.48	0.49	1.2	93	10	300.9	3	0	0	79	1011	3
5	9	27	270	19	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	81	10	300	3	0	0	82	1012	7
5	9	27	270	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	100	10	299.5	3	0	0	85	1012	7
5	9	27	270	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	118	10	299.5	3	0	0	88	1013	7
5	9	27	270	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	106	10	299.8	3	0	0	94	1013	7
5	9	27	270	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	63	10	299.4	3	0	0	91	1013	7
5	9	27	270	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	298.6	3	0	0	88	1012	7
5	9	28	271	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.4	3	0	0	88	1012	7
5	9	28	271	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	298.9	3	0	0	94	1011	7
5	9	28	271	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	75	10	298.8	3	0	0	91	1011	7
5	9	28	271	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	61	10	298.4	3	0	0	88	1011	7
5	9	28	271	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	69	10	298.1	3	0	0	97	1012	7
5	9	28	271	6	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	79	10	299.6	3	0	0	94	1012	3
5	9	28	271	7	-1.3	0.092	-9	-9	-999	64	52.5	0.212	0.48	0.44	1.1	90	10	302.5	3	0	0	88	1013	0
5	9	28	271	8	67.6	0.236	1.145	0.006	804	263	-17.5	0.212	0.48	0.24	1.8	118	10	304.2	3	0	0	80	1013	0
5	9	28	271	9	118.8	0.278	1.426	0.006	882	337	-16.4	0.212	0.48	0.19	2.1	129	10	305.4	3	0	0	70	1013	0
5	9	28	271	10	123	0.26	1.485	0.006	964	305	-12.9	0.212	0.48	0.18	1.9	128	10	306	3	0	0	66	1013	7
5	9	28	271	11	145.9	0.303	1.624	0.006	1061	383	-17.2	0.212	0.48	0.18	2.3	121	10	306.2	3	0	0	60	1012	7
5	9	28	271	12	78.8	0.268	1.344	0.006	1113	319	-22	0.212	0.48	0.18	2.1	137	10	306	3	0	0	60	1011	9
5	9	28	271	13	21.9	0.243	0.881	0.006	1124	275	-58.7	0.687	0.8	0.18	1.4	202	10	302.9	3	0	0	56	1010	10
5	9	28	271	14	29.5	0.118	0.978	0.006	1142	101	-5	0.562	0.7	0.18	0.5	70	10	302.4	3	0	0	68	1010	10
5	9	28	271	15	75.8	0.256	1.359	0.006	1195	298	-20	0.562	0.7	0.18	1.4	85	10	304.1	3	0	0	70	1010	9
5	9	28	271	16	23.4	0.188	0.922	0.006	1209	188	-25.6	0.212	0.48	0.19	1.5	99	10	303.6	3	0	0	75	1010	10
5	9	28	271	17	1.9	0.143	0.4	0.006	1208	125	-138.4	0.212	0.48	0.25	1.3	108	10	302.2	3	0	0	75	1011	10
5	9	28	271	18	0.1	0.105	0.15	0.006	1206	78	-1037	0.212	0.48	0.5	1	99	10	301.1	3	0	0	80	1011	7
5	9	28	271	19	-1.6	0.047	-9	-9	-999	24	5.6	0.212	0.48	1	0.9	105	10	300.4	3	0	0	85	1012	7
5	9	28	271	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	86	10	300	3	0	0	85	1013	0
5	9	28	271	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	91	10	299.6	3	0	0	82	1014	7
5	9	28	271	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	69	10	299.2	3	0	0	88	1014	7
5	9	28	271	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	298.9	3	0	0	94	1013	7
5	9	28	271	24	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	86	10	298.8	3	0	0	94	1013	7
5	9	29	272	1	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	83	10	298.4	3	0	0	88	1013	7
5	9	29	272	2	-6.1	0.097	-9	-9	-999	70	13.6	0.562	0.7	1	1.4	26	10	298.2	3	0	0	85	1013	7
5	9	29	272	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	298	3	0	0	88	1012	7
5	9	29	272	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	137	10	297.6	3	0	0	88	1012	3
5	9	29	272	5	-1.7	0.052	-9	-9	-999	27	7.5	0.687	0.8	1	0.7	142	10	297.5	3	0	0	94	1013	7
5	9	29	272	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	131	10	298.9	3	0	0	94	1013	7
5	9	29	272	7	-0.7	0.047	-9	-9	-999	23	12.5	0.212	0.48	0.44	0.9	118	10	301.9	3	0	0	88	1014	0
5	9	29	272	8	50.5	-9	-9	-9	362	-999	-99999	0.475	0.6	0.23	0	0	10	302.5	3	0	0	77	1014	8
5	9	29	272	9	51	0.196	1.007	0.005	725	199	-13.3	0.562	0.7	0.19	1	353	10	301.6	3	0	0	75	1015	10
5	9	29	272	10	42.8	0.1	1.038	0.006	946	76	-2.1	0.24	0.3	0.16	0.5	292	10	302.9	3	0	0	66	1015	9
5	9	29	272	11	80.1	0.133	1.355	0.006	1124	111	-2.6	0.24	0.3	0.16	0.7	278	10	304.4	3	0	0	60	1013	8
5	9	29	272	12	109.8	0.228	1.517	0.005	1149	250	-9.7	0.562	0.7	0.18	1.1	353	10	303.4	3	0	0	58	1012	9
5	9	29	272	13	98.5	0.238	1.473	0.005	1171	267	-12.3	0.562	0.7	0.18	1.2	352	10	303.4	3	0	0	62	1011	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	9	29	272	14	92.4	0.237	1.451	0.005	1192	265	-12.9	0.562	0.7	0.18	1.2	11	10	303	3	0	0	66	1010	9
5	9	29	272	15	134.7	0.26	1.659	0.005	1224	305	-11.7	0.562	0.7	0.18	1.3	344	10	304.9	3	0	0	62	1010	7
5	9	29	272	16	69.2	0.241	1.335	0.005	1239	273	-18.3	0.562	0.7	0.19	1.3	357	10	304.5	3	0	0	70	1010	9
5	9	29	272	17	2.3	0.176	0.429	0.005	1238	170	-212.6	0.562	0.7	0.25	1.2	69	10	302	3	0	0	79	1010	10
5	9	29	272	18	-0.7	0.191	-9	-9	-999	192	911.6	0.562	0.7	0.5	1.4	83	10	300.4	3	0	0	85	1010	7
5	9	29	272	19	-4.4	0.073	-9	-9	-999	55	7.8	0.212	0.48	1	1.4	86	10	299.6	3	0	0	88	1010	3
5	9	29	272	20	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	87	10	299.2	3	0	0	94	1011	3
5	9	29	272	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	91	10	299	3	0	0	94	1012	3
5	9	29	272	22	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	86	10	299.1	3	0	0	94	1012	7
5	9	29	272	23	-5.3	0.09	-9	-9	-999	62	12.6	0.562	0.7	1	1.3	85	10	298.9	3	0	0	88	1012	7
5	9	29	272	24	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	80	10	298.8	3	0	0	94	1011	3
5	9	30	273	1	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	91	10	298.5	3	0	0	94	1011	3
5	9	30	273	2	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	83	10	298.4	3	0	0	94	1010	3
5	9	30	273	3	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	94	10	298.2	3	0	0	94	1010	3
5	9	30	273	4	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	77	10	298	3	0	0	94	1010	3
5	9	30	273	5	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	59	10	297.5	3	0	0	94	1012	3
5	9	30	273	6	2	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.9	3	0	0	94	1013	7
5	9	30	273	7	5	-9	-9	-9	186	-999	-99999	0.475	0.6	0.44	0	0	10	299.6	3	0	4.83	88	1013	7
5	9	30	273	8	71.2	0.163	0.884	0.005	351	151	-5.5	0.562	0.7	0.24	0.7	84	10	302.1	3	0	0	82	1013	3
5	9	30	273	9	96.5	0.175	1.154	0.005	575	169	-5	0.212	0.48	0.19	1.1	101	10	303.6	3	0	0	75	1013	6
5	9	30	273	10	77.4	0.161	1.175	0.006	756	149	-4.9	0.212	0.48	0.18	1	114	10	304	3	0	0	66	1013	9
5	9	30	273	11	66.2	0.161	1.175	0.006	885	149	-5.7	0.562	0.7	0.18	0.7	344	10	303.4	3	0	0	61	1012	10
5	9	30	273	12	58.3	0.224	1.153	0.005	950	244	-17.4	0.562	0.7	0.18	1.2	7	10	302.8	3	0	0	66	1011	10
5	9	30	273	13	39.2	0.216	1.019	0.005	972	230	-23	0.562	0.7	0.18	1.2	2	10	302.6	3	0	0	62	1010	10
5	9	30	273	14	21.4	0.166	0.836	0.005	982	156	-19.2	0.562	0.7	0.18	0.9	42	10	301.4	3	0	5.33	62	1009	10
5	9	30	273	15	67.4	0.189	1.241	0.005	1020	189	-9	0.562	0.7	0.18	0.9	38	10	302.6	3	0	0	66	1009	10
5	9	30	273	16	42.5	0.179	1.072	0.005	1044	174	-12.1	0.562	0.7	0.19	0.9	43	10	303.4	3	0	0	94	1009	10
5	9	30	273	17	4.1	0.168	0.491	0.005	1045	158	-104	0.562	0.7	0.25	1.1	29	10	302.1	3	0	0	85	1009	10
5	9	30	273	18	-0.8	0.095	-9	-9	-999	69	102.1	0.562	0.7	0.51	0.8	52	10	300.4	3	0	0.25	85	1010	7
5	9	30	273	19	-1.1	0.036	-9	-9	-999	17	3.9	0.212	0.48	1	0.7	90	10	299.6	3	0	0	88	1010	3
5	9	30	273	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	299.4	3	0	0	88	1011	7
5	9	30	273	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	101	10	299	3	0	0	88	1012	7
5	9	30	273	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	98	10	298.9	3	0	0	94	1012	7
5	9	30	273	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	91	10	298.6	3	0	0	94	1011	7
5	9	30	273	24	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	76	10	298.2	3	0	0	94	1010	0
5	10	1	274	1	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	81	10	297.9	3	0	0	94	1010	0
5	10	1	274	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	100	10	297.5	3	0	0	100	1009	3
5	10	1	274	3	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	100	10	297.4	3	0	0	94	1009	0
5	10	1	274	4	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	101	10	297.4	3	0	0	94	1009	0
5	10	1	274	5	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	60	10	296.9	3	0	0	97	1010	3
5	10	1	274	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	59	10	298.5	3	0	0	97	1010	3
5	10	1	274	7	-2.7	0.161	-9	-9	-999	148	140	0.562	0.7	0.44	1.3	72	10	301.4	3	0	0	88	1011	0
5	10	1	274	8	77	0.2	0.825	0.005	263	206	-9.4	0.212	0.48	0.24	1.4	106	10	303.6	3	0	0	77	1012	0
5	10	1	274	9	123.2	0.212	1.219	0.005	532	224	-6.9	0.212	0.48	0.19	1.4	108	10	305.4	3	0	0	70	1012	0
5	10	1	274	10	130.6	0.161	1.438	0.005	823	149	-2.9	0.212	0.48	0.18	0.9	116	10	306.5	3	0	0	62	1012	6
5	10	1	274	11	86.5	0.208	1.299	0.005	914	219	-9.4	0.562	0.7	0.18	1	350	10	305.6	3	0	0	58	1011	9
5	10	1	274	12	43.8	0.267	1.052	0.005	958	318	-39.3	0.562	0.7	0.18	1.6	343	10	303.9	3	0	0	60	1010	10
5	10	1	274	13	36.1	0.263	1	0.005	997	311	-45.4	0.562	0.7	0.18	1.6	349	10	303.8	3	0	0	60	1009	10
5	10	1	274	14	2	0.162	0.382	0.005	993	154	-189.9	0.562	0.7	0.18	1.1	82	10	300.6	3	0	13.97	60	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	1	274	15	17.9	0.188	0.795	0.005	1008	187	-33.1	0.562	0.7	0.18	1.1	60	10	298.6	3	0	2.79	66	1009	10
5	10	1	274	16	30.1	0.146	0.956	0.005	1045	129	-9.3	0.562	0.7	0.19	0.7	66	10	301.2	3	0	0	80	1009	10
5	10	1	274	17	3.5	0.141	0.47	0.005	1048	122	-71.5	0.562	0.7	0.25	0.9	84	10	301.2	3	0	0	70	1009	10
5	10	1	274	18	-1	0.042	-9	-9	-999	28	6.8	0.212	0.48	0.51	0.8	93	10	300.1	3	0	0	70	1009	3
5	10	1	274	19	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	101	10	299.5	3	0	0	79	1010	3
5	10	1	274	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	299.1	3	0	0	77	1011	3
5	10	1	274	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	298.8	3	0	0	999	1011	3
5	10	1	274	22	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	100	10	298.5	3	0	0	999	1011	99
5	10	1	274	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	83	10	298.1	3	0	0	999	1010	99
5	10	1	274	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	84	10	297.5	3	0	0	999	1010	99
5	10	2	275	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.5	104	10	297.1	3	0	0	999	1009	99
5	10	2	275	2	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	62	10	296.9	3	0	0	999	1009	99
5	10	2	275	3	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	88	10	297.1	3	0	0	999	1009	99
5	10	2	275	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	297.4	3	0	0	94	1009	3
5	10	2	275	5	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	87	10	297.4	3	0	0	97	1009	0
5	10	2	275	6	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	94	10	299.1	3	0	0	100	1010	3
5	10	2	275	7	-0.7	0.047	-9	-9	-999	23	13	0.212	0.48	0.44	0.9	92	10	302	3	0	0	88	1011	0
5	10	2	275	8	75.6	0.181	1.117	0.008	666	177	-7	0.212	0.48	0.24	1.2	114	10	303.8	3	0	0	79	1011	0
5	10	2	275	9	109.8	0.209	1.308	0.007	737	219	-7.5	0.212	0.48	0.19	1.4	138	10	304.9	3	0	0	75	1012	0
5	10	2	275	10	136.1	0.203	1.455	0.006	817	211	-5.6	0.212	0.48	0.18	1.3	120	10	305.9	3	0	0	62	1011	5
5	10	2	275	11	99.7	0.144	1.336	0.005	863	127	-2.7	0.212	0.48	0.18	0.8	102	10	306.1	3	0	0	60	1010	9
5	10	2	275	12	41.7	0.133	1.006	0.005	881	112	-5.1	0.24	0.3	0.16	0.8	256	10	305.4	3	0	0	52	1009	10
5	10	2	275	13	104.7	0.264	1.391	0.005	926	311	-15.7	0.24	0.3	0.16	1.9	264	10	306.6	3	0	0	52	1008	7
5	10	2	275	14	98.5	0.192	1.384	0.005	969	194	-6.4	0.24	0.3	0.16	1.2	301	10	307.4	3	0	0	46	1008	7
5	10	2	275	15	62.4	0.202	1.199	0.005	995	209	-11.9	0.24	0.3	0.16	1.4	302	10	306.9	3	0	0	51	1008	8
5	10	2	275	16	36.2	0.176	1.003	0.005	1005	170	-13.5	0.562	0.7	0.2	0.9	48	10	302.1	3	0	5.84	60	1008	10
5	10	2	275	17	2.9	0.165	0.432	0.005	1004	154	-139.5	0.562	0.7	0.26	1.1	78	10	300	3	0	0	88	1009	10
5	10	2	275	18	-2.4	0.12	-9	-9	-999	96	64.1	0.562	0.7	0.52	1.1	78	10	298.9	3	0	0	88	1009	7
5	10	2	275	19	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	78	10	298.8	3	0	0	82	1010	7
5	10	2	275	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.6	3	0	0	91	1011	7
5	10	2	275	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	102	10	298.4	3	0	0	88	1011	7
5	10	2	275	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	84	10	298.4	3	0	0	94	1010	7
5	10	2	275	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	75	10	298.1	3	0	0	94	1010	7
5	10	2	275	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	297.9	3	0	0	88	1009	7
5	10	3	276	1	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	85	10	297.6	3	0	0	94	1009	7
5	10	3	276	2	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	80	10	297.5	3	0	0	90	1008	0
5	10	3	276	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	80	10	297.6	3	0	0	94	1008	7
5	10	3	276	4	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	104	10	297.4	3	0	0	100	1009	0
5	10	3	276	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	120	10	297.6	3	0	0	97	1009	7
5	10	3	276	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	298.5	3	0	0	100	1010	7
5	10	3	276	7	-0.4	0.036	-9	-9	-999	16	10	0.212	0.48	0.44	0.7	114	10	301.9	3	0	0	94	1010	0
5	10	3	276	8	90.3	0.222	0.999	0.005	398	241	-10.9	0.687	0.8	0.24	1	141	10	303.9	3	0	0	85	1011	0
5	10	3	276	9	120.2	0.19	1.374	0.009	779	191	-5.2	0.212	0.48	0.19	1.2	127	10	305.4	3	0	0	70	1012	0
5	10	3	276	10	111	0.189	1.368	0.008	832	188	-5.4	0.212	0.48	0.18	1.2	118	10	305.9	3	0	0	66	1011	7
5	10	3	276	11	93.4	-9	-9	-9	876	-999	-99999	0.475	0.6	0.17	0	0	10	305.9	3	0	0	62	1010	9
5	10	3	276	12	93	0.162	1.334	0.006	918	149	-4.1	0.674	0.73	0.17	0.6	246	10	305.2	3	0	0	52	1009	10
5	10	3	276	13	118.8	0.403	1.476	0.005	974	589	-49.6	0.674	0.73	0.17	2.3	221	10	305.9	3	0	0	52	1008	9
5	10	3	276	14	109	0.308	1.459	0.005	1025	398	-24.1	0.674	0.73	0.17	1.6	244	10	306	3	0	0	64	1007	9
5	10	3	276	15	38.2	0.11	1.034	0.005	1042	127	-3.1	0.24	0.3	0.16	0.6	289	10	305.1	3	0	0	64	1007	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	3	276	16	25.7	0.194	0.909	0.005	1051	197	-25.7	0.562	0.7	0.2	1.1	41	10	303.2	3	0	0	82	1007	10
5	10	3	276	17	3.9	0.167	0.484	0.005	1051	157	-108.5	0.562	0.7	0.26	1.1	79	10	301.9	3	0	0	85	1007	10
5	10	3	276	18	-2.2	0.126	-9	-9	-999	103	82.1	0.562	0.7	0.52	1.1	79	10	300.6	3	0	0	88	1007	7
5	10	3	276	19	-2.4	0.057	-9	-9	-999	33	6.9	0.212	0.48	1	1.1	92	10	299.9	3	0	0	88	1008	7
5	10	3	276	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	299.5	3	0	0	91	1009	0
5	10	3	276	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	84	10	299.4	3	0	0	88	1009	7
5	10	3	276	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	103	10	298.9	3	0	0	88	1010	7
5	10	3	276	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	97	10	299	3	0	0	91	1010	7
5	10	3	276	24	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	116	10	298.9	3	0	0	94	1009	3
5	10	4	277	1	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	125	10	298.8	3	0	0	94	1009	3
5	10	4	277	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	123	10	298.8	3	0	0	97	1008	0
5	10	4	277	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	298.1	3	0	0	94	1008	3
5	10	4	277	4	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	69	10	297.5	3	0	0	100	1009	3
5	10	4	277	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	95	10	297.5	3	0	0	97	1009	0
5	10	4	277	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	128	10	298.8	3	0	0	94	1010	3
5	10	4	277	7	-0.3	0.031	-9	-9	-999	13	8.8	0.212	0.48	0.44	0.6	120	10	302.2	3	0	0	94	1010	0
5	10	4	277	8	77.8	0.232	0.815	0.005	251	257	-14.5	0.687	0.8	0.24	1.1	156	10	303.6	3	0	0	80	1011	4
5	10	4	277	9	132.9	0.261	1.31	0.005	611	306	-12	0.687	0.8	0.19	1.2	162	10	304.9	3	0	0	75	1011	6
5	10	4	277	10	96.9	0.209	1.266	0.005	755	221	-8.5	0.687	0.8	0.18	0.9	142	10	305.5	3	0	0	66	1011	9
5	10	4	277	11	165.2	0.253	1.627	0.005	942	293	-8.9	0.687	0.8	0.18	1.1	178	10	306.4	3	0	0	64	1010	8
5	10	4	277	12	205.8	0.436	1.885	0.005	1175	662	-36.2	0.674	0.73	0.17	2.4	222	10	307.4	3	0	0	56	1010	7
5	10	4	277	13	152.6	0.359	1.786	0.005	1345	499	-27.3	0.674	0.73	0.17	1.9	244	10	306.8	3	0	0	49	1009	8
5	10	4	277	14	67.1	-9	-9	-9	1407	-999	-99999	0.475	0.6	0.17	0	0	10	302.4	3	0	6.86	70	1008	10
5	10	4	277	15	66.8	0.278	1.4	0.005	1479	337	-28.9	0.562	0.7	0.18	1.6	54	10	301.9	3	0	0	88	1008	9
5	10	4	277	16	64.3	0.239	1.404	0.005	1551	270	-19.2	0.562	0.7	0.2	1.3	82	10	302.9	3	0	0	88	1008	9
5	10	4	277	17	10.1	0.216	0.76	0.005	1554	231	-89.1	0.562	0.7	0.26	1.4	81	10	300.9	3	0	0	88	1008	10
5	10	4	277	18	-1.9	0.07	-9	-9	-999	64	16.8	0.212	0.48	0.53	1.2	86	10	299	3	0	0	88	1009	7
5	10	4	277	19	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	79	10	298.9	3	0	0	94	1009	7
5	10	4	277	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	298.4	3	0	0	97	1010	7
5	10	4	277	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	298.5	3	0	0	94	1010	7
5	10	4	277	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	89	10	298.6	3	0	0	100	1011	7
5	10	4	277	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	106	10	298.4	3	0	0	97	1011	7
5	10	4	277	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	88	10	298.6	3	0	0	100	1010	7
5	10	5	278	1	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	78	10	298.4	3	0	0	100	1010	7
5	10	5	278	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	298.2	3	0	0	97	1009	7
5	10	5	278	3	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	101	10	298.4	3	0	0	94	1009	7
5	10	5	278	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	298.2	3	0	0	100	1009	7
5	10	5	278	5	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	124	10	298.4	3	0	0	100	1009	7
5	10	5	278	6	-1.2	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	156	10	299.2	3	0	0	100	1010	7
5	10	5	278	7	-1.5	0.107	-9	-9	-999	81	74.6	0.687	0.8	0.44	0.9	147	10	302.5	3	0	0	94	1011	0
5	10	5	278	8	94.3	0.305	1.278	0.006	798	388	-27.2	0.687	0.8	0.24	1.6	158	10	304.2	3	0	0	80	1011	0
5	10	5	278	9	145.2	0.278	1.565	0.006	954	337	-13.3	0.687	0.8	0.19	1.3	167	10	305.8	3	0	0	75	1012	4
5	10	5	278	10	197	0.316	1.834	0.007	1131	409	-14.5	0.687	0.8	0.18	1.5	177	10	306.9	3	0	0	66	1012	4
5	10	5	278	11	218.8	0.361	1.953	0.007	1230	498	-19.3	0.687	0.8	0.18	1.8	180	10	307.4	3	0	0	60	1011	6
5	10	5	278	12	186.6	0.328	1.894	0.007	1314	433	-17.1	0.687	0.8	0.18	1.6	164	10	307.6	3	0	0	52	1010	8
5	10	5	278	13	174.4	0.352	1.888	0.007	1393	481	-22.6	0.687	0.8	0.18	1.8	166	10	307.6	3	0	0	64	1009	8
5	10	5	278	14	44.3	0.18	1.201	0.006	1410	196	-11.8	0.212	0.48	0.18	1.3	101	10	305.6	3	0	0	72	1009	10
5	10	5	278	15	5.3	0.234	0.591	0.007	1403	260	-217.9	0.562	0.7	0.18	1.6	10	10	299.8	3	0	4.83	74	1009	10
5	10	5	278	16	12.6	0.157	0.79	0.006	1409	145	-27.8	0.562	0.7	0.2	0.9	85	10	299.9	3	0	0	78	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	5	278	17	0.8	0.119	0.315	0.006	1409	95	-191.8	0.212	0.48	0.26	1.1	89	10	299.9	3	0	0	82	1009	10
5	10	5	278	18	-0.9	0.047	-9	-9	-999	25	9.7	0.212	0.48	0.53	0.9	88	10	299.8	3	0	0	85	1009	7
5	10	5	278	19	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	299.4	3	0	0	85	1009	7
5	10	5	278	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	89	10	299.4	3	0	0	85	1010	0
5	10	5	278	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	100	10	298.9	3	0	0	82	1011	7
5	10	5	278	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	298.8	3	0	0	82	1011	7
5	10	5	278	23	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	84	10	298.5	3	0	0	88	1011	0
5	10	5	278	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	82	10	298.1	3	0	0	88	1010	7
5	10	6	279	1	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	82	10	298.1	3	0	0	94	1010	7
5	10	6	279	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	64	10	297.9	3	0	0	94	1009	0
5	10	6	279	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	41	10	297.4	3	0	0	94	1009	3
5	10	6	279	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.1	3	0	0	94	1009	3
5	10	6	279	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.4	3	0	0	91	1010	3
5	10	6	279	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.1	3	0	0	94	1010	7
5	10	6	279	7	-1.3	0.094	-9	-9	-999	66	59.2	0.212	0.48	0.44	1.1	126	10	302.6	3	0	0	88	1011	0
5	10	6	279	8	68.8	0.236	0.904	0.005	388	264	-17.3	0.212	0.48	0.24	1.8	138	10	304	3	0	0	77	1012	0
5	10	6	279	9	140.8	0.345	1.474	0.005	821	466	-26.3	0.687	0.8	0.19	1.8	153	10	305	3	0	0	70	1012	5
5	10	6	279	10	194.5	0.384	1.77	0.006	1032	546	-26.2	0.687	0.8	0.18	2	166	10	306.1	3	0	0	58	1012	4
5	10	6	279	11	208	0.4	1.884	0.006	1162	581	-27.7	0.687	0.8	0.18	2.1	149	10	306.8	3	0	0	58	1012	6
5	10	6	279	12	206.7	0.386	1.948	0.006	1291	552	-25.1	0.687	0.8	0.18	2	149	10	307.4	3	0	0	56	1011	7
5	10	6	279	13	186	0.408	1.936	0.005	1407	600	-33	0.687	0.8	0.18	2.2	149	10	307	3	0	0	54	1010	7
5	10	6	279	14	171.6	0.418	1.931	0.005	1514	622	-38.3	0.687	0.8	0.18	2.3	151	10	307	3	0	0	56	1009	7
5	10	6	279	15	109.5	0.39	1.68	0.005	1560	560	-48.6	0.687	0.8	0.18	2.2	145	10	306.4	3	0	0	58	1009	9
5	10	6	279	16	38.6	0.234	1.19	0.005	1574	275	-30	0.212	0.48	0.2	1.9	134	10	305.2	3	0	0	58	1008	9
5	10	6	279	17	3.5	0.166	0.536	0.005	1571	157	-117.4	0.212	0.48	0.26	1.5	118	10	302.9	3	0	0	65	1009	10
5	10	6	279	18	-2	0.057	-9	-9	-999	41	8.2	0.212	0.48	0.54	1.1	107	10	300.9	3	0	0	75	1009	3
5	10	6	279	19	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	300.2	3	0	0	79	1010	3
5	10	6	279	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	86	10	299.6	3	0	0	82	1010	0
5	10	6	279	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	299.4	3	0	0	82	1011	3
5	10	6	279	22	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	84	10	299.4	3	0	0	88	1011	3
5	10	6	279	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	90	10	299.4	3	0	0	88	1011	0
5	10	6	279	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	92	10	299	3	0	0	94	1010	3
5	10	7	280	1	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	91	10	298.6	3	0	0	88	1010	3
5	10	7	280	2	-0.6	0.026	-9	-9	-999	10	2.7	0.212	0.48	1	0.5	92	10	298.5	3	0	0	91	1010	0
5	10	7	280	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	74	10	298.5	3	0	0	88	1010	3
5	10	7	280	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.4	3	0	0	88	1010	3
5	10	7	280	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	88	1010	0
5	10	7	280	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	300.1	3	0	0	88	1011	3
5	10	7	280	7	-1.8	0.143	-9	-9	-999	125	152	0.212	0.48	0.44	1.5	132	10	303	3	0	0	85	1012	0
5	10	7	280	8	84.8	0.368	1.297	0.007	930	514	-53.1	0.687	0.8	0.24	2.1	141	10	304.2	3	0	0	77	1012	0
5	10	7	280	9	127.2	0.394	1.516	0.007	991	569	-43.4	0.687	0.8	0.19	2.2	140	10	305.2	3	0	0	70	1013	7
5	10	7	280	10	178.7	0.42	1.748	0.005	1081	625	-37.3	0.687	0.8	0.18	2.3	144	10	306.5	3	0	0	64	1013	6
5	10	7	280	11	114.6	0.296	1.535	0.005	1140	378	-20.4	0.212	0.48	0.18	2.3	136	10	306.2	3	0	0	62	1012	8
5	10	7	280	12	181.9	0.447	1.839	0.005	1236	687	-44.2	0.687	0.8	0.18	2.5	141	10	306.9	3	0	0	64	1011	8
5	10	7	280	13	202.7	0.451	1.961	0.005	1343	697	-40.8	0.687	0.8	0.18	2.5	154	10	307.4	3	0	0	70	1010	7
5	10	7	280	14	147.1	0.439	1.795	0.005	1419	670	-51.9	0.687	0.8	0.18	2.5	147	10	306.9	3	0	0	72	1009	8
5	10	7	280	15	90.5	0.28	1.567	0.005	1534	358	-21.9	0.212	0.48	0.18	2.2	125	10	306.6	3	0	0	70	1009	8
5	10	7	280	16	39.7	0.263	1.198	0.005	1562	310	-41.1	0.212	0.48	0.2	2.2	118	10	304.6	3	0	0	70	1009	9
5	10	7	280	17	6.2	0.209	0.647	0.005	1562	221	-132.5	0.212	0.48	0.26	1.9	126	10	303	3	0	0	77	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	7	280	18	-1.7	0.062	-9	-9	-999	60	12.9	0.212	0.48	0.54	1.2	113	10	301.5	3	0	0	80	1010	7
5	10	7	280	19	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	109	10	300.6	3	0	0	85	1010	7
5	10	7	280	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	106	10	300.4	3	0	0	88	1011	7
5	10	7	280	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	66	10	299.9	3	0	0	88	1012	7
5	10	7	280	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	32	10	299.2	3	0	0	88	1012	7
5	10	7	280	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	58	10	298.9	3	0	0	85	1012	7
5	10	7	280	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	46	10	298.8	3	0	0	88	1012	7
5	10	8	281	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	298.5	3	0	0	94	1011	7
5	10	8	281	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	298.5	3	0	0	91	1010	7
5	10	8	281	3	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	99	10	298.2	3	0	0	88	1011	7
5	10	8	281	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	66	10	298.4	3	0	0	94	1011	7
5	10	8	281	5	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	85	10	298.5	3	0	0	94	1012	0
5	10	8	281	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	85	10	300.4	3	0	0	94	1013	7
5	10	8	281	7	-1.2	0.095	-9	-9	-999	67	63.8	0.212	0.48	0.44	1.1	118	10	302.9	3	0	0	88	1013	0
5	10	8	281	8	101.9	0.347	1.06	0.005	423	470	-37	0.687	0.8	0.24	1.9	149	10	304.4	3	0	0	80	1014	0
5	10	8	281	9	145.2	0.359	1.497	0.007	836	495	-28.9	0.687	0.8	0.19	1.9	152	10	305.8	3	0	0	66	1014	4
5	10	8	281	10	176.8	0.353	1.72	0.007	1043	482	-22.4	0.687	0.8	0.18	1.8	152	10	306.8	3	0	0	60	1014	6
5	10	8	281	11	169.6	0.365	1.732	0.006	1108	507	-25.9	0.687	0.8	0.18	1.9	176	10	306.9	3	0	0	60	1013	8
5	10	8	281	12	173.4	0.445	1.779	0.005	1174	682	-45.8	0.687	0.8	0.18	2.5	154	10	306.4	3	0	0	60	1012	8
5	10	8	281	13	85.7	0.395	1.419	0.005	1203	572	-64.7	0.687	0.8	0.18	2.3	148	10	303.5	3	0	0.25	67	1012	10
5	10	8	281	14	9.5	0.157	0.683	0.005	1205	203	-36.6	0.212	0.48	0.18	1.3	111	10	301.8	3	0	0	77	1011	10
5	10	8	281	15	6	-9	-9	-9	1208	-999	-99999	0.475	0.6	0.18	0	0	10	302	3	0	0	82	1012	10
5	10	8	281	16	4.8	0.084	0.546	0.005	1209	56	-11	0.212	0.48	0.2	0.6	104	10	301.6	3	0	0	85	1012	10
5	10	8	281	17	0.1	0.105	0.15	0.005	1208	78	-1037.4	0.212	0.48	0.26	1	129	10	301	3	0	0	88	1012	10
5	10	8	281	18	-1.1	0.047	-9	-9	-999	24	8.6	0.212	0.48	0.55	0.9	112	10	300.1	3	0	0	82	1012	7
5	10	8	281	19	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	125	10	299.9	3	0	0	82	1012	7
5	10	8	281	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	85	10	299.5	3	0	0	88	1013	7
5	10	8	281	21	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	156	10	299.5	3	0	0	88	1014	7
5	10	8	281	22	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	140	10	299.5	3	0	0	94	1014	7
5	10	8	281	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	126	10	299.5	3	0	0	91	1013	7
5	10	8	281	24	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	156	10	299.4	3	0	0	94	1013	7
5	10	9	282	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	138	10	298.9	3	0	0	94	1012	7
5	10	9	282	2	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	140	10	298.6	3	0	0	97	1012	7
5	10	9	282	3	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	147	10	298.2	3	0	0	94	1012	7
5	10	9	282	4	-2.8	0.067	-9	-9	-999	40	9.7	0.687	0.8	1	0.9	141	10	298	3	0	0	94	1012	7
5	10	9	282	5	-3.2	0.067	-9	-9	-999	40	8.4	0.687	0.8	1	0.9	147	10	298.1	3	0	0	97	1012	0
5	10	9	282	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	126	10	298.4	3	0	0	94	1013	7
5	10	9	282	7	-1.7	0.092	-9	-9	-999	64	40.3	0.687	0.8	0.44	0.9	175	10	300.9	3	0	0	94	1013	0
5	10	9	282	8	71.8	0.243	0.883	0.005	346	276	-18.2	0.687	0.8	0.24	1.2	186	10	302.4	3	0	0	82	1014	6
5	10	9	282	9	134.2	0.289	1.369	0.005	692	358	-16.3	0.687	0.8	0.19	1.4	197	10	304	3	0	0	80	1014	6
5	10	9	282	10	143.4	0.291	1.533	0.005	910	362	-15.6	0.687	0.8	0.18	1.4	197	10	305.4	3	0	0	66	1014	8
5	10	9	282	11	118.7	0.297	1.489	0.005	1006	372	-19.9	0.674	0.73	0.17	1.5	244	10	305.9	3	0	0	60	1013	9
5	10	9	282	12	179.7	0.42	1.875	0.005	1327	625	-37.1	0.687	0.8	0.18	2.3	202	10	306.6	3	0	0	56	1012	8
5	10	9	282	13	157.4	0.376	1.887	0.005	1543	531	-30.3	0.687	0.8	0.18	2	186	10	306.9	3	0	0	66	1012	8
5	10	9	282	14	157.2	0.335	1.915	0.005	1614	447	-21.6	0.687	0.8	0.18	1.7	173	10	306.9	3	0	0	62	1011	8
5	10	9	282	15	74.6	0.298	1.514	0.005	1679	375	-32	0.687	0.8	0.19	1.6	159	10	305.9	3	0	0	50	1010	9
5	10	9	282	16	42.6	0.257	1.271	0.005	1736	300	-35.8	0.687	0.8	0.2	1.4	151	10	304.9	3	0	0	52	1010	10
5	10	9	282	17	3	0.176	0.525	0.005	1731	172	-163.3	0.687	0.8	0.27	1.1	155	10	303	3	0	0	59	1010	10
5	10	9	282	18	-2.3	0.075	-9	-9	-999	52	16.4	0.687	0.8	0.55	1	145	10	301.1	3	0	0	67	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	9	282	19	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	102	10	299.9	3	0	0	79	1012	7
5	10	9	282	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	98	10	299.4	3	0	0	82	1012	7
5	10	9	282	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	298.8	3	0	0	82	1013	7
5	10	9	282	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	82	10	298.6	3	0	0	88	1013	7
5	10	9	282	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.4	3	0	0	91	1013	7
5	10	9	282	24	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	91	10	298	3	0	0	94	1012	7
5	10	10	283	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	117	10	297.9	3	0	0	94	1012	7
5	10	10	283	2	-1	0.037	-9	-9	-999	17	4.7	0.687	0.8	1	0.5	140	10	297.6	3	0	0	97	1011	0
5	10	10	283	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	128	10	297.4	3	0	0	97	1011	3
5	10	10	283	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	107	10	297.4	3	0	0	97	1010	7
5	10	10	283	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	297.4	3	0	0	93	1011	7
5	10	10	283	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	98	10	297.9	3	0	0	97	1012	3
5	10	10	283	7	-0.5	0.042	-9	-9	-999	20	12.4	0.562	0.7	0.44	0.6	78	10	301.2	3	0	0	90	1013	0
5	10	10	283	8	62.9	0.187	0.978	0.006	537	185	-9.3	0.212	0.48	0.24	1.3	114	10	303.4	3	0	0	85	1013	0
5	10	10	283	9	89.3	0.233	1.13	0.005	584	259	-12.8	0.212	0.48	0.19	1.7	125	10	303.9	3	0	0	80	1014	7
5	10	10	283	10	95.8	0.225	1.189	0.005	634	245	-10.7	0.212	0.48	0.18	1.6	130	10	305.1	3	0	0	70	1013	8
5	10	10	283	11	103.6	0.211	1.255	0.005	689	223	-8.2	0.687	0.8	0.18	0.9	147	10	305.9	3	0	0	62	1013	9
5	10	10	283	12	35.7	0.12	0.887	0.005	707	98	-4.4	0.24	0.3	0.16	0.7	301	10	303.6	3	0	0	56	1012	10
5	10	10	283	13	61.6	0.129	1.081	0.005	740	106	-3.1	0.24	0.3	0.16	0.7	329	10	303.9	3	0	0.25	56	1010	9
5	10	10	283	14	112.2	0.268	1.538	0.005	1169	318	-15.4	0.562	0.7	0.18	1.4	349	10	304.4	3	0	0	68	1010	9
5	10	10	283	15	54.1	0.189	1.247	0.005	1292	191	-11.2	0.24	0.3	0.17	1.3	277	10	304.9	3	0	0	60	1009	9
5	10	10	283	16	48.3	0.155	1.212	0.005	1328	140	-6.9	0.562	0.7	0.2	0.7	335	10	304	3	0	0	58	1009	10
5	10	10	283	17	2.4	0.202	0.444	0.005	1326	209	-312.3	0.562	0.7	0.27	1.4	358	10	302.4	3	0	0	70	1010	10
5	10	10	283	18	-2.7	0.082	-9	-9	-999	63	18.4	0.687	0.8	0.56	1.1	196	10	302.4	3	0	0	85	1010	7
5	10	10	283	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	123	10	301.4	3	0	0	80	1011	7
5	10	10	283	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	112	10	300.4	3	0	0	82	1012	7
5	10	10	283	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	107	10	299.9	3	0	0	85	1012	7
5	10	10	283	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	96	10	299.4	3	0	0	88	1011	7
5	10	10	283	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	97	10	299.4	3	0	0	88	1011	7
5	10	10	283	24	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	142	10	298.9	3	0	0	88	1010	7
5	10	11	284	1	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	156	10	299.1	3	0	0	94	1010	7
5	10	11	284	2	-3.5	0.075	-9	-9	-999	47	10.8	0.687	0.8	1	1	153	10	299.4	3	0	0	94	1010	7
5	10	11	284	3	-1.7	0.052	-9	-9	-999	27	7.6	0.687	0.8	1	0.7	143	10	299.1	3	0	0	94	1010	7
5	10	11	284	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	122	10	299	3	0	0	94	1010	7
5	10	11	284	5	-2.6	0.06	-9	-9	-999	34	7.5	0.687	0.8	1	0.8	154	10	298.9	3	0	0	97	1011	0
5	10	11	284	6	-6.8	0.105	-9	-9	-999	78	15.2	0.687	0.8	1	1.4	168	10	300.4	3	0	0	100	1012	7
5	10	11	284	7	-2	0.121	-9	-9	-999	96	78.4	0.687	0.8	0.44	1	180	10	302	3	0	0	88	1012	0
5	10	11	284	8	44.4	0.176	0.677	0.005	252	170	-11.2	0.687	0.8	0.24	0.8	194	10	302.8	3	0	0	77	1013	9
5	10	11	284	9	49.6	-9	-9	-9	432	-999	-99999	0.475	0.6	0.19	0	0	10	303.9	3	0	0	75	1013	9
5	10	11	284	10	67.9	0.228	1.083	0.005	676	251	-15.8	0.562	0.7	0.18	1.2	346	10	303.4	3	0	0	66	1013	10
5	10	11	284	11	165.8	0.212	1.619	0.005	925	224	-5.2	0.562	0.7	0.18	0.9	11	10	305.4	3	0	0	58	1012	7
5	10	11	284	12	185.8	0.298	1.788	0.005	1112	375	-12.9	0.674	0.73	0.17	1.4	238	10	306.8	3	0	0	60	1011	7
5	10	11	284	13	54.4	-9	-9	-9	1162	-999	-99999	0.475	0.6	0.17	0	0	10	304.4	3	0	0	72	1010	10
5	10	11	284	14	16.6	0.199	0.815	0.005	1170	204	-42.4	0.562	0.7	0.18	1.2	70	10	299.6	3	0	0	85	1010	10
5	10	11	284	15	23.9	0.141	0.927	0.005	1196	122	-10.5	0.212	0.48	0.18	1	105	10	300.9	3	0	0	74	1009	10
5	10	11	284	16	17.1	0.187	0.833	0.005	1214	186	-34.2	0.562	0.7	0.2	1.1	81	10	301.4	3	0	0	65	1009	10
5	10	11	284	17	0.1	0.167	0.15	0.005	1213	157	-4214	0.562	0.7	0.27	1.2	85	10	300.8	3	0	0	74	1009	10
5	10	11	284	18	-2.3	0.069	-9	-9	-999	47	13.1	0.562	0.7	0.56	1	84	10	299.5	3	0	0	79	1010	7
5	10	11	284	19	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	84	10	299.1	3	0	0	82	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	11	284	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	89	10	299	3	0	0	85	1011	7
5	10	11	284	21	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	91	10	298.9	3	0	0	88	1011	0
5	10	11	284	22	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	88	10	298.5	3	0	0	94	1012	0
5	10	11	284	23	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	107	10	298.4	3	0	0	91	1011	7
5	10	11	284	24	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	129	10	298.5	3	0	0	94	1010	0
5	10	12	285	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	60	10	297.9	3	0	0	94	1010	7
5	10	12	285	2	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	34	10	297.2	3	0	0	94	1010	0
5	10	12	285	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	86	10	297.2	3	0	0	100	1010	3
5	10	12	285	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	122	10	297.1	3	0	0	100	1010	3
5	10	12	285	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	112	10	297.4	3	0	0	97	1011	3
5	10	12	285	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	116	10	299	3	0	0	94	1011	3
5	10	12	285	7	-0.6	0.042	-9	-9	-999	19	11.3	0.212	0.48	0.44	0.8	132	10	302.4	3	0	0	88	1012	0
5	10	12	285	8	84	0.232	1.303	0.006	952	256	-13.4	0.212	0.48	0.24	1.7	127	10	304.4	3	0	0	77	1012	0
5	10	12	285	9	120.4	0.221	1.5	0.006	1013	239	-8.1	0.212	0.48	0.19	1.5	130	10	305.9	3	0	0	70	1013	0
5	10	12	285	10	142.2	0.204	1.63	0.005	1101	213	-5.4	0.212	0.48	0.18	1.3	139	10	306.6	3	0	0	62	1012	3
5	10	12	285	11	173.7	0.255	1.812	0.005	1238	296	-8.6	0.687	0.8	0.18	1.1	146	10	307.1	3	0	0	58	1011	7
5	10	12	285	12	123.5	0.285	1.645	0.005	1300	350	-16.9	0.674	0.73	0.17	1.4	234	10	306.9	3	0	0	56	1010	9
5	10	12	285	13	56.8	0.25	1.279	0.005	1325	287	-24.6	0.674	0.73	0.17	1.3	220	10	303.8	3	0	9.14	52	1009	10
5	10	12	285	14	22.9	0.141	0.947	0.005	1334	127	-11.1	0.562	0.7	0.18	0.7	41	10	300.8	3	0	5.59	56	1008	10
5	10	12	285	15	13.4	0.158	0.793	0.005	1341	145	-26.6	0.562	0.7	0.18	0.9	41	10	300.8	3	0	0	74	1008	10
5	10	12	285	16	8.6	0.176	0.686	0.005	1344	171	-57.4	0.562	0.7	0.2	1.1	77	10	299.4	3	0	0	88	1008	10
5	10	12	285	17	0.4	0.107	0.25	0.005	1344	82	-266.5	0.212	0.48	0.27	1	90	10	299	3	0	0	85	1009	10
5	10	12	285	18	-1	0.042	-9	-9	-999	21	6.5	0.212	0.48	0.57	0.8	101	10	298.6	3	0	0	88	1009	7
5	10	12	285	19	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	88	10	298.8	3	0	0	88	1010	7
5	10	12	285	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	104	10	298.4	3	0	0	91	1010	7
5	10	12	285	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	105	10	298.5	3	0	0	82	1010	7
5	10	12	285	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	108	10	298.4	3	0	0	88	1010	7
5	10	12	285	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	75	10	298.4	3	0	0	94	1010	7
5	10	12	285	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	68	10	297.9	3	0	0	94	1009	7
5	10	13	286	1	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	69	10	297.9	3	0	0	100	1009	7
5	10	13	286	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	81	10	297.8	3	0	0	94	1009	0
5	10	13	286	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	60	10	297.5	3	0	0	100	1009	7
5	10	13	286	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	297.4	3	0	0	94	1009	7
5	10	13	286	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	297.4	3	0	0	94	1009	0
5	10	13	286	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	299.5	3	0	0	100	1010	7
5	10	13	286	7	-0.4	0.036	-9	-9	-999	16	9.9	0.212	0.48	0.44	0.7	129	10	302.5	3	0	0	88	1011	0
5	10	13	286	8	84	0.222	1.216	0.005	773	240	-11.7	0.212	0.48	0.24	1.6	128	10	304.4	3	0	0	82	1011	0
5	10	13	286	9	134.7	0.316	1.492	0.005	890	409	-21.2	0.687	0.8	0.19	1.6	140	10	305	3	0	0	70	1012	5
5	10	13	286	10	191	0.273	1.775	0.005	1058	329	-9.6	0.687	0.8	0.18	1.2	147	10	306.9	3	0	0	66	1011	5
5	10	13	286	11	130.6	0.247	1.619	0.005	1173	282	-10.3	0.687	0.8	0.18	1.1	149	10	306.6	3	0	0	66	1010	9
5	10	13	286	12	195.9	0.357	1.941	0.005	1346	490	-20.8	0.687	0.8	0.18	1.8	205	10	306.6	3	0	0	70	1009	7
5	10	13	286	13	62.1	0.117	1.341	0.005	1397	163	-2.3	0.24	0.3	0.16	0.6	286	10	305.2	3	0	6.6	56	1008	9
5	10	13	286	14	8.3	0.212	0.686	0.005	1395	225	-103.9	0.674	0.73	0.17	1.3	225	10	301.2	3	0	1.52	70	1008	10
5	10	13	286	15	6.8	0.161	0.643	0.005	1397	149	-55	0.562	0.7	0.18	1	18	10	299.1	3	0	0.76	80	1008	10
5	10	13	286	16	4	0.111	0.537	0.005	1402	85	-30.7	0.212	0.48	0.2	0.9	95	10	299.6	3	0	0	79	1007	10
5	10	13	286	17	0.1	0.099	0.158	0.005	1402	71	-863.9	0.562	0.7	0.27	0.7	64	10	299.8	3	0	0	75	1007	10
5	10	13	286	18	-1.6	0.056	-9	-9	-999	30	10	0.562	0.7	0.57	0.8	78	10	299.4	3	0	0	79	1008	7
5	10	13	286	19	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	299.4	3	0	0	85	1009	7
5	10	13	286	20	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	90	10	299.4	3	0	0	85	1009	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	13	286	21	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	92	10	298.9	3	0	0	86	1010	99
5	10	13	286	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	91	10	298.9	3	0	0	88	1010	3
5	10	13	286	23	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	91	10	298.8	3	0	0	88	1009	3
5	10	13	286	24	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	90	10	298.9	3	0	0	88	1009	3
5	10	14	287	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	298.2	3	0	0	94	1008	3
5	10	14	287	2	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	44	10	297.9	3	0	0	94	1008	0
5	10	14	287	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	56	10	297.9	3	0	0	88	1008	3
5	10	14	287	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	297.8	3	0	0	94	1008	3
5	10	14	287	5	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	110	10	298.1	3	0	0	94	1009	3
5	10	14	287	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	298	3	0	0	94	1010	3
5	10	14	287	7	-1.4	0.063	-9	-9	-999	36	16	0.562	0.7	0.44	0.9	84	10	299.4	3	0	0	94	1011	0
5	10	14	287	8	58.7	0.156	0.822	0.005	341	141	-5.8	0.212	0.48	0.24	1	111	10	303.4	3	0	0	75	1012	0
5	10	14	287	9	145.7	0.332	1.48	0.005	804	441	-22.7	0.687	0.8	0.2	1.7	141	10	304.5	3	0	0	75	1012	0
5	10	14	287	10	114	0.311	1.471	0.005	1008	399	-23.7	0.687	0.8	0.18	1.6	170	10	303.9	3	0	0	66	1012	9
5	10	14	287	11	89.3	0.11	1.422	0.006	1164	127	-1.3	0.24	0.3	0.16	0.5	289	10	302.9	3	0	0	68	1012	8
5	10	14	287	12	15.3	0.16	0.794	0.006	1174	148	-24.2	0.562	0.7	0.18	0.9	54	10	300.8	3	0	0	75	1011	10
5	10	14	287	13	5.2	0.195	0.554	0.005	1177	199	-129.5	0.562	0.7	0.18	1.3	70	10	299.4	3	0	0	82	1009	10
5	10	14	287	14	32.6	0.165	1.03	0.005	1205	155	-12.5	0.212	0.48	0.18	1.2	96	10	299.9	3	0	0	85	1009	10
5	10	14	287	15	49.5	0.163	1.198	0.005	1249	151	-7.8	0.212	0.48	0.18	1.1	101	10	301.8	3	0	0	88	1008	10
5	10	14	287	16	35.7	0.167	1.083	0.005	1280	156	-11.6	0.212	0.48	0.2	1.2	88	10	302.5	3	0	0	79	1008	10
5	10	14	287	17	2.5	0.135	0.449	0.005	1280	114	-87.7	0.212	0.48	0.27	1.2	93	10	300.9	3	0	0	82	1008	10
5	10	14	287	18	-1.9	0.057	-9	-9	-999	34	8.7	0.212	0.48	0.58	1.1	93	10	299.5	3	0	0	88	1008	7
5	10	14	287	19	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	93	10	298.9	3	0	0	94	1009	3
5	10	14	287	20	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	84	10	298.8	3	0	0	94	1009	7
5	10	14	287	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	98	10	298.4	3	0	0	94	1009	3
5	10	14	287	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	82	10	298.2	3	0	0	94	1009	3
5	10	14	287	23	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	79	10	297.9	3	0	0	94	1009	3
5	10	14	287	24	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	108	10	297.9	3	0	0	94	1009	3
5	10	15	288	1	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	95	10	297.8	3	0	0	94	1008	3
5	10	15	288	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	297.9	3	0	0	97	1007	3
5	10	15	288	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	298	3	0	0	94	1007	3
5	10	15	288	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	84	10	297.6	3	0	0	94	1008	3
5	10	15	288	5	-1.4	0.045	-9	-9	-999	22	5.8	0.687	0.8	1	0.6	146	10	297.6	3	0	0	97	1008	3
5	10	15	288	6	-1.9	0.052	-9	-9	-999	27	6.7	0.687	0.8	1	0.7	156	10	299.5	3	0	0	100	1009	3
5	10	15	288	7	-1.4	0.086	-9	-9	-999	58	39.4	0.212	0.48	0.44	1.1	135	10	302.4	3	0	0	94	1010	0
5	10	15	288	8	75.5	0.257	-9	-9	-999	300	-20.3	0.212	0.48	0.24	2	138	10	304	3	0	0	91	1010	0
5	10	15	288	9	88.2	0.252	-9	-9	-999	291	-16.3	0.212	0.48	0.19	1.9	137	10	304.9	3	0	0	80	1011	7
5	10	15	288	10	104.7	0.247	-9	-9	-999	282	-12.9	0.212	0.48	0.18	1.8	139	10	305.4	3	0	0	62	1010	8
5	10	15	288	11	218.1	0.415	-9	-9	-999	614	-29.5	0.687	0.8	0.18	2.2	145	10	306.8	3	0	0	60	1010	5
5	10	15	288	12	186.1	0.355	-9	-9	-999	488	-21.6	0.687	0.8	0.18	1.8	141	10	307.1	3	0	0	66	1009	7
5	10	15	288	13	124.4	0.354	-9	-9	-999	484	-32.1	0.687	0.8	0.18	1.9	142	10	306.4	3	0	0	56	1008	9
5	10	15	288	14	99.9	0.273	-9	-9	-999	332	-18.4	0.212	0.48	0.18	2.1	129	10	306.9	3	0	0	60	1007	8
5	10	15	288	15	113.8	0.351	-9	-9	-999	477	-34	0.687	0.8	0.19	1.9	145	10	307	3	0	0	56	1007	8
5	10	15	288	16	23.7	0.216	-9	-9	-999	241	-38.4	0.212	0.48	0.2	1.8	121	10	304.6	3	0	0	62	1007	10
5	10	15	288	17	0.6	0.148	-9	-9	-999	132	-490.5	0.212	0.48	0.27	1.4	117	10	302.5	3	0	0	70	1008	10
5	10	15	288	18	-1.9	0.057	-9	-9	-999	36	8.7	0.212	0.48	0.58	1.1	101	10	300.9	3	0	0	75	1008	7
5	10	15	288	19	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	84	10	300.1	3	0	0	79	1009	7
5	10	15	288	20	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	70	10	299.4	3	0	0	82	1010	0
5	10	15	288	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	102	10	298.9	3	0	0	82	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	15	288	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	112	10	298.8	3	0	0	82	1010	3
5	10	15	288	23	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	97	10	298.4	3	0	0	91	1010	0
5	10	15	288	24	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	93	10	298.5	3	0	0	94	1010	3
5	10	16	289	1	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	298.1	3	0	0	94	1009	3
5	10	16	289	2	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	66	10	297.4	3	0	0	94	1009	0
5	10	16	289	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	297.4	3	0	0	94	1009	3
5	10	16	289	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	297.4	3	0	0	94	1009	3
5	10	16	289	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	91	10	297.4	3	0	0	94	1010	3
5	10	16	289	6	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	89	10	299.1	3	0	0	94	1010	3
5	10	16	289	7	-0.8	0.047	-9	-9	-999	23	12.1	0.212	0.48	0.44	0.9	107	10	302.4	3	0	0	88	1011	0
5	10	16	289	8	74.1	0.209	1.069	0.008	595	220	-11.2	0.212	0.48	0.24	1.5	104	10	304.1	3	0	0	77	1012	0
5	10	16	289	9	123.1	0.241	1.334	0.007	697	271	-10.2	0.212	0.48	0.19	1.7	119	10	305.6	3	0	0	69	1012	0
5	10	16	289	10	137.9	0.243	1.423	0.006	754	276	-9.4	0.212	0.48	0.18	1.7	120	10	306.5	3	0	0	62	1012	5
5	10	16	289	11	152.2	0.256	1.517	0.005	829	298	-9.9	0.212	0.48	0.18	1.8	115	10	307.1	3	0	0	58	1011	6
5	10	16	289	12	149.7	0.236	1.555	0.005	906	264	-7.9	0.212	0.48	0.18	1.6	106	10	307.6	3	0	0	56	1009	7
5	10	16	289	13	100	0.18	1.4	0.005	990	176	-5.2	0.687	0.8	0.18	0.7	204	10	306.5	3	0	0	52	1009	9
5	10	16	289	14	16.2	0.316	0.765	0.005	994	409	-175.9	0.674	0.73	0.17	2	247	10	301.4	3	0	19.3	58	1008	10
5	10	16	289	15	62.8	0.13	1.233	0.005	1073	139	-3.2	0.562	0.7	0.18	0.5	16	10	301.4	3	0	1.02	56	1008	10
5	10	16	289	16	44.1	0.125	1.117	0.005	1136	101	-3.9	0.562	0.7	0.2	0.5	52	10	303.5	3	0	0	62	1008	10
5	10	16	289	17	2	0.111	0.396	0.005	1132	85	-63	0.562	0.7	0.27	0.7	52	10	301.8	3	0	0	66	1008	10
5	10	16	289	18	-2	0.056	-9	-9	-999	31	7.9	0.562	0.7	0.59	0.8	64	10	300.4	3	0	0	75	1009	3
5	10	16	289	19	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	70	10	300	3	0	0	79	1010	7
5	10	16	289	20	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	105	10	299.2	3	0	0	82	1012	7
5	10	16	289	21	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	124	10	298.4	3	0	0.76	88	1012	7
5	10	16	289	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	128	10	297.9	3	0	0.25	88	1012	7
5	10	16	289	23	-13.8	0.171	-9	-9	-999	162	32.6	0.212	0.48	1	2.3	138	10	297.9	3	0	0.25	88	1013	7
5	10	16	289	24	-3.4	0.067	-9	-9	-999	46	8.1	0.212	0.48	1	1.3	116	10	297.1	3	0	0.51	94	1012	7
5	10	17	290	1	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	296.4	3	0	3.81	94	1012	7
5	10	17	290	2	-2.1	0.063	-9	-9	-999	36	10.7	0.562	0.7	1	0.9	57	10	296.4	3	0	2.03	97	1010	10
5	10	17	290	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	296.4	3	0	0.25	100	1010	7
5	10	17	290	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	130	10	296.4	3	0	0.25	94	1010	7
5	10	17	290	5	-0.4	0.026	-9	-9	-999	10	3.8	0.212	0.48	1	0.5	104	10	296.5	3	0	0	100	1010	10
5	10	17	290	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	114	10	296.6	3	0	0	94	1010	7
5	10	17	290	7	-0.4	0.031	-9	-9	-999	13	6.3	0.212	0.48	0.45	0.6	125	10	297.9	3	0	0	94	1011	0
5	10	17	290	8	56.8	0.172	0.71	0.007	227	164	-8.1	0.562	0.7	0.24	0.8	82	10	300.2	3	0	0	91	1013	7
5	10	17	290	9	108.8	0.227	1.041	0.006	375	249	-9.7	0.687	0.8	0.2	1	162	10	302	3	0	0	75	1013	7
5	10	17	290	10	91.6	0.174	1.081	0.006	499	168	-5.2	0.212	0.48	0.18	1.1	121	10	302.9	3	0	0	70	1013	8
5	10	17	290	11	156.8	0.237	1.458	0.006	715	266	-7.7	0.212	0.48	0.18	1.6	113	10	304.8	3	0	0	65	1012	5
5	10	17	290	12	137.5	0.263	1.484	0.005	859	311	-12	0.212	0.48	0.18	1.9	108	10	304.5	3	0	0	70	1011	7
5	10	17	290	13	115.2	0.229	1.439	0.005	933	253	-9.4	0.212	0.48	0.18	1.6	110	10	304.5	3	0	0	61	1010	8
5	10	17	290	14	88.4	0.242	1.344	0.005	990	275	-14.5	0.212	0.48	0.18	1.8	114	10	304.8	3	0	0	65	1009	9
5	10	17	290	15	41.4	0.236	1.053	0.005	1014	263	-28.4	0.212	0.48	0.18	1.9	112	10	303.4	3	0	0	61	1009	10
5	10	17	290	16	19.7	0.204	0.825	0.005	1025	212	-38.8	0.212	0.48	0.2	1.7	111	10	302.5	3	0	0	70	1009	10
5	10	17	290	17	0	0.146	0.102	0.005	1023	128	-7449.3	0.212	0.48	0.28	1.4	111	10	301.4	3	0	0	80	1009	10
5	10	17	290	18	-1.7	0.052	-9	-9	-999	33	7.6	0.212	0.48	0.59	1	113	10	300.4	3	0	0	79	1009	7
5	10	17	290	19	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	116	10	299.8	3	0	0	82	1010	7
5	10	17	290	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	114	10	299.4	3	0	0	88	1011	7
5	10	17	290	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	114	10	298.9	3	0	0	82	1011	7
5	10	17	290	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	75	10	298.5	3	0	0	82	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	17	290	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.2	3	0	0	88	1010	7
5	10	17	290	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	298.4	3	0	0	88	1010	7
5	10	18	291	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	50	10	297.8	3	0	0	88	1009	7
5	10	18	291	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	50	10	297.4	3	0	0	94	1009	7
5	10	18	291	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	57	10	297.2	3	0	0	94	1010	7
5	10	18	291	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	297.5	3	0	0	94	1010	7
5	10	18	291	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	76	10	297.6	3	0	0	97	1010	7
5	10	18	291	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	94	10	298	3	0	0	94	1012	7
5	10	18	291	7	-1	0.052	-9	-9	-999	27	12.1	0.212	0.48	0.45	1	100	10	301.4	3	0	0	94	1012	0
5	10	18	291	8	66.8	0.198	1.037	0.005	603	202	-10.4	0.212	0.48	0.24	1.4	95	10	303.4	3	0	0	82	1013	0
5	10	18	291	9	116.9	0.287	1.447	0.005	938	353	-18.2	0.212	0.48	0.19	2.2	120	10	305	3	0	0	75	1013	0
5	10	18	291	10	129.9	0.299	1.599	0.005	1138	376	-18.6	0.212	0.48	0.18	2.3	115	10	305.4	3	0	0	66	1013	6
5	10	18	291	11	132.1	0.291	1.649	0.005	1227	360	-16.7	0.212	0.48	0.18	2.2	111	10	305.9	3	0	0	66	1012	7
5	10	18	291	12	154.9	0.295	1.787	0.006	1331	369	-14.9	0.212	0.48	0.18	2.2	115	10	306.4	3	0	0	58	1010	6
5	10	18	291	13	131.1	0.281	1.728	0.006	1419	343	-15.2	0.212	0.48	0.18	2.1	116	10	306.4	3	0	0	60	1010	8
5	10	18	291	14	119	0.297	1.704	0.006	1499	372	-19.8	0.212	0.48	0.18	2.3	121	10	306.4	3	0	0	63	1009	8
5	10	18	291	15	73.5	0.276	1.467	0.006	1546	333	-25.6	0.212	0.48	0.18	2.2	121	10	305.5	3	0	0	58	1009	9
5	10	18	291	16	36.5	0.252	1.164	0.006	1558	291	-39.4	0.212	0.48	0.2	2.1	120	10	304.4	3	0	0	61	1009	9
5	10	18	291	17	0.1	0.146	0.163	0.006	1555	132	-2790.9	0.212	0.48	0.28	1.4	115	10	301.9	3	0	0	70	1009	10
5	10	18	291	18	-2.4	0.057	-9	-9	-999	36	6.9	0.212	0.48	0.6	1.1	103	10	300.8	3	0	0	79	1010	3
5	10	18	291	19	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	105	10	300	3	0	0	82	1010	3
5	10	18	291	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	104	10	299.5	3	0	0	88	1011	3
5	10	18	291	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	108	10	299.1	3	0	0	82	1012	3
5	10	18	291	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	101	10	299	3	0	0	88	1012	3
5	10	18	291	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	99	10	298.9	3	0	0	88	1012	3
5	10	18	291	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	108	10	298.5	3	0	0	94	1011	3
5	10	19	292	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	298.1	3	0	0	88	1010	3
5	10	19	292	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	297.9	3	0	0	94	1010	3
5	10	19	292	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	68	10	297.4	3	0	0	94	1010	3
5	10	19	292	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	296.9	3	0	0	94	1010	3
5	10	19	292	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	65	10	296.8	3	0	0	97	1011	0
5	10	19	292	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	96	10	298.8	3	0	0	97	1012	3
5	10	19	292	7	-0.6	0.042	-9	-9	-999	20	11.6	0.562	0.7	0.45	0.6	67	10	302	3	0	0	94	1013	0
5	10	19	292	8	75.4	0.15	1.03	0.006	524	134	-4	0.212	0.48	0.24	0.9	98	10	304.2	3	0	0	77	1013	0
5	10	19	292	9	115.6	0.179	1.344	0.008	760	175	-4.5	0.212	0.48	0.19	1.1	106	10	305.4	3	0	0	70	1014	0
5	10	19	292	10	157.1	0.141	1.55	0.008	857	122	-1.6	0.212	0.48	0.18	0.7	125	10	307.1	3	0	0	58	1013	0
5	10	19	292	11	146.2	0.114	1.563	0.007	944	89	-1	0.212	0.48	0.18	0.5	91	10	307.1	3	0	0	58	1013	6
5	10	19	292	12	131.8	0.297	1.55	0.006	1021	373	-18	0.562	0.7	0.18	1.6	348	10	305.1	3	0	0	56	1012	9
5	10	19	292	13	76.2	0.269	1.311	0.005	1065	322	-23.1	0.562	0.7	0.18	1.5	346	10	304.2	3	0	0	51	1010	10
5	10	19	292	14	55.1	0.298	1.188	0.005	1097	373	-43	0.562	0.7	0.18	1.8	352	10	303.9	3	0	0	56	1010	10
5	10	19	292	15	30	0.222	0.975	0.005	1114	242	-32.8	0.562	0.7	0.18	1.3	360	10	303.4	3	0	0	54	1010	10
5	10	19	292	16	22.2	0.114	0.886	0.005	1128	94	-6	0.562	0.7	0.2	0.5	44	10	303.9	3	0	0	58	1010	10
5	10	19	292	17	0.1	0.125	0.146	0.005	1126	102	-1769.4	0.212	0.48	0.28	1.2	108	10	302.1	3	0	0	63	1010	10
5	10	19	292	18	-2	0.052	-9	-9	-999	29	6.2	0.212	0.48	0.6	1	95	10	300.9	3	0	0	74	1010	3
5	10	19	292	19	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	104	10	299.9	3	0	0	79	1011	3
5	10	19	292	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	84	10	299.5	3	0	0	82	1011	3
5	10	19	292	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	86	10	299	3	0	0	77	1012	3
5	10	19	292	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	103	10	298.6	3	0	0	88	1012	3
5	10	19	292	23	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	100	10	298.4	3	0	0	88	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	19	292	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	93	10	298	3	0	0	88	1010	3
5	10	20	293	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	298	3	0	0	94	1010	3
5	10	20	293	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	106	10	297.9	3	0	0	94	1010	0
5	10	20	293	3	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	110	10	297.9	3	0	0	94	1010	3
5	10	20	293	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	298	3	0	0	100	1010	3
5	10	20	293	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	297.5	3	0	0	94	1010	3
5	10	20	293	6	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	84	10	299.2	3	0	0	94	1011	7
5	10	20	293	7	-1.4	0.063	-9	-9	-999	36	15.4	0.562	0.7	0.45	0.9	82	10	300.1	3	0	0	82	1012	0
5	10	20	293	8	67.8	0.188	0.935	0.005	435	188	-8.9	0.212	0.48	0.24	1.3	107	10	302.8	3	0	0	79	1013	0
5	10	20	293	9	89.4	0.194	1.285	0.006	858	197	-7.4	0.212	0.48	0.19	1.3	104	10	304.4	3	0	0	80	1013	7
5	10	20	293	10	138.6	0.204	1.536	0.006	946	212	-5.5	0.212	0.48	0.18	1.3	128	10	305.9	3	0	0	66	1012	0
5	10	20	293	11	117.1	0.21	1.49	0.005	1020	222	-7.2	0.212	0.48	0.18	1.4	93	10	305.4	3	0	0	70	1011	8
5	10	20	293	12	115.2	0.284	1.516	0.005	1092	349	-18	0.687	0.8	0.18	1.4	145	10	305	3	0	0	85	1010	9
5	10	20	293	13	0.1	0.085	0.145	0.005	1085	108	-557.9	0.562	0.7	0.18	0.6	357	10	298.5	3	0	36.07	75	1011	10
5	10	20	293	14	0.1	0.125	0.145	0.005	1083	102	-1770.6	0.212	0.48	0.18	1.2	115	10	296.5	3	0	18.29	82	1010	10
5	10	20	293	15	21.2	0.168	0.865	0.005	1098	158	-20	0.212	0.48	0.18	1.3	110	10	297.9	3	0	0	94	1008	10
5	10	20	293	16	40.3	0.203	1.08	0.005	1126	211	-18.7	0.562	0.7	0.2	1.1	63	10	300.1	3	0	0	94	1008	10
5	10	20	293	17	0.2	0.126	0.17	0.005	1123	105	-1155.7	0.562	0.7	0.28	0.9	58	10	298.4	3	0	0	88	1009	10
5	10	20	293	18	-1.8	0.052	-9	-9	-999	29	7.1	0.212	0.48	0.61	1	96	10	297.9	3	0	0	88	1009	7
5	10	20	293	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	297.9	3	0	0	94	1010	7
5	10	20	293	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	96	10	297.9	3	0	0	97	1010	0
5	10	20	293	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	106	10	297.8	3	0	0	94	1010	3
5	10	20	293	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	108	10	298	3	0	0	94	1010	3
5	10	20	293	23	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	108	10	298.2	3	0	0	100	1010	3
5	10	20	293	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	54	10	297.9	3	0	0	100	1010	3
5	10	21	294	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	33	10	297.2	3	0	0	100	1009	3
5	10	21	294	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	46	10	297	3	0	0	97	1009	3
5	10	21	294	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	297.1	3	0	0	94	1009	3
5	10	21	294	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	129	10	297.1	3	0	0	82	1009	7
5	10	21	294	5	-0.9	0.037	-9	-9	-999	17	5.4	0.687	0.8	1	0.5	151	10	297.1	3	0	0	97	1009	7
5	10	21	294	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	94	1010	7
5	10	21	294	7	-1.6	0.067	-9	-9	-999	40	17.3	0.687	0.8	0.45	0.9	163	10	300.9	3	0	0	88	1011	0
5	10	21	294	8	56.4	0.251	0.667	0.005	189	289	-25.2	0.687	0.8	0.24	1.3	188	10	301.8	3	0	0	85	1012	8
5	10	21	294	9	109.7	0.376	1.194	0.005	560	530	-43.6	0.687	0.8	0.2	2.1	182	10	303.5	3	0	0	80	1012	7
5	10	21	294	10	84.2	0.381	1.243	0.005	823	541	-59.3	0.687	0.8	0.18	2.2	142	10	301.9	3	0	0.25	82	1012	9
5	10	21	294	11	80.8	0.24	1.28	0.005	938	282	-15.5	0.212	0.48	0.18	1.8	134	10	301.2	3	0	0	91	1011	9
5	10	21	294	12	111.5	0.35	1.503	0.005	1099	476	-34.6	0.687	0.8	0.18	1.9	142	10	302.4	3	0	0	82	1010	9
5	10	21	294	13	146.7	0.333	1.753	0.005	1323	442	-22.6	0.687	0.8	0.18	1.7	164	10	303.4	3	0	0	75	1009	8
5	10	21	294	14	55.9	0.356	1.295	0.005	1400	489	-72.8	0.687	0.8	0.18	2.1	143	10	301.9	3	0	1.27	70	1009	10
5	10	21	294	15	15.9	0.161	0.854	0.005	1405	180	-23.6	0.562	0.7	0.18	0.9	77	10	298.5	3	0	0.25	82	1009	10
5	10	21	294	16	3.6	0.11	0.519	0.005	1407	85	-33.3	0.212	0.48	0.2	0.9	94	10	298.8	3	0	0	94	1009	10
5	10	21	294	17	0.1	0.136	0.158	0.005	1407	115	-2241.8	0.212	0.48	0.28	1.3	96	10	298.5	3	0	0	94	1010	7
5	10	21	294	18	-3.5	0.073	-9	-9	-999	46	9.9	0.212	0.48	0.61	1.4	102	10	298.4	3	0	0	94	1010	7
5	10	21	294	19	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	101	10	298.4	3	0	0	94	1010	7
5	10	21	294	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	108	10	298.4	3	0	0	97	1012	7
5	10	21	294	21	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	90	10	298.2	3	0	0	94	1012	7
5	10	21	294	22	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	72	10	297.9	3	0	0	94	1012	7
5	10	21	294	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	75	10	297.9	3	0	0	91	1012	7
5	10	21	294	24	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	90	10	297.9	3	0	0	88	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	22	295	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	102	10	297.9	3	0	0	88	1010	7
5	10	22	295	2	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	113	10	298.1	3	0	0	94	1009	7
5	10	22	295	3	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	115	10	298.1	3	0	0	94	1009	7
5	10	22	295	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	111	10	298.2	3	0	0	94	1009	7
5	10	22	295	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	92	10	298.4	3	0	0	94	1009	7
5	10	22	295	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.9	3	0	0	88	1010	7
5	10	22	295	7	-1.1	0.052	-9	-9	-999	27	11.6	0.212	0.48	0.45	1	112	10	301.9	3	0	0	94	1011	0
5	10	22	295	8	57	0.232	0.613	0.005	145	257	-19.8	0.212	0.48	0.24	1.8	134	10	303.5	3	0	0	88	1012	0
5	10	22	295	9	89.2	0.252	0.973	0.005	373	291	-16.2	0.212	0.48	0.19	1.9	129	10	304.2	3	0	0	85	1012	6
5	10	22	295	10	122.3	0.26	1.326	0.005	688	305	-13	0.212	0.48	0.18	1.9	126	10	305.2	3	0	0	75	1012	6
5	10	22	295	11	97.3	0.254	1.361	0.006	936	295	-15.2	0.212	0.48	0.18	1.9	131	10	304.6	3	0	0.51	66	1011	9
5	10	22	295	12	100.4	0.283	1.407	0.006	999	346	-20.3	0.212	0.48	0.18	2.2	133	10	304.8	3	0	0	62	1010	9
5	10	22	295	13	43.3	0.236	1.073	0.006	1026	265	-27.5	0.212	0.48	0.18	1.9	125	10	303.8	3	0	0	70	1009	10
5	10	22	295	14	89.7	0.261	1.392	0.006	1083	307	-17.9	0.212	0.48	0.18	2	128	10	304.4	3	0	0	64	1008	9
5	10	22	295	15	69.8	0.275	1.298	0.006	1127	331	-26.7	0.212	0.48	0.18	2.2	129	10	304.2	3	0	0	62	1009	9
5	10	22	295	16	34	0.223	1.027	0.006	1145	242	-29.2	0.212	0.48	0.2	1.8	123	10	302.2	3	0	0	74	1009	10
5	10	22	295	17	1.2	0.121	0.336	0.006	1144	101	-134.3	0.212	0.48	0.28	1.1	109	10	301	3	0	0	85	1009	10
5	10	22	295	18	-1.4	0.047	-9	-9	-999	26	6.4	0.212	0.48	0.62	0.9	108	10	300	3	0	0	88	1009	7
5	10	22	295	19	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	102	10	299.6	3	0	0	88	1010	7
5	10	22	295	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	100	10	299.4	3	0	0	94	1010	7
5	10	22	295	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	104	10	299	3	0	0	88	1011	7
5	10	22	295	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	298.9	3	0	0	94	1011	7
5	10	22	295	23	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	106	10	299	3	0	0	94	1011	7
5	10	22	295	24	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	102	10	298.6	3	0	0	94	1010	7
5	10	23	296	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	98	10	298.2	3	0	0	94	1009	7
5	10	23	296	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	89	10	298.1	3	0	0	94	1009	7
5	10	23	296	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	48	10	297.8	3	0	0	94	1009	7
5	10	23	296	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	46	10	297.1	3	0	0	94	1009	7
5	10	23	296	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	69	10	297.2	3	0	0	97	1010	7
5	10	23	296	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.6	3	0	0	94	1011	7
5	10	23	296	7	-1.4	0.057	-9	-9	-999	31	12.4	0.212	0.48	0.45	1.1	97	10	301.8	3	0	0	88	1012	0
5	10	23	296	8	82	0.269	-9	-9	-999	320	-21.3	0.212	0.48	0.24	2.1	120	10	304.1	3	0	0	85	1012	0
5	10	23	296	9	95.3	0.263	-9	-9	-999	310	-17.2	0.212	0.48	0.19	2	115	10	304.9	3	0	0	75	1013	5
5	10	23	296	10	39.8	0.225	-9	-9	-999	246	-25.9	0.212	0.48	0.18	1.8	108	10	303.1	3	0	0	80	1013	10
5	10	23	296	11	80.5	0.259	-9	-9	-999	303	-19.4	0.212	0.48	0.18	2	117	10	303.8	3	0	0	75	1012	9
5	10	23	296	12	65.9	0.245	-9	-9	-999	279	-20.1	0.212	0.48	0.18	1.9	118	10	304.2	3	0	0	75	1011	10
5	10	23	296	13	79.3	0.277	-9	-9	-999	336	-24.2	0.212	0.48	0.18	2.2	116	10	304.4	3	0	0	66	1011	9
5	10	23	296	14	44.2	0.208	-9	-9	-999	220	-18.4	0.212	0.48	0.18	1.6	124	10	302.5	3	0	0	75	1010	10
5	10	23	296	15	15.2	0.153	-9	-9	-999	139	-21.4	0.212	0.48	0.18	1.2	106	10	301.4	3	0	0	85	1010	10
5	10	23	296	16	4.3	0.168	-9	-9	-999	158	-99	0.212	0.48	0.2	1.5	116	10	300.5	3	0	0	91	1010	10
5	10	23	296	17	0.1	0.146	-9	-9	-999	128	-2794.6	0.212	0.48	0.28	1.4	109	10	298.9	3	0	0	91	1010	10
5	10	23	296	18	-2.2	0.057	-9	-9	-999	35	7.7	0.212	0.48	0.62	1.1	104	10	299.1	3	0	0	94	1010	7
5	10	23	296	19	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	90	10	299.1	3	0	0	94	1011	7
5	10	23	296	20	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	77	10	298.9	3	0	0	94	1012	0
5	10	23	296	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	89	10	298.9	3	0	0	88	1012	7
5	10	23	296	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	77	10	298.8	3	0	0	94	1012	7
5	10	23	296	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	298.2	3	0	0	94	1012	7
5	10	23	296	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	79	10	297.9	3	0	0	88	1011	7
5	10	24	297	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	64	10	298	3	0	0	88	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	24	297	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	297.5	3	0	0	97	1010	3
5	10	24	297	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	297.6	3	0	0	94	1010	3
5	10	24	297	4	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	72	10	297.8	3	0	0	88	1010	0
5	10	24	297	5	-3.9	0.067	-9	-9	-999	40	7.1	0.212	0.48	1	1.3	92	10	298	3	0	0.51	88	1011	0
5	10	24	297	6	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	80	10	297.9	3	0	0.76	94	1012	7
5	10	24	297	7	-2.4	0.079	-9	-9	-999	51	18.3	0.212	0.48	0.45	1.3	97	10	299.8	3	0	0	94	1013	0
5	10	24	297	8	21.2	0.168	0.411	0.009	118	158	-20	0.212	0.48	0.24	1.3	136	10	299.6	3	0	0	88	1013	9
5	10	24	297	9	42.4	0.16	0.582	0.009	168	147	-8.7	0.212	0.48	0.19	1.1	118	10	300.8	3	0	0	82	1014	9
5	10	24	297	10	52.7	0.143	0.696	0.007	231	125	-5.1	0.212	0.48	0.18	0.9	97	10	302.1	3	0	0	82	1013	9
5	10	24	297	11	35.4	0.188	0.644	0.007	272	187	-16.9	0.562	0.7	0.18	1	70	10	299.4	3	0	3.05	82	1013	10
5	10	24	297	12	35.4	0.162	0.676	0.006	314	150	-10.8	0.562	0.7	0.18	0.8	72	10	299.2	3	0	0	94	1011	10
5	10	24	297	13	82.2	0.165	0.982	0.005	415	155	-5	0.562	0.7	0.18	0.7	74	10	301.6	3	0	0	79	1010	10
5	10	24	297	14	51.6	0.122	0.882	0.005	478	98	-3.2	0.212	0.48	0.18	0.7	94	10	302.6	3	0	0	85	1010	10
5	10	24	297	15	45.4	0.19	0.876	0.005	533	191	-13.6	0.212	0.48	0.18	1.4	107	10	302.6	3	0	0	80	1009	10
5	10	24	297	16	18	0.156	0.651	0.005	553	141	-18.9	0.212	0.48	0.2	1.2	95	10	302	3	0	0	75	1009	10
5	10	24	297	17	0.1	0.095	0.115	0.005	551	68	-762.3	0.212	0.48	0.28	0.9	120	10	300.9	3	0	0	85	1010	10
5	10	24	297	18	-2.6	0.062	-9	-9	-999	36	8.3	0.212	0.48	0.62	1.2	113	10	299.2	3	0	2.29	85	1010	7
5	10	24	297	19	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	82	10	298.4	3	0	0	88	1011	7
5	10	24	297	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	298.2	3	0	0	91	1011	7
5	10	24	297	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	80	10	298.1	3	0	0	88	1011	7
5	10	24	297	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	297.8	3	0	0	88	1011	7
5	10	24	297	23	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	77	10	297.6	3	0	0	94	1011	0
5	10	24	297	24	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	123	10	297.9	3	0	0	94	1011	7
5	10	25	298	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	298.1	3	0	0	77	1010	7
5	10	25	298	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	99	10	297.6	3	0	0.25	88	1010	0
5	10	25	298	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	46	10	297.5	3	0	0	94	1010	7
5	10	25	298	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	52	10	297.1	3	0	0	100	1010	3
5	10	25	298	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	107	10	297.4	3	0	0.25	97	1011	7
5	10	25	298	6	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	171	10	297.5	3	0	0	94	1012	7
5	10	25	298	7	-0.5	0.035	-9	-9	-999	15	7.6	0.562	0.7	0.45	0.5	65	10	299.4	3	0	0	88	1012	0
5	10	25	298	8	23.5	0.15	0.444	0.005	134	134	-13	0.687	0.8	0.25	0.7	168	10	299.4	3	0	0	85	1013	10
5	10	25	298	9	15.4	0.144	0.413	0.005	164	126	-17.6	0.212	0.48	0.19	1.1	135	10	298.9	3	0	2.03	88	1014	10
5	10	25	298	10	61.4	0.173	0.785	0.005	284	166	-7.6	0.562	0.7	0.18	0.8	65	10	298.8	3	0	0	82	1014	10
5	10	25	298	11	106.5	0.198	1.329	0.005	796	203	-6.6	0.212	0.48	0.18	1.3	103	10	302.2	3	0	0	94	1012	8
5	10	25	298	12	101.3	0.197	1.382	0.005	941	201	-6.8	0.212	0.48	0.18	1.3	110	10	303.4	3	0	0	94	1011	9
5	10	25	298	13	83.5	0.152	1.323	0.005	1001	136	-3.8	0.212	0.48	0.18	0.9	102	10	303.8	3	0	0	75	1010	9
5	10	25	298	14	52.6	0.247	1.149	0.005	1038	283	-25.8	0.562	0.7	0.18	1.4	76	10	303	3	0	0	88	1009	10
5	10	25	298	15	10.4	0.28	0.67	0.005	1040	340	-189.6	0.562	0.7	0.18	1.9	79	10	298.8	3	0	6.86	94	1010	10
5	10	25	298	16	0.1	0.115	0.143	0.005	1039	112	-1370.3	0.212	0.48	0.2	1.1	117	10	297.4	3	0	1.02	100	1010	10
5	10	25	298	17	0.1	0.095	0.143	0.005	1038	67	-763	0.212	0.48	0.29	0.9	105	10	297.1	3	0	0	94	1011	7
5	10	25	298	18	-1.8	0.056	-9	-9	-999	30	8.4	0.562	0.7	0.63	0.8	73	10	297.5	3	0	0	94	1011	7
5	10	25	298	19	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	72	10	297.5	3	0	0	94	1012	7
5	10	25	298	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	297.4	3	0	0	97	1013	7
5	10	25	298	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	98	10	297.1	3	0	0	100	1013	7
5	10	25	298	22	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	86	10	297.5	3	0	0	100	1013	7
5	10	25	298	23	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	83	10	297.6	3	0	0	94	1012	7
5	10	25	298	24	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	95	10	297.5	3	0	0	88	1011	7
5	10	26	299	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	61	10	297.1	3	0	0	94	1010	3
5	10	26	299	2	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	94	10	296.9	3	0	0	97	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	26	299	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	98	10	297	3	0	0	94	1010	3
5	10	26	299	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	51	10	296.9	3	0	0	94	1010	7
5	10	26	299	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.9	3	0	0	97	1011	0
5	10	26	299	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.4	3	0	0	100	1012	7
5	10	26	299	7	-0.7	0.042	-9	-9	-999	20	9	0.562	0.7	0.46	0.6	78	10	299.4	3	0	0	100	1012	0
5	10	26	299	8	99.8	0.17	0.95	0.005	310	161	-4.4	0.562	0.7	0.24	0.7	82	10	302.9	3	0	0	88	1013	0
5	10	26	299	9	94.8	0.215	1.078	0.006	477	229	-9.4	0.212	0.48	0.19	1.5	107	10	304.1	3	0	0	80	1013	5
5	10	26	299	10	129.4	0.242	1.362	0.006	705	273	-9.9	0.212	0.48	0.18	1.7	99	10	304.9	3	0	0	75	1013	5
5	10	26	299	11	153	0.246	1.534	0.006	853	281	-8.8	0.212	0.48	0.18	1.7	96	10	306.1	3	0	0	68	1012	5
5	10	26	299	12	103.8	0.265	1.38	0.006	914	314	-16.2	0.212	0.48	0.18	2	96	10	305.4	3	0	0	62	1011	9
5	10	26	299	13	116.9	0.259	1.472	0.006	983	303	-13.4	0.212	0.48	0.18	1.9	106	10	305	3	0	0	62	1010	8
5	10	26	299	14	115.7	0.259	1.501	0.006	1053	303	-13.5	0.212	0.48	0.18	1.9	106	10	305.9	3	0	0	60	1009	8
5	10	26	299	15	43.4	0.208	1.091	0.006	1077	219	-18.7	0.212	0.48	0.19	1.6	109	10	304.6	3	0	0	58	1009	10
5	10	26	299	16	6.6	0.144	0.583	0.006	1077	126	-40.2	0.212	0.48	0.21	1.2	115	10	302.5	3	0	0	65	1009	10
5	10	26	299	17	0.1	0.105	0.144	0.006	1075	78	-1035.4	0.212	0.48	0.29	1	106	10	301.6	3	0	0	72	1009	10
5	10	26	299	18	-1.2	0.042	-9	-9	-999	21	5.5	0.212	0.48	0.63	0.8	109	10	300.4	3	0	0	79	1010	7
5	10	26	299	19	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	299.9	3	0	0	82	1011	7
5	10	26	299	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	299.5	3	0	0	88	1012	7
5	10	26	299	21	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	106	10	299	3	0	0	90	1012	0
5	10	26	299	22	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	78	10	298.9	3	0	0	92	1012	0
5	10	26	299	23	-0.9	0.042	-9	-9	-999	20	7.1	0.562	0.7	1	0.6	78	10	298.5	3	0	0	94	1011	10
5	10	26	299	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	101	10	298.4	3	0	0	95	1010	0
5	10	27	300	1	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	104	10	298	3	0	0	96	1009	0
5	10	27	300	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	298	3	0	0	97	1009	7
5	10	27	300	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	298.1	3	0	0	100	1009	7
5	10	27	300	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	109	10	297.9	3	0	0	94	1009	7
5	10	27	300	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	297.5	3	0	0	97	1010	7
5	10	27	300	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	126	10	298.2	3	0	0	94	1010	7
5	10	27	300	7	-1	0.047	-9	-9	-999	23	9	0.212	0.48	0.46	0.9	118	10	300.9	3	0	0	94	1011	0
5	10	27	300	8	35.8	0.127	0.587	0.005	204	104	-5.2	0.212	0.48	0.25	0.8	88	10	302.1	3	0	0	85	1012	8
5	10	27	300	9	38.9	0.138	0.665	0.005	272	118	-6.2	0.212	0.48	0.2	0.9	109	10	302.5	3	0	0	79	1013	10
5	10	27	300	10	53.2	0.164	0.814	0.005	366	153	-7.5	0.212	0.48	0.18	1.1	118	10	303.1	3	0	0	85	1012	10
5	10	27	300	11	112.1	0.311	1.216	0.005	579	398	-24.1	0.687	0.8	0.18	1.6	143	10	303.5	3	0	0	75	1012	9
5	10	27	300	12	67.3	0.282	1.144	0.005	802	345	-30	0.687	0.8	0.18	1.5	140	10	303.4	3	0	0	80	1010	10
5	10	27	300	13	38.4	0.168	0.963	0.005	838	164	-11.1	0.212	0.48	0.18	1.2	128	10	302.9	3	0	0	88	1010	10
5	10	27	300	14	41.5	0.189	1.004	0.005	877	188	-14.5	0.212	0.48	0.18	1.4	129	10	303.2	3	0	0	82	1009	10
5	10	27	300	15	46.3	0.259	1.058	0.005	920	303	-33.7	0.687	0.8	0.19	1.4	143	10	303.1	3	0	0	70	1009	10
5	10	27	300	16	21.2	0.177	0.822	0.005	940	173	-23.5	0.212	0.48	0.21	1.4	129	10	302.9	3	0	0	75	1009	10
5	10	27	300	17	0.1	0.156	0.138	0.005	938	142	-3425.1	0.212	0.48	0.29	1.5	122	10	301.4	3	0	0	77	1009	10
5	10	27	300	18	-2.6	0.062	-9	-9	-999	40	8.2	0.212	0.48	0.64	1.2	113	10	300.4	3	0	0	85	1009	7
5	10	27	300	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	105	10	299.9	3	0	0	88	1010	7
5	10	27	300	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	51	10	299.8	3	0	0	88	1011	7
5	10	27	300	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	34	10	299	3	0	0	82	1012	7
5	10	27	300	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	74	10	298.9	3	0	0	94	1011	7
5	10	27	300	23	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	50	10	298.4	3	0	0	97	1011	7
5	10	27	300	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	34	10	298.1	3	0	0	94	1010	7
5	10	28	301	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	28	10	297.8	3	0	0	94	1010	7
5	10	28	301	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	55	10	297.5	3	0	0	100	1009	7
5	10	28	301	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	297.8	3	0	0	100	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	28	301	4	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	85	10	297.9	3	0	0	94	1009	3
5	10	28	301	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	45	10	297.4	3	0	0	94	1010	7
5	10	28	301	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	60	10	298.6	3	0	0	100	1010	7
5	10	28	301	7	-0.8	0.042	-9	-9	-999	19	8	0.212	0.48	0.46	0.8	86	10	301.5	3	0	0	94	1011	0
5	10	28	301	8	53.6	0.212	0.762	0.005	298	225	-16.1	0.212	0.48	0.25	1.6	106	10	302.6	3	0	0	85	1012	0
5	10	28	301	9	86.1	0.26	1.159	0.005	654	305	-18.5	0.212	0.48	0.2	2	113	10	304	3	0	0	80	1012	7
5	10	28	301	10	122	0.316	1.44	0.005	884	409	-23.4	0.212	0.48	0.18	2.5	113	10	304.8	3	0	0	75	1012	6
5	10	28	301	11	140.8	0.32	1.595	0.005	1040	417	-21	0.212	0.48	0.18	2.5	110	10	305.6	3	0	0	66	1011	6
5	10	28	301	12	138.2	0.31	1.66	0.005	1194	398	-19.5	0.212	0.48	0.18	2.4	108	10	305.9	3	0	0	75	1010	7
5	10	28	301	13	137.9	0.31	1.727	0.005	1346	398	-19.5	0.212	0.48	0.18	2.4	116	10	305.4	3	0	0	66	1009	7
5	10	28	301	14	118.1	0.306	1.691	0.005	1475	390	-21.8	0.212	0.48	0.18	2.4	99	10	304.9	3	0	0	72	1009	7
5	10	28	301	15	75.6	0.276	1.477	0.005	1536	334	-25.1	0.212	0.48	0.19	2.2	113	10	304.4	3	0	0	79	1009	8
5	10	28	301	16	1.6	0.228	0.408	0.005	1530	252	-670.8	0.687	0.8	0.21	1.5	143	10	300	3	0	1.27	75	1009	10
5	10	28	301	17	0.1	0.146	0.162	0.005	1529	130	-2793.7	0.212	0.48	0.29	1.4	132	10	299.9	3	0	0	80	1010	0
5	10	28	301	18	-3.7	0.073	-9	-9	-999	47	9.4	0.212	0.48	0.64	1.4	98	10	298.8	3	0	0	82	1010	7
5	10	28	301	19	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	103	10	298.2	3	0	0	88	1010	7
5	10	28	301	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	92	10	298.2	3	0	0	94	1011	7
5	10	28	301	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	97	10	298.6	3	0	0	94	1012	3
5	10	28	301	22	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	104	10	298.4	3	0	0	94	1012	7
5	10	28	301	23	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	97	10	298.4	3	0	0	94	1012	7
5	10	28	301	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	51	10	297.8	3	0	0	88	1012	7
5	10	29	302	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.4	3	0	0	94	1011	3
5	10	29	302	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.2	3	0	0	94	1010	3
5	10	29	302	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	44	10	297.1	3	0	0	94	1011	7
5	10	29	302	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	297.2	3	0	0	94	1011	7
5	10	29	302	5	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	88	10	297.4	3	0	0	94	1012	7
5	10	29	302	6	-4	0.073	-9	-9	-999	45	8.7	0.212	0.48	1	1.4	102	10	297.4	3	0	0	100	1013	7
5	10	29	302	7	-1.8	0.133	-9	-9	-999	112	118.7	0.562	0.7	0.46	1.1	57	10	297.2	3	0	0.76	94	1013	10
5	10	29	302	8	13.8	0.183	-9	-9	-999	180	-40.2	0.562	0.7	0.25	1.1	85	10	297.4	3	0	0	94	1014	10
5	10	29	302	9	45.4	0.218	-9	-9	-999	235	-20.7	0.562	0.7	0.19	1.2	72	10	298.5	3	0	0	94	1014	10
5	10	29	302	10	123.5	0.25	-9	-9	-999	288	-11.5	0.212	0.48	0.18	1.8	90	10	301.8	3	0	0	82	1014	6
5	10	29	302	11	40.1	0.244	-9	-9	-999	277	-32.8	0.212	0.48	0.18	2	130	10	300	3	0	2.29	77	1013	10
5	10	29	302	12	92	0.234	-9	-9	-999	260	-12.5	0.212	0.48	0.18	1.7	103	10	299.4	3	0	0.25	88	1011	9
5	10	29	302	13	85.5	0.213	-9	-9	-999	225	-10.1	0.212	0.48	0.18	1.5	92	10	301.5	3	0	0	82	1010	9
5	10	29	302	14	78.3	0.191	-9	-9	-999	193	-8.1	0.212	0.48	0.18	1.3	103	10	302.5	3	0	0	82	1011	9
5	10	29	302	15	48.1	0.219	-9	-9	-999	236	-19.8	0.212	0.48	0.19	1.7	104	10	302.4	3	0	0	85	1010	9
5	10	29	302	16	19.1	0.185	-9	-9	-999	183	-29.8	0.212	0.48	0.21	1.5	96	10	301.4	3	0	0	79	1010	10
5	10	29	302	17	0.1	0.136	-9	-9	-999	115	-2241.8	0.212	0.48	0.29	1.3	87	10	299.9	3	0	0	79	1010	10
5	10	29	302	18	-2.4	0.063	-9	-9	-999	38	9.4	0.562	0.7	0.64	0.9	75	10	299.1	3	0	0	82	1010	7
5	10	29	302	19	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	70	10	298.6	3	0	0	88	1011	7
5	10	29	302	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	95	10	298.4	3	0	0	94	1012	0
5	10	29	302	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	78	10	298.4	3	0	0	88	1012	7
5	10	29	302	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	298.1	3	0	0	94	1012	7
5	10	29	302	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	77	10	297.9	3	0	0	97	1012	7
5	10	29	302	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	61	10	297.9	3	0	0	94	1011	3
5	10	30	303	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	59	10	297.6	3	0	0	94	1010	3
5	10	30	303	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	297.8	3	0	0	97	1010	3
5	10	30	303	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	297.6	3	0	0	100	1010	7
5	10	30	303	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	103	10	297.6	3	0	0	100	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	10	30	303	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	297.9	3	0	0	100	1011	3
5	10	30	303	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	100	10	299	3	0	0	94	1012	3
5	10	30	303	7	-2.4	0.076	-9	-9	-999	49	16.8	0.562	0.7	0.46	1.1	81	10	302	3	0	0	88	1013	0
5	10	30	303	8	50.4	0.182	0.721	0.005	269	179	-10.9	0.212	0.48	0.25	1.3	86	10	302.8	3	0	0	85	1013	5
5	10	30	303	9	76.5	0.22	0.99	0.005	458	237	-12.6	0.212	0.48	0.2	1.6	116	10	302.4	3	0	1.02	75	1013	7
5	10	30	303	10	136.1	0.253	1.442	0.005	797	292	-10.7	0.212	0.48	0.18	1.8	124	10	303.8	3	0	0	75	1013	3
5	10	30	303	11	128.8	0.251	1.483	0.005	916	290	-11.1	0.212	0.48	0.18	1.8	104	10	305.4	3	0	0	72	1012	7
5	10	30	303	12	74.8	0.229	1.267	0.005	982	252	-14.5	0.212	0.48	0.18	1.7	119	10	304.2	3	0	0.76	70	1012	9
5	10	30	303	13	47.3	0.21	1.11	0.005	1042	221	-17.5	0.212	0.48	0.18	1.6	96	10	302.8	3	0	2.03	88	1010	10
5	10	30	303	14	36.2	0.188	1.043	0.005	1129	188	-16.6	0.562	0.7	0.18	1	81	10	300.9	3	0	0.51	77	1010	10
5	10	30	303	15	25	0.194	0.931	0.005	1162	196	-26.2	0.562	0.7	0.18	1.1	75	10	301.4	3	0	0	85	1010	10
5	10	30	303	16	20.3	0.202	0.87	0.005	1169	209	-36.6	0.562	0.7	0.21	1.2	83	10	300.9	3	0	0	94	1010	10
5	10	30	303	17	0.1	0.084	0.148	0.005	1169	65	-543.5	0.212	0.48	0.29	0.8	86	10	300.2	3	0	0	85	1011	10
5	10	30	303	18	-1.4	0.049	-9	-9	-999	25	7.3	0.562	0.7	0.65	0.7	85	10	299.4	3	0	0	88	1011	7
5	10	30	303	19	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	298.8	3	0	0	88	1012	7
5	10	30	303	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	298.5	3	0	0	97	1012	7
5	10	30	303	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	84	10	298.4	3	0	0	94	1013	7
5	10	30	303	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	102	10	298.1	3	0	0	94	1013	7
5	10	30	303	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	85	10	298	3	0	0	91	1013	0
5	10	30	303	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	74	10	297.9	3	0	0	100	1012	3
5	10	31	304	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	66	10	297.4	3	0	0	94	1011	3
5	10	31	304	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	84	10	297.4	3	0	0	100	1010	3
5	10	31	304	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	297.8	3	0	0	100	1010	3
5	10	31	304	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	94	10	297.5	3	0	0	100	1010	3
5	10	31	304	5	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	97	10	297.6	3	0	0	97	1011	3
5	10	31	304	6	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	100	10	298.9	3	0	0	94	1012	3
5	10	31	304	7	-1.3	0.052	-9	-9	-999	27	9.6	0.212	0.48	0.47	1	104	10	302	3	0	0	94	1013	0
5	10	31	304	8	55	0.232	0.712	0.005	237	256	-20.4	0.212	0.48	0.25	1.8	128	10	303.2	3	0	0	82	1013	0
5	10	31	304	9	117.8	0.259	1.213	0.006	548	303	-13.3	0.212	0.48	0.2	1.9	134	10	304.6	3	0	0	80	1013	0
5	10	31	304	10	116.3	0.249	1.356	0.006	775	286	-12	0.212	0.48	0.18	1.8	124	10	305.1	3	0	0	75	1013	7
5	10	31	304	11	136.5	0.253	1.489	0.005	874	293	-10.7	0.212	0.48	0.18	1.8	115	10	305.9	3	0	0	68	1012	7
5	10	31	304	12	113.9	0.229	1.441	0.005	947	252	-9.5	0.212	0.48	0.18	1.6	128	10	305	3	0	0.76	62	1011	8
5	10	31	304	13	129.2	0.28	1.546	0.005	1033	342	-15.4	0.212	0.48	0.18	2.1	132	10	305.9	3	0	0	70	1010	7
5	10	31	304	14	74.7	0.238	1.308	0.005	1080	268	-16.3	0.212	0.48	0.18	1.8	124	10	304.4	3	0	0	72	1009	9
5	10	31	304	15	47.6	0.229	1.139	0.005	1119	252	-22.6	0.212	0.48	0.19	1.8	111	10	304.2	3	0	0	80	1010	10
5	10	31	304	16	11	0.177	0.701	0.005	1124	172	-45.5	0.212	0.48	0.21	1.5	119	10	302.8	3	0	0	80	1010	10
5	10	31	304	17	0.1	0.125	0.146	0.005	1121	102	-1771.1	0.212	0.48	0.29	1.2	86	10	301.4	3	0	0	80	1011	10
5	10	31	304	18	-2.4	0.063	-9	-9	-999	37	9.3	0.562	0.7	0.65	0.9	75	10	300.1	3	0	0	85	1012	7
5	10	31	304	19	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	79	10	299.5	3	0	0	83	1012	7
5	10	31	304	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	299.2	3	0	0	82	1013	7
5	10	31	304	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	84	10	298.9	3	0	0	88	1013	7
5	10	31	304	22	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	88	10	298.8	3	0	0	89	1013	0
5	10	31	304	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	298.5	3	0	0	91	1013	7
5	10	31	304	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	298.4	3	0	0	94	1012	7
5	11	1	305	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	298.1	3	0	0	94	1012	3
5	11	1	305	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	298	3	0	0	94	1011	7
5	11	1	305	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	297.9	3	0	0	94	1011	3
5	11	1	305	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	102	10	297.8	3	0	0	94	1011	3
5	11	1	305	5	-1	0.038	-9	-9	-999	17	5	0.736	0.77	1	0.5	140	10	297.5	3	0	0	100	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	1	305	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	102	10	298.4	3	0	0.25	94	1013	3
5	11	1	305	7	1.4	0.154	0.081	0.007	13	139	-230.7	0.655	0.64	0.47	1	83	10	299.9	3	0	0	94	1014	6
5	11	1	305	8	15.3	0.176	0.404	0.007	156	169	-32	0.37	0.38	0.25	1.2	96	10	298.9	3	0	0	94	1015	10
5	11	1	305	9	76.2	0.262	0.863	0.005	306	309	-21.4	0.37	0.38	0.2	1.7	121	10	301.2	3	0	0.25	82	1015	6
5	11	1	305	10	112.2	0.349	1.1	0.005	429	473	-34.2	0.37	0.38	0.19	2.4	111	10	303.8	3	0	0	85	1014	4
5	11	1	305	11	124.3	0.374	1.316	0.005	663	525	-38	0.37	0.38	0.19	2.6	111	10	304.4	3	0	0	80	1013	5
5	11	1	305	12	109.7	0.337	1.401	0.005	907	451	-31.6	0.37	0.38	0.18	2.3	105	10	304.9	3	0	0	70	1012	7
5	11	1	305	13	99.5	0.367	1.459	0.007	1126	512	-44.8	0.37	0.38	0.19	2.6	112	10	304.5	3	0	0	75	1011	8
5	11	1	305	14	89.3	0.332	1.477	0.008	1303	440	-36.9	0.37	0.38	0.19	2.3	111	10	304.4	3	0	0	66	1010	8
5	11	1	305	15	57.4	0.31	1.278	0.008	1311	396	-46.5	0.37	0.38	0.19	2.2	111	10	304.1	3	0	0	70	1010	9
5	11	1	305	16	27.6	0.261	1.002	0.008	1315	308	-58.4	0.37	0.38	0.21	1.9	108	10	303.2	3	0	0	70	1011	9
5	11	1	305	17	0.1	0.182	0.154	0.008	1314	181	-5469.9	0.37	0.38	0.3	1.5	102	10	301.1	3	0	0	70	1011	10
5	11	1	305	18	-2.9	0.067	-9	-9	-999	50	9.3	0.37	0.38	0.66	1.1	93	10	299.9	3	0	0	82	1012	7
5	11	1	305	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	106	10	299.1	3	0	0	88	1013	7
5	11	1	305	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	107	10	299	3	0	0	94	1013	7
5	11	1	305	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	107	10	299	3	0	0	88	1014	7
5	11	1	305	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	298.9	3	0	0	91	1014	7
5	11	1	305	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	298.4	3	0	0	94	1014	7
5	11	1	305	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	298.2	3	0	0	94	1013	7
5	11	2	306	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	298.2	3	0	0	94	1013	7
5	11	2	306	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	65	10	298.5	3	0	0	94	1012	7
5	11	2	306	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	65	10	298.2	3	0	0	88	1012	7
5	11	2	306	4	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	298.1	3	0	0	88	1013	7
5	11	2	306	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	59	10	297.9	3	0	0	94	1013	7
5	11	2	306	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	61	10	298.5	3	0	0	94	1014	7
5	11	2	306	7	-0.9	0.044	-9	-9	-999	21	8.8	0.655	0.64	0.47	0.6	54	10	299.8	3	0	0	88	1015	0
5	11	2	306	8	41.4	0.171	0.782	0.005	418	163	-10.9	0.37	0.38	0.26	1	92	10	302.9	3	0	0	88	1015	0
5	11	2	306	9	77.3	0.306	1.189	0.006	788	389	-33.5	0.37	0.38	0.2	2.1	112	10	304.1	3	0	0	75	1016	6
5	11	2	306	10	112.5	0.349	1.359	0.005	809	473	-34.1	0.37	0.38	0.19	2.4	119	10	304.8	3	0	0	66	1016	3
5	11	2	306	11	102.2	0.346	1.337	0.005	847	469	-36.8	0.37	0.38	0.19	2.4	118	10	305.1	3	0	0	68	1015	7
5	11	2	306	12	106.2	0.358	1.382	0.005	900	493	-39.1	0.37	0.38	0.19	2.5	134	10	305.4	3	0	0	66	1014	8
5	11	2	306	13	75.7	0.327	1.267	0.005	971	431	-41.8	0.37	0.38	0.19	2.3	114	10	304.5	3	0	0	62	1013	9
5	11	2	306	14	67.6	0.324	1.246	0.005	1035	425	-45.6	0.37	0.38	0.19	2.3	110	10	303.4	3	0	0	79	1013	9
5	11	2	306	15	42.3	0.302	1.081	0.005	1077	383	-58.9	0.37	0.38	0.19	2.2	114	10	303.9	3	0	0	70	1013	9
5	11	2	306	16	5.5	0.185	0.548	0.005	1079	189	-103.1	0.37	0.38	0.21	1.4	123	10	302.4	3	0	0	75	1012	10
5	11	2	306	17	0.1	0.134	0.144	0.005	1077	113	-2180.4	0.37	0.38	0.3	1.1	110	10	301.2	3	0	0	80	1013	10
5	11	2	306	18	-1.9	0.055	-9	-9	-999	32	7.6	0.37	0.38	0.66	0.9	105	10	300.4	3	0	0	88	1013	7
5	11	2	306	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	299.9	3	0	0	999	1013	7
5	11	2	306	20	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	98	10	299.5	3	0	0	999	1014	99
5	11	2	306	21	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	72	10	299.2	3	0	0	999	1014	99
5	11	2	306	22	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	58	10	298.5	3	0	0	999	1014	99
5	11	2	306	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	298.4	3	0	0	91	1014	3
5	11	2	306	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	298.4	3	0	0	94	1013	3
5	11	3	307	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	47	10	298.1	3	0	0	94	1013	3
5	11	3	307	2	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	59	10	297.9	3	0	0	97	1013	3
5	11	3	307	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	297.6	3	0	0	100	1013	3
5	11	3	307	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	83	10	297.5	3	0	0	100	1013	3
5	11	3	307	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	95	10	297.6	3	0	0	97	1014	0
5	11	3	307	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	298.4	3	0	0	94	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	3	307	7	-2.8	0.081	-9	-9	-999	53	16.7	0.655	0.64	0.47	1.1	73	10	301.9	3	0	0	94	1015	0
5	11	3	307	8	54.1	0.232	0.732	0.005	263	257	-20.9	0.37	0.38	0.26	1.5	89	10	303.2	3	0	0	88	1015	0
5	11	3	307	9	78.4	0.295	1.03	0.005	505	369	-29.7	0.37	0.38	0.2	2	96	10	304.1	3	0	0	66	1016	5
5	11	3	307	10	113.2	0.284	1.346	0.005	780	348	-18.3	0.37	0.38	0.19	1.8	98	10	304	3	0	1.02	63	1015	0
5	11	3	307	11	124.5	0.264	1.457	0.005	900	312	-13.4	0.37	0.38	0.19	1.6	94	10	304.9	3	0	0.25	61	1014	5
5	11	3	307	12	75.5	0.294	1.26	0.005	959	367	-30.5	0.37	0.38	0.19	2	98	10	304	3	0	2.29	62	1013	9
5	11	3	307	13	89.9	0.244	1.367	0.005	1028	278	-14.6	0.37	0.38	0.19	1.5	87	10	302.4	3	0	0.51	75	1012	8
5	11	3	307	14	71.5	0.271	1.291	0.005	1086	325	-25.2	0.37	0.38	0.19	1.8	94	10	303.8	3	0	0	82	1012	9
5	11	3	307	15	27.1	0.229	0.94	0.005	1106	252	-39.9	0.37	0.38	0.19	1.6	101	10	302.9	3	0	0	70	1012	10
5	11	3	307	16	2	0.211	0.392	0.005	1102	224	-433.4	0.37	0.38	0.21	1.7	98	10	299.4	3	0	7.62	82	1012	10
5	11	3	307	17	0.1	0.11	0.145	0.005	1101	88	-1208.1	0.37	0.38	0.3	0.9	116	10	298.5	3	0	0	85	1012	10
5	11	3	307	18	-1.2	0.042	-9	-9	-999	22	5.8	0.37	0.38	0.66	0.7	88	10	298.5	3	0	0	88	1012	7
5	11	3	307	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	298.4	3	0	0	89	1012	7
5	11	3	307	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	298.2	3	0	0	91	1012	7
5	11	3	307	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	72	10	298	3	0	0	92	1013	7
5	11	3	307	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	297.9	3	0	0	94	1013	7
5	11	3	307	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	90	10	297.9	3	0	0	85	1013	7
5	11	3	307	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	91	10	297.9	3	0	0	94	1012	3
5	11	4	308	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	297.9	3	0	0	100	1011	3
5	11	4	308	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	77	10	297.9	3	0	0	97	1010	0
5	11	4	308	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	55	10	297.2	3	0	0	94	1010	3
5	11	4	308	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	81	10	296.9	3	0	0	94	1010	3
5	11	4	308	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297	3	0	0	97	1011	3
5	11	4	308	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	117	10	297.4	3	0	0	100	1012	7
5	11	4	308	7	-1.6	0.098	-9	-9	-999	70	52.5	0.655	0.64	0.47	0.9	71	10	297.6	3	0	0.51	94	1012	10
5	11	4	308	8	49.6	0.177	0.514	0.005	99	171	-10	0.655	0.64	0.25	0.8	47	10	299.4	3	0	0	91	1013	7
5	11	4	308	9	120.1	0.254	1.044	0.005	342	295	-12.3	0.655	0.64	0.2	1.2	6	10	302.5	3	0	0	82	1013	0
5	11	4	308	10	87.8	0.246	1.081	0.005	520	280	-15.2	0.655	0.64	0.18	1.2	78	10	303.4	3	0	0	75	1013	9
5	11	4	308	11	63.1	0.203	1.041	0.005	645	210	-11.9	0.736	0.77	0.18	0.9	155	10	301.8	3	0	0	66	1012	10
5	11	4	308	12	32.5	-9	-9	-9	711	-999	-99999	0.542	0.56	0.17	0	0	10	301.8	3	0	4.83	56	1011	10
5	11	4	308	13	24.8	-9	-9	-9	756	-999	-99999	0.542	0.56	0.17	0	0	10	299.6	3	0	3.56	61	1010	10
5	11	4	308	14	48.5	0.19	1.047	0.005	854	190	-12.7	0.655	0.64	0.18	0.9	42	10	299.9	3	0	4.57	77	1010	10
5	11	4	308	15	22.8	0.188	0.829	0.005	899	187	-26.2	0.655	0.64	0.18	1	56	10	299.5	3	0	0	79	1009	10
5	11	4	308	16	6.4	0.181	0.545	0.005	911	177	-83.3	0.655	0.64	0.21	1.1	75	10	299.5	3	0	0	88	1010	10
5	11	4	308	17	0.1	0.11	0.136	0.005	909	85	-1206.1	0.37	0.38	0.3	0.9	94	10	298.9	3	0	0	91	1010	10
5	11	4	308	18	-5.5	0.091	-9	-9	-999	63	12.4	0.37	0.38	0.67	1.5	94	10	297.9	3	0	7.37	88	1010	7
5	11	4	308	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	297.2	3	0	0.25	92	1010	7
5	11	4	308	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	67	10	297.6	3	0	0	97	1012	7
5	11	4	308	21	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	86	10	297.8	3	0	2.29	94	1012	7
5	11	4	308	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	69	10	297.8	3	0	0.25	94	1012	7
5	11	4	308	23	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	94	10	297.6	3	0	0	100	1011	7
5	11	4	308	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	97	10	297.8	3	0	0	94	1011	7
5	11	5	309	1	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	97	10	297.9	3	0	1.27	94	1010	7
5	11	5	309	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	54	10	297.1	3	0	2.54	97	1010	7
5	11	5	309	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	70	10	297	3	0	0	100	1009	7
5	11	5	309	4	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	94	10	297.2	3	0	0	100	1009	7
5	11	5	309	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	94	10	297.4	3	0	0	94	1010	7
5	11	5	309	6	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	298.1	3	0	0	94	1010	7
5	11	5	309	7	-2.4	0.067	-9	-9	-999	40	11.3	0.37	0.38	0.48	1.1	87	10	299.5	3	0	0	88	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	5	309	8	25.6	0.255	0.45	0.005	129	296	-58.5	0.655	0.64	0.25	1.5	80	10	300	3	0	0	91	1012	9
5	11	5	309	9	32.8	0.221	0.556	0.005	189	240	-29.9	0.37	0.38	0.2	1.5	86	10	299.8	3	0	0	88	1012	9
5	11	5	309	10	65.2	0.237	0.825	0.005	310	265	-18.3	0.37	0.38	0.19	1.5	86	10	301.2	3	0	0	88	1012	9
5	11	5	309	11	134.9	0.325	1.282	0.006	563	426	-23	0.655	0.64	0.18	1.7	84	10	302.9	3	0	0	80	1011	8
5	11	5	309	12	159.1	0.371	1.527	0.005	807	519	-28.8	0.655	0.64	0.18	2	72	10	304.1	3	0	0	70	1010	7
5	11	5	309	13	99.5	0.28	1.338	0.005	868	345	-19.9	0.37	0.38	0.19	1.8	92	10	304.4	3	0	0	70	1009	8
5	11	5	309	14	55.7	0.312	1.118	0.005	901	401	-49.1	0.655	0.64	0.18	1.8	80	10	303.4	3	0	0	72	1008	10
5	11	5	309	15	16.4	0.264	0.745	0.005	908	313	-101	0.37	0.38	0.19	2	97	10	301	3	0	0.51	75	1008	10
5	11	5	309	16	3	0.173	0.424	0.005	908	169	-155.2	0.655	0.64	0.21	1.1	77	10	299.8	3	0	0	94	1009	10
5	11	5	309	17	0.1	0.122	0.136	0.005	907	99	-1640.9	0.37	0.38	0.3	1	100	10	298.9	3	0	0	91	1009	7
5	11	5	309	18	-2.9	0.067	-9	-9	-999	40	9.1	0.37	0.38	0.67	1.1	109	10	298.9	3	0	0	88	1009	7
5	11	5	309	19	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	61	10	297.4	3	0	0.25	100	1010	7
5	11	5	309	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	297.2	3	0	0	97	1010	7
5	11	5	309	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	297.5	3	0	0	100	1010	7
5	11	5	309	22	-4.8	0.079	-9	-9	-999	51	9.1	0.37	0.38	1	1.3	122	10	297.9	3	0	1.27	98	1011	3
5	11	5	309	23	-0.7	0.03	-9	-9	-999	13	3.4	0.37	0.38	1	0.5	115	10	297.4	3	0	2.29	97	1011	0
5	11	5	309	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	76	10	297.1	3	0	0.51	94	1010	7
5	11	6	310	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	297.2	3	0	0	100	1009	7
5	11	6	310	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	297	3	0	0	97	1009	7
5	11	6	310	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	297.1	3	0	0	100	1009	7
5	11	6	310	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	117	10	297.2	3	0	0	94	1009	3
5	11	6	310	5	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	118	10	297.5	3	0	0	97	1010	7
5	11	6	310	6	-2.9	0.069	-9	-9	-999	42	10.1	0.736	0.77	1	0.9	151	10	298	3	0	0	94	1010	7
5	11	6	310	7	-1.6	0.055	-9	-9	-999	29	9.1	0.37	0.38	0.48	0.9	111	10	299.5	3	0	0	100	1011	0
5	11	6	310	8	69.4	0.19	0.753	0.005	222	191	-9	0.736	0.77	0.25	0.8	156	10	302	3	0	0	88	1012	0
5	11	6	310	9	114.8	0.318	1.133	0.005	458	413	-25.3	0.736	0.77	0.19	1.6	181	10	302.8	3	0	0	79	1012	6
5	11	6	310	10	101.5	0.273	1.309	0.005	799	328	-18	0.736	0.77	0.18	1.3	163	10	303	3	0	0	88	1013	9
5	11	6	310	11	34.5	-9	-9	-9	835	-999	-99999	0.542	0.56	0.17	0	0	10	302.4	3	0	0	82	1012	10
5	11	6	310	12	62.8	-9	-9	-9	902	-999	-99999	0.542	0.56	0.17	0	0	10	301.9	3	0	0	79	1010	10
5	11	6	310	13	169	0.318	1.721	0.005	1087	412	-17.1	0.736	0.77	0.17	1.5	158	10	304.2	3	0	0	75	1009	7
5	11	6	310	14	47	0.305	1.139	0.005	1133	387	-54.3	0.37	0.38	0.19	2.2	122	10	302	3	0	1.02	70	1009	10
5	11	6	310	15	0.1	0.134	0.146	0.005	1125	136	-2173.9	0.37	0.38	0.19	1.1	137	10	298	3	0	2.54	100	1009	10
5	11	6	310	16	0.3	0.089	0.203	0.005	1125	61	-233.5	0.37	0.38	0.21	0.7	110	10	298	3	0	1.52	100	1009	10
5	11	6	310	17	0.1	0.118	0.147	0.005	1125	94	-1494.9	0.655	0.64	0.3	0.8	62	10	298	3	0	0	88	1009	7
5	11	6	310	18	-3.2	0.081	-9	-9	-999	53	14.6	0.655	0.64	0.66	1.1	69	10	297.9	3	0	0	94	1009	10
5	11	6	310	19	-2.5	0.067	-9	-9	-999	40	10.7	0.37	0.38	1	1.1	103	10	297.8	3	0	0	94	1010	10
5	11	6	310	20	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	1	0.7	68	10	297.8	3	0	0	94	1011	10
5	11	6	310	21	-1.3	0.049	-9	-9	-999	25	7.8	0.37	0.38	1	0.8	104	10	297.8	3	0	0	94	1011	10
5	11	6	310	22	-1.3	0.049	-9	-9	-999	25	7.8	0.37	0.38	1	0.8	86	10	297.6	3	0	0	94	1012	10
5	11	6	310	23	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	83	10	297.5	3	0	0	94	1012	10
5	11	6	310	24	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	78	10	297.4	3	0	0	94	1011	10
5	11	7	311	1	-1	0.042	-9	-9	-999	20	6.8	0.37	0.38	1	0.7	97	10	297.4	3	0	0.25	94	1010	10
5	11	7	311	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	81	10	297.5	3	0	0	100	1010	7
5	11	7	311	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	61	10	297.4	3	0	0	94	1009	7
5	11	7	311	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	297.2	3	0	0	94	1010	7
5	11	7	311	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	88	10	297.2	3	0	0	94	1010	7
5	11	7	311	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	297.5	3	0	0	88	1011	7
5	11	7	311	7	-1.6	0.055	-9	-9	-999	29	9	0.37	0.38	0.49	0.9	110	10	299.5	3	0	0	94	1012	0
5	11	7	311	8	40.2	0.247	0.692	0.005	297	283	-33.9	0.37	0.38	0.26	1.7	118	10	301.6	3	0	0	88	1013	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	7	311	9	60.5	0.246	0.951	0.005	514	280	-22.1	0.37	0.38	0.2	1.6	111	10	302.1	3	0	0	82	1013	7
5	11	7	311	10	95.9	0.268	1.291	0.005	812	320	-18.2	0.37	0.38	0.19	1.7	110	10	303.4	3	0	0	85	1013	7
5	11	7	311	11	146.4	0.367	1.587	0.007	986	512	-30.6	0.736	0.77	0.18	1.9	159	10	303.5	3	0	0	79	1012	8
5	11	7	311	12	98.1	0.34	1.442	0.007	1103	456	-36	0.736	0.77	0.17	1.8	154	10	303.1	3	0	0	75	1010	9
5	11	7	311	13	75	0.24	1.354	0.007	1192	274	-16.5	0.37	0.38	0.19	1.5	120	10	302.9	3	0	0	75	1009	9
5	11	7	311	14	47.2	0.251	1.169	0.007	1219	289	-30	0.37	0.38	0.19	1.7	93	10	302.5	3	0	0	70	1009	10
5	11	7	311	15	59.6	0.267	1.273	0.007	1246	317	-28.7	0.37	0.38	0.19	1.8	92	10	303.5	3	0	0	65	1008	9
5	11	7	311	16	11.2	0.204	0.731	0.007	1249	213	-67.7	0.37	0.38	0.22	1.5	99	10	301.6	3	0	0	70	1009	10
5	11	7	311	17	0.1	0.134	0.152	0.007	1248	114	-2172.4	0.37	0.38	0.3	1.1	100	10	300.4	3	0	0	77	1009	7
5	11	7	311	18	-2.4	0.061	-9	-9	-999	36	8.3	0.37	0.38	0.67	1	86	10	299.5	3	0	0	82	1009	7
5	11	7	311	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	299.1	3	0	0	88	1010	7
5	11	7	311	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	298.6	3	0	0	85	1011	7
5	11	7	311	21	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	298.2	3	0	0	82	1012	3
5	11	7	311	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	297.9	3	0	0	94	1011	3
5	11	7	311	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	83	10	297.9	3	0	0	91	1011	3
5	11	7	311	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	63	10	297.6	3	0	0	94	1010	3
5	11	8	312	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	75	10	297.6	3	0	0	94	1010	3
5	11	8	312	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	114	10	297.4	3	0	0	94	1009	0
5	11	8	312	3	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	93	10	297.5	3	0	0	88	1009	3
5	11	8	312	4	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	80	10	297.2	3	0	0	94	1009	3
5	11	8	312	5	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	92	10	297	3	0	0	97	1010	0
5	11	8	312	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	297.6	3	0	0	94	1010	3
5	11	8	312	7	-3	0.073	-9	-9	-999	45	11.8	0.37	0.38	0.49	1.2	88	10	299.4	3	0	0	94	1012	0
5	11	8	312	8	33.3	0.222	0.376	0.005	58	240	-29.5	0.37	0.38	0.26	1.5	91	10	300	3	0	0	91	1012	7
5	11	8	312	9	86.9	0.298	0.797	0.005	210	374	-27.5	0.37	0.38	0.2	2	114	10	302.4	3	0	0	88	1012	0
5	11	8	312	10	123.1	0.33	1.134	0.005	427	435	-26.3	0.37	0.38	0.19	2.2	102	10	304	3	0	0	75	1012	0
5	11	8	312	11	114.2	0.36	1.258	0.005	628	498	-37	0.37	0.38	0.19	2.5	109	10	304.2	3	0	0	79	1011	6
5	11	8	312	12	81.5	0.318	1.203	0.005	770	414	-35.7	0.37	0.38	0.19	2.2	117	10	303.4	3	0	0	70	1010	9
5	11	8	312	13	46.1	0.272	1.029	0.006	850	327	-39.3	0.37	0.38	0.19	1.9	135	10	302.8	3	0	0	75	1009	10
5	11	8	312	14	31.9	0.254	0.929	0.006	904	294	-46	0.37	0.38	0.19	1.8	123	10	301.9	3	0	0	68	1008	10
5	11	8	312	15	45.4	0.239	1.076	0.007	985	269	-27	0.37	0.38	0.19	1.6	117	10	302.4	3	0	0	88	1008	9
5	11	8	312	16	19.9	0.191	0.826	0.007	1019	192	-31.4	0.37	0.38	0.22	1.3	97	10	302	3	0	0	79	1008	10
5	11	8	312	17	0.1	0.134	0.141	0.007	1012	114	-2171.7	0.37	0.38	0.31	1.1	114	10	300.1	3	0	0	80	1008	10
5	11	8	312	18	-1.6	0.049	-9	-9	-999	29	6.6	0.37	0.38	0.67	0.8	108	10	299.4	3	0	0	82	1009	7
5	11	8	312	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	298.9	3	0	0	94	1010	7
5	11	8	312	20	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	109	10	298.8	3	0	0	94	1010	3
5	11	8	312	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298.2	3	0	0	94	1011	7
5	11	8	312	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	61	10	298	3	0	0	100	1011	7
5	11	8	312	23	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	87	10	297.9	3	0	0	97	1010	3
5	11	8	312	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	297.6	3	0	0	100	1010	3
5	11	9	313	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	107	10	297.4	3	0	0	100	1009	3
5	11	9	313	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	297.5	3	0	0	97	1009	3
5	11	9	313	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	91	10	297.4	3	0	0	100	1009	3
5	11	9	313	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	134	10	297.2	3	0	0	100	1009	3
5	11	9	313	5	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	132	10	297	3	0	0	100	1009	0
5	11	9	313	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	298.2	3	0	0	100	1010	3
5	11	9	313	7	-1.6	0.055	-9	-9	-999	29	8.9	0.37	0.38	0.49	0.9	100	10	300.8	3	0	0	100	1011	0
5	11	9	313	8	39.2	0.158	0.629	0.005	229	145	-9.1	0.37	0.38	0.26	0.9	113	10	302.4	3	0	0	85	1012	4
5	11	9	313	9	64.7	0.203	0.867	0.005	363	210	-11.7	0.37	0.38	0.2	1.2	123	10	303.6	3	0	0	80	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	9	313	10	102.4	0.145	1.178	0.006	576	128	-2.7	0.655	0.64	0.18	0.5	352	10	303.9	3	0	0	75	1012	8
5	11	9	313	11	42.6	0.253	0.921	0.006	662	293	-34.3	0.655	0.64	0.18	1.4	348	10	302.4	3	0	0	68	1010	10
5	11	9	313	12	7.3	0.113	0.516	0.007	674	100	-17.6	0.265	0.28	0.14	0.8	290	10	299.9	3	0	35.05	70	1010	10
5	11	9	313	13	37.2	0.184	0.918	0.007	749	182	-15.2	0.655	0.64	0.18	0.9	53	10	298.9	3	0	8.64	70	1009	10
5	11	9	313	14	90.7	0.233	1.277	0.006	826	258	-12.5	0.655	0.64	0.18	1.1	78	10	301.4	3	0	0	82	1008	9
5	11	9	313	15	28.5	0.186	0.874	0.006	842	185	-20.4	0.37	0.38	0.19	1.2	90	10	300.1	3	0	0.51	94	1008	10
5	11	9	313	16	18.9	0.197	0.765	0.006	854	201	-36.5	0.655	0.64	0.21	1.1	69	10	300.1	3	0	0	82	1008	10
5	11	9	313	17	0.1	0.158	0.134	0.006	853	145	-3564.5	0.37	0.38	0.31	1.3	86	10	299.2	3	0	0	88	1009	10
5	11	9	313	18	-3.5	0.073	-9	-9	-999	48	9.8	0.37	0.38	0.68	1.2	100	10	298.4	3	0	0	94	1009	7
5	11	9	313	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	298.1	3	0	0	94	1010	7
5	11	9	313	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	98	10	298.4	3	0	0	94	1010	7
5	11	9	313	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	78	10	298.4	3	0	0	94	1010	7
5	11	9	313	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	298	3	0	0	94	1010	7
5	11	9	313	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	297.9	3	0	0	94	1010	7
5	11	9	313	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	298	3	0	0	94	1009	7
5	11	10	314	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	297.8	3	0	0	94	1009	3
5	11	10	314	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	69	10	297.4	3	0	0	94	1008	7
5	11	10	314	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	297.4	3	0	0	100	1008	3
5	11	10	314	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	64	10	297.2	3	0	0	100	1008	3
5	11	10	314	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	297.4	3	0	0	97	1009	7
5	11	10	314	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	93	10	298.4	3	0	0	94	1010	7
5	11	10	314	7	-1.7	0.055	-9	-9	-999	29	8.7	0.37	0.38	0.5	0.9	87	10	300.4	3	0	0	88	1011	0
5	11	10	314	8	53.5	0.221	0.737	0.005	270	239	-18.2	0.37	0.38	0.26	1.4	114	10	303	3	0	0	85	1012	0
5	11	10	314	9	93.8	0.29	1.108	0.005	524	358	-23.3	0.37	0.38	0.2	1.9	129	10	304.5	3	0	0	75	1012	0
5	11	10	314	10	98.8	0.291	1.288	0.007	781	361	-22.5	0.37	0.38	0.19	1.9	125	10	304.5	3	0	0	80	1011	6
5	11	10	314	11	81.8	0.275	1.242	0.006	844	332	-22.9	0.37	0.38	0.19	1.8	125	10	304.5	3	0	0	72	1010	8
5	11	10	314	12	33.8	0.202	0.932	0.006	862	211	-22.1	0.736	0.77	0.17	1	144	10	303	3	0	0	70	1010	10
5	11	10	314	13	71.3	0.154	1.213	0.005	900	140	-4.6	0.655	0.64	0.18	0.6	15	10	301.9	3	0	0	75	1009	10
5	11	10	314	14	112.2	0.28	1.442	0.005	962	340	-17.5	0.655	0.64	0.18	1.4	79	10	301.4	3	0	0	75	1008	8
5	11	10	314	15	34.1	0.178	0.976	0.005	981	177	-15	0.37	0.38	0.19	1.1	107	10	301.8	3	0	0	75	1008	10
5	11	10	314	16	8.6	0.146	0.618	0.005	985	128	-32.6	0.37	0.38	0.22	1	104	10	301	3	0	0	75	1008	10
5	11	10	314	17	0.1	0.139	0.14	0.005	983	119	-2404.4	0.736	0.77	0.3	0.9	171	10	299.6	3	0	0.25	77	1009	7
5	11	10	314	18	-2.8	0.069	-9	-9	-999	43	10.5	0.736	0.77	0.67	0.9	158	10	299.4	3	0	0	88	1009	7
5	11	10	314	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	120	10	299.1	3	0	0	88	1009	7
5	11	10	314	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	298.9	3	0	0	88	1010	7
5	11	10	314	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	69	10	298.4	3	0	0	88	1010	7
5	11	10	314	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	298	3	0	0	88	1010	7
5	11	10	314	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	297.9	3	0	0	94	1010	7
5	11	10	314	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	118	10	297.9	3	0	0	94	1009	7
5	11	11	315	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	297.9	3	0	0	94	1008	7
5	11	11	315	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	103	10	297.8	3	0	0	94	1008	0
5	11	11	315	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	116	10	297.4	3	0	0	100	1008	3
5	11	11	315	4	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	99	10	297.5	3	0	0	94	1008	3
5	11	11	315	5	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	102	10	297.5	3	0	0	97	1008	0
5	11	11	315	6	-1.5	0.046	-9	-9	-999	23	6	0.736	0.77	1	0.6	144	10	298.4	3	0	0	94	1009	3
5	11	11	315	7	-1.7	0.055	-9	-9	-999	29	8.8	0.37	0.38	0.5	0.9	128	10	301.9	3	0	0	88	1010	0
5	11	11	315	8	61.9	0.313	0.596	0.005	123	402	-44.5	0.736	0.77	0.25	1.7	145	10	302.6	3	0	0	79	1011	0
5	11	11	315	9	110.6	0.303	1.017	0.005	343	383	-22.6	0.736	0.77	0.19	1.5	173	10	302.6	3	0	0	79	1012	6
5	11	11	315	10	168.1	0.331	1.47	0.005	682	437	-19.4	0.736	0.77	0.18	1.6	175	10	304.6	3	0	0	75	1011	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	11	315	11	89.1	0.299	1.285	0.005	859	376	-27	0.37	0.38	0.19	2	139	10	303.9	3	0	0	75	1010	8
5	11	11	315	12	97.6	0.285	1.416	0.005	1049	350	-21.4	0.736	0.77	0.17	1.4	144	10	302.4	3	0	0	66	1009	9
5	11	11	315	13	30.9	0.215	0.984	0.005	1109	230	-28.8	0.736	0.77	0.17	1.1	188	10	301.6	3	0	0	85	1008	10
5	11	11	315	14	9.9	0.235	0.677	0.005	1124	262	-117.4	0.736	0.77	0.18	1.4	189	10	300.2	3	0	3.05	88	1008	10
5	11	11	315	15	3	0.092	0.455	0.005	1123	80	-23	0.37	0.38	0.19	0.6	103	10	298.4	3	0	4.57	100	1008	10
5	11	11	315	16	4.1	0.097	0.506	0.005	1131	70	-20.2	0.655	0.64	0.21	0.5	60	10	298.4	3	0	0.76	94	1008	10
5	11	11	315	17	0.1	0.118	0.147	0.005	1131	94	-1493.5	0.655	0.64	0.3	0.8	59	10	298.4	3	0	0.25	97	1008	10
5	11	11	315	18	-2.6	0.066	-9	-9	-999	39	9.8	0.655	0.64	0.67	0.9	79	10	298	3	0	0	100	1008	7
5	11	11	315	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	85	10	298	3	0	0	94	1009	7
5	11	11	315	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	94	10	297.9	3	0	0	94	1009	7
5	11	11	315	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	297.6	3	0	0	94	1010	7
5	11	11	315	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	67	10	297.6	3	0	0	94	1010	7
5	11	11	315	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	86	10	297.9	3	0	0	97	1010	0
5	11	11	315	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	297.8	3	0	0	100	1009	7
5	11	12	316	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	72	10	297.6	3	0	0	100	1009	7
5	11	12	316	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	297.4	3	0	0	100	1008	7
5	11	12	316	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	297.4	3	0	0	100	1008	3
5	11	12	316	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	114	10	297.2	3	0	0	100	1008	7
5	11	12	316	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	92	10	297.4	3	0	0	100	1008	7
5	11	12	316	6	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	98	10	298.5	3	0	0	100	1009	7
5	11	12	316	7	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	0.49	0.7	66	10	301.6	3	0	0	88	1009	0
5	11	12	316	8	52.2	0.198	0.688	0.005	225	203	-13.4	0.37	0.38	0.26	1.2	110	10	303.1	3	0	0	85	1010	0
5	11	12	316	9	88.8	0.255	1.056	0.005	479	297	-16.9	0.37	0.38	0.21	1.6	129	10	304.4	3	0	0	80	1010	0
5	11	12	316	10	109.9	0.249	1.336	0.006	783	287	-12.7	0.37	0.38	0.19	1.5	111	10	305.4	3	0	0	75	1010	0
5	11	12	316	11	106.1	0.226	1.402	0.005	936	248	-9.8	0.37	0.38	0.19	1.3	120	10	305.8	3	0	0	75	1009	7
5	11	12	316	12	48.8	0.217	1.108	0.005	1002	232	-18.8	0.655	0.64	0.18	1.1	353	10	303.6	3	0	0	66	1008	10
5	11	12	316	13	4.4	0.314	0.496	0.005	998	406	-635.4	0.655	0.64	0.18	2.1	351	10	298.4	3	0	3.56	70	1008	10
5	11	12	316	14	4.7	0.099	0.508	0.005	1006	129	-18.5	0.655	0.64	0.18	0.5	357	10	298.9	3	0	0	85	1007	10
5	11	12	316	15	21.1	0.146	0.849	0.005	1038	129	-13.3	0.655	0.64	0.19	0.7	52	10	299.9	3	0	0.25	79	1007	10
5	11	12	316	16	17.2	0.17	0.799	0.005	1064	161	-25.5	0.655	0.64	0.21	0.9	77	10	300.4	3	0	0	85	1007	10
5	11	12	316	17	0.1	0.09	0.144	0.005	1062	64	-650.3	0.655	0.64	0.3	0.6	55	10	299.6	3	0	0	82	1007	10
5	11	12	316	18	-0.8	0.037	-9	-9	-999	17	5.5	0.655	0.64	0.67	0.5	61	10	299.1	3	0	0	74	1008	7
5	11	12	316	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	298.9	3	0	0	82	1009	7
5	11	12	316	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	58	10	298.5	3	0	0	85	1009	7
5	11	12	316	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	62	10	298.1	3	0	0	82	1009	7
5	11	12	316	22	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	71	10	297.9	3	0	0	82	1009	7
5	11	12	316	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	95	10	297.9	3	0	0	94	1009	7
5	11	12	316	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	110	10	297.9	3	0	0	94	1009	3
5	11	13	317	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	125	10	297.9	3	0	0	100	1008	3
5	11	13	317	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	102	10	297.6	3	0	0	94	1008	3
5	11	13	317	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	297.4	3	0	0	94	1007	3
5	11	13	317	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.4	3	0	0	100	1007	3
5	11	13	317	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	296.9	3	0	0	94	1008	3
5	11	13	317	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	118	10	298.4	3	0	0	94	1008	7
5	11	13	317	7	-1	0.042	-9	-9	-999	20	6.7	0.37	0.38	0.5	0.7	109	10	302	3	0	0	94	1009	0
5	11	13	317	8	51.5	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.25	0	0	10	303.9	3	0	0	82	1009	3
5	11	13	317	9	59.2	0.151	-9	-9	-999	135	-5.2	0.655	0.64	0.2	0.6	19	10	302.8	3	0	0	70	1010	9
5	11	13	317	10	118.3	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.17	0	0	10	303.9	3	0	0	67	1009	7
5	11	13	317	11	106.3	0.26	-9	-9	-999	305	-14.9	0.265	0.28	0.14	1.8	252	10	305.8	3	0	0	64	1008	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	13	317	12	70.1	0.269	-9	-9	-999	321	-25	0.265	0.28	0.14	2	251	10	304.5	3	0	0	88	1008	8
5	11	13	317	13	180.6	0.285	-9	-9	-999	350	-11.5	0.686	0.72	0.15	1.3	247	10	305.5	3	0	0	91	1007	7
5	11	13	317	14	95.8	0.206	-9	-9	-999	217	-8.2	0.655	0.64	0.18	0.9	54	10	304.2	3	0	0	100	1007	9
5	11	13	317	15	50.5	0.231	-9	-9	-999	255	-21.9	0.655	0.64	0.19	1.2	78	10	301.2	3	0	1.02	94	1006	10
5	11	13	317	16	15.4	0.219	-9	-9	-999	236	-61.3	0.37	0.38	0.22	1.6	109	10	299.9	3	0	0	88	1006	10
5	11	13	317	17	0.1	0.133	-9	-9	-999	114	-2108.2	0.655	0.64	0.3	0.9	83	10	299	3	0	0	94	1007	10
5	11	13	317	18	-0.8	0.037	-9	-9	-999	26	5.6	0.686	0.72	0.65	0.5	231	10	298.2	3	0	12.45	94	1008	7
5	11	13	317	19	-1.7	0.052	-9	-9	-999	27	7.5	0.686	0.72	1	0.7	223	10	296.5	3	0	10.92	94	1009	7
5	11	13	317	20	-2.5	0.067	-9	-9	-999	40	10.7	0.37	0.38	1	1.1	103	10	296.6	3	0	2.03	97	1009	10
5	11	13	317	21	-2.5	0.067	-9	-9	-999	40	10.7	0.37	0.38	1	1.1	94	10	296.6	3	0	0.25	100	1009	10
5	11	13	317	22	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	1	0.7	62	10	296.9	3	0	0	94	1009	10
5	11	13	317	23	-0.7	0.036	-9	-9	-999	16	5.8	0.37	0.38	1	0.6	93	10	297	3	0	0	97	1009	10
5	11	13	317	24	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	95	10	297.4	3	0	0	100	1008	7
5	11	14	318	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	52	10	297.4	3	0	0	100	1007	7
5	11	14	318	2	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	68	10	297.2	3	0	0	97	1007	7
5	11	14	318	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.2	3	0	0	94	1006	7
5	11	14	318	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	94	1007	7
5	11	14	318	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	94	1008	10
5	11	14	318	6	-2.9	0.077	-9	-9	-999	49	13.8	0.736	0.77	1	1	164	10	298.5	3	0	0	100	1009	10
5	11	14	318	7	-2.5	0.183	-9	-9	-999	180	218.1	0.736	0.77	0.5	1.3	171	10	298.1	3	0	0	97	1010	7
5	11	14	318	8	7.1	0.259	-9	-9	-999	303	-221.3	0.736	0.77	0.26	1.6	156	10	297.4	3	0	0	94	1010	10
5	11	14	318	9	0.1	0.219	-9	-9	-999	236	-8888	0.37	0.38	0.21	1.8	126	10	297.2	3	0	2.29	94	1012	10
5	11	14	318	10	0.1	0.134	-9	-9	-999	115	-2177.5	0.37	0.38	0.19	1.1	115	10	296.9	3	0	3.81	100	1011	10
5	11	14	318	11	3.8	0.116	-9	-9	-999	90	-36.3	0.37	0.38	0.19	0.8	101	10	297	3	0	1.27	94	1010	10
5	11	14	318	12	22.1	0.2	-9	-9	-999	206	-32.6	0.655	0.64	0.18	1.1	85	10	297.6	3	0	0.25	94	1010	10
5	11	14	318	13	35.1	0.21	-9	-9	-999	221	-23.7	0.655	0.64	0.18	1.1	72	10	298.4	3	0	0	94	1009	10
5	11	14	318	14	14.5	0.262	-9	-9	-999	309	-112.1	0.37	0.38	0.19	2	127	10	298.9	3	0	0	94	1008	10
5	11	14	318	15	16.9	0.242	-9	-9	-999	275	-75.9	0.37	0.38	0.19	1.8	129	10	298.9	3	0	0	94	1007	10
5	11	14	318	16	11.5	0.172	-9	-9	-999	165	-39.6	0.37	0.38	0.22	1.2	102	10	299	3	0	0	94	1007	10
5	11	14	318	17	0.1	0.134	-9	-9	-999	113	-2170.3	0.37	0.38	0.31	1.1	98	10	298.4	3	0	0	88	1008	10
5	11	14	318	18	-3.5	0.073	-9	-9	-999	46	9.8	0.37	0.38	0.68	1.2	104	10	298	3	0	0	88	1008	7
5	11	14	318	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	297.9	3	0	0	88	1008	7
5	11	14	318	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	89	10	297.6	3	0	0	94	1009	7
5	11	14	318	21	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	105	10	297.8	3	0	0	94	1009	7
5	11	14	318	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	105	10	297.8	3	0	0	94	1009	7
5	11	14	318	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.1	3	0	0	94	1009	7
5	11	14	318	24	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	82	10	297.6	3	0	0	94	1009	7
5	11	15	319	1	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	136	10	297.9	3	0	0	94	1008	7
5	11	15	319	2	-8.2	0.109	-9	-9	-999	83	14.2	0.37	0.38	1	1.8	119	10	297.5	3	0	0	94	1008	7
5	11	15	319	3	-7.5	0.103	-9	-9	-999	76	13.1	0.655	0.64	1	1.4	80	10	296.9	3	0	0.25	94	1008	3
5	11	15	319	4	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	80	10	296.5	3	0	0	94	1008	7
5	11	15	319	5	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	75	10	296.9	3	0	0	94	1009	7
5	11	15	319	6	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	82	10	297	3	0	0.25	94	1009	7
5	11	15	319	7	-4	0.142	-9	-9	-999	124	65.7	0.736	0.77	0.5	1.2	146	10	297.2	3	0	3.05	94	1011	10
5	11	15	319	8	4.5	0.217	0.256	0.005	134	233	-205.4	0.655	0.64	0.26	1.4	85	10	297	3	0	4.06	94	1012	10
5	11	15	319	9	9.9	0.148	0.419	0.005	267	132	-29.4	0.37	0.38	0.21	1	104	10	297.4	3	0	0	94	1012	10
5	11	15	319	10	18.4	0.171	0.64	0.005	515	162	-24.5	0.655	0.64	0.18	0.9	59	10	297.6	3	0	0	94	1012	10
5	11	15	319	11	31.3	0.246	0.785	0.006	557	281	-42.9	0.655	0.64	0.18	1.4	75	10	298	3	0	0.25	97	1011	10
5	11	15	319	12	50	0.27	0.946	0.005	610	322	-35.4	0.655	0.64	0.18	1.5	77	10	299.1	3	0	0	100	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	15	319	13	99.3	0.329	1.254	0.005	715	433	-32.1	0.655	0.64	0.18	1.8	83	10	300.5	3	0	0	100	1009	9
5	11	15	319	14	13.3	0.217	0.646	0.005	728	238	-69.1	0.37	0.38	0.19	1.6	106	10	299.1	3	0	3.56	94	1009	10
5	11	15	319	15	6.6	0.121	0.513	0.005	735	101	-24.2	0.37	0.38	0.19	0.8	108	10	298	3	0	0.51	97	1008	10
5	11	15	319	16	8.9	0.125	0.57	0.005	745	102	-19.6	0.37	0.38	0.22	0.8	93	10	298.8	3	0	0.25	100	1008	10
5	11	15	319	17	0.1	0.118	0.128	0.005	745	94	-1494.5	0.655	0.64	0.3	0.8	71	10	299.2	3	0	0	94	1008	10
5	11	15	319	18	-1.6	0.051	-9	-9	-999	28	7.6	0.655	0.64	0.68	0.7	76	10	298.8	3	0	0	94	1009	7
5	11	15	319	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	90	10	298.4	3	0	0	94	1010	7
5	11	15	319	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	298.1	3	0	0	94	1010	7
5	11	15	319	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	298.1	3	0	0	94	1010	7
5	11	15	319	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	297.8	3	0	0	94	1011	7
5	11	15	319	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	297.8	3	0	0	94	1010	7
5	11	15	319	24	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	297.8	3	0	0	94	1010	3
5	11	16	320	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	297.2	3	0	0	94	1009	3
5	11	16	320	2	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	93	10	297.2	3	0	0	94	1009	7
5	11	16	320	3	-6.6	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	85	10	297	3	0	0	100	1009	7
5	11	16	320	4	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	83	10	296.5	3	0	0	100	1009	7
5	11	16	320	5	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	103	10	296.2	3	0	0	97	1009	7
5	11	16	320	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	102	10	296.6	3	0	0	100	1010	7
5	11	16	320	7	-3.3	0.073	-9	-9	-999	45	10.6	0.37	0.38	0.51	1.2	110	10	299.4	3	0	0	100	1010	0
5	11	16	320	8	46.6	0.261	0.611	0.005	176	307	-34.5	0.37	0.38	0.27	1.8	104	10	301.2	3	0	0	85	1011	0
5	11	16	320	9	61.4	0.268	0.808	0.005	310	318	-28.1	0.37	0.38	0.21	1.8	108	10	302	3	0	0	85	1012	7
5	11	16	320	10	79.5	0.274	1.036	0.005	504	330	-23.4	0.37	0.38	0.19	1.8	98	10	303.1	3	0	0	70	1011	8
5	11	16	320	11	107.8	0.326	1.358	0.006	838	428	-28.9	0.37	0.38	0.19	2.2	106	10	303.9	3	0	0	91	1010	7
5	11	16	320	12	79.2	0.252	1.281	0.006	955	294	-18.3	0.37	0.38	0.19	1.6	100	10	304	3	0	0	70	1009	9
5	11	16	320	13	77.9	0.252	1.316	0.007	1052	291	-18.5	0.37	0.38	0.19	1.6	108	10	303.9	3	0	0	70	1008	9
5	11	16	320	14	95.9	0.288	1.43	0.007	1098	355	-22.4	0.655	0.64	0.18	1.5	85	10	304.4	3	0	0	65	1008	9
5	11	16	320	15	34.6	0.244	1.024	0.007	1114	279	-37.9	0.37	0.38	0.19	1.7	90	10	303.2	3	0	0	65	1007	10
5	11	16	320	16	8.8	0.201	0.65	0.007	1116	207	-82.3	0.37	0.38	0.22	1.5	106	10	301.8	3	0	0	70	1007	10
5	11	16	320	17	0.1	0.146	0.146	0.007	1115	129	-2808.6	0.37	0.38	0.31	1.2	108	10	300.4	3	0	0	75	1008	10
5	11	16	320	18	-3.4	0.067	-9	-9	-999	42	7.9	0.37	0.38	0.68	1.1	105	10	299.4	3	0	0	82	1008	3
5	11	16	320	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	96	10	299.1	3	0	0	88	1009	3
5	11	16	320	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	298.8	3	0	0	88	1009	7
5	11	16	320	21	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	76	10	298.4	3	0	0	94	1009	7
5	11	16	320	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.1	3	0	0	85	1009	7
5	11	16	320	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	297.9	3	0	0	88	1010	7
5	11	16	320	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	297.9	3	0	0	88	1009	7
5	11	17	321	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	297.8	3	0	0	88	1008	7
5	11	17	321	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	104	10	297.4	3	0	0	94	1007	7
5	11	17	321	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	119	10	297.1	3	0	0	94	1007	7
5	11	17	321	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	100	10	297.5	3	0	0	100	1008	7
5	11	17	321	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	112	10	297.4	3	0	0	97	1008	7
5	11	17	321	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	128	10	297.8	3	0	0	94	1009	7
5	11	17	321	7	-1.1	0.042	-9	-9	-999	20	6.1	0.37	0.38	0.52	0.7	133	10	299.8	3	0	0	88	1010	0
5	11	17	321	8	50.9	0.177	0.459	0.005	68	172	-9.8	0.655	0.64	0.26	0.8	68	10	301.8	3	0	0	74	1010	5
5	11	17	321	9	81.9	0.188	0.742	0.005	179	187	-7.3	0.655	0.64	0.2	0.8	80	10	302.9	3	0	0	75	1010	8
5	11	17	321	10	87.5	0.136	0.899	0.005	299	116	-2.6	0.37	0.38	0.19	0.6	110	10	304.6	3	0	0	66	1010	7
5	11	17	321	11	75.4	0.242	0.943	0.005	400	273	-16.8	0.655	0.64	0.18	1.2	342	10	303.2	3	0	0	82	1009	9
5	11	17	321	12	9.7	0.18	0.479	0.005	409	177	-54.3	0.736	0.77	0.17	1	140	10	299.8	3	0	6.86	75	1009	10
5	11	17	321	13	18.4	0.112	0.605	0.005	433	87	-6.8	0.37	0.38	0.19	0.6	100	10	299.1	3	0	4.06	70	1007	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	17	321	14	54.3	-9	-9	-9	510	-999	-99999	0.542	0.56	0.17	0	0	10	301.9	3	0	0	72	1007	10
5	11	17	321	15	27.3	0.122	0.746	0.005	546	98	-6	0.655	0.64	0.19	0.5	81	10	301.4	3	0	0	79	1007	10
5	11	17	321	16	9.7	0.191	0.532	0.005	559	192	-64.5	0.37	0.38	0.22	1.4	89	10	300.9	3	0	0	88	1006	10
5	11	17	321	17	0.1	0.134	0.116	0.005	556	114	-2167.4	0.37	0.38	0.31	1.1	97	10	299.5	3	0	0	91	1006	10
5	11	17	321	18	-3	0.067	-9	-9	-999	41	9	0.37	0.38	0.68	1.1	104	10	298.5	3	0	0	88	1007	7
5	11	17	321	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	298.2	3	0	0	88	1007	7
5	11	17	321	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	74	10	298	3	0	0	94	1008	7
5	11	17	321	21	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	80	10	297.9	3	0	0	93	1008	0
5	11	17	321	22	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	87	10	297.9	3	0	0	92	1008	0
5	11	17	321	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297.8	3	0	0	91	1008	7
5	11	17	321	24	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	85	10	297.6	3	0	0	95	1007	0
5	11	18	322	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	297.5	3	0	0	100	1007	7
5	11	18	322	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	81	10	297.8	3	0	0	100	1006	7
5	11	18	322	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	297.6	3	0	0	100	1006	7
5	11	18	322	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	73	10	297.4	3	0	0	100	1006	7
5	11	18	322	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	93	10	297.4	3	0	0	100	1007	7
5	11	18	322	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	76	10	298.1	3	0	0	100	1007	7
5	11	18	322	7	-2.8	0.067	-9	-9	-999	40	9.5	0.37	0.38	0.52	1.1	89	10	299.5	3	0	0	94	1008	0
5	11	18	322	8	34.9	0.168	-9	-9	-999	158	-12.2	0.37	0.38	0.27	1	119	10	301	3	0	0	91	1009	5
5	11	18	322	9	72.4	0.194	-9	-9	-999	196	-9.1	0.37	0.38	0.21	1.1	120	10	302.8	3	0	0	82	1010	5
5	11	18	322	10	97.1	0.212	-9	-9	-999	225	-8.9	0.37	0.38	0.19	1.2	113	10	303.9	3	0	0	70	1009	6
5	11	18	322	11	90.8	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.17	0	0	10	304.4	3	0	0	75	1009	9
5	11	18	322	12	32.9	0.208	-9	-9	-999	219	-24.7	0.655	0.64	0.18	1.1	45	10	301.1	3	0	2.29	80	1008	10
5	11	18	322	13	17.4	0.099	-9	-9	-999	77	-5	0.37	0.38	0.19	0.5	92	10	299.9	3	0	3.05	80	1007	10
5	11	18	322	14	59.6	0.222	-9	-9	-999	241	-16.5	0.655	0.64	0.18	1.1	79	10	300.5	3	0	0.25	91	1006	10
5	11	18	322	15	56.8	0.233	-9	-9	-999	259	-20.1	0.37	0.38	0.19	1.5	110	10	302.9	3	0	0	75	1006	9
5	11	18	322	16	14.9	0.186	-9	-9	-999	185	-39	0.37	0.38	0.22	1.3	114	10	301.9	3	0	0	75	1006	10
5	11	18	322	17	0.1	0.158	-9	-9	-999	145	-3558.6	0.37	0.38	0.31	1.3	103	10	300.4	3	0	0	79	1007	10
5	11	18	322	18	-3	0.067	-9	-9	-999	43	9	0.37	0.38	0.68	1.1	100	10	299	3	0	0	77	1007	7
5	11	18	322	19	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	111	10	298.4	3	0	0	88	1008	7
5	11	18	322	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	85	10	298	3	0	0	90	1009	7
5	11	18	322	21	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	128	10	297.9	3	0	0	94	1009	7
5	11	18	322	22	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	138	10	297.6	3	0	0	94	1010	7
5	11	18	322	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	121	10	297.2	3	0	0	94	1009	7
5	11	18	322	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	296.8	3	0	0	100	1009	3
5	11	19	323	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	61	10	296.1	3	0	0	94	1008	3
5	11	19	323	2	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	81	10	296.4	3	0	0	94	1008	7
5	11	19	323	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	296.5	3	0	0	100	1008	7
5	11	19	323	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	95	10	296.9	3	0	0	100	1008	7
5	11	19	323	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	88	10	297.2	3	0	0	94	1008	7
5	11	19	323	6	-2.2	0.066	-9	-9	-999	39	11.6	0.655	0.64	1	0.9	85	10	297.8	3	0	0	94	1009	10
5	11	19	323	7	-5.3	0.095	-9	-9	-999	68	14.9	0.655	0.64	0.52	1.3	81	10	299.6	3	0	0	94	1010	0
5	11	19	323	8	34.6	0.222	0.507	0.006	136	241	-28.7	0.37	0.38	0.27	1.5	98	10	300.8	3	0	0	88	1011	4
5	11	19	323	9	63.8	0.268	0.758	0.006	246	320	-27.3	0.37	0.38	0.21	1.8	102	10	302.2	3	0	0	82	1012	7
5	11	19	323	10	26.9	0.305	0.6	0.005	289	387	-95	0.37	0.38	0.19	2.3	131	10	298.9	3	0	0.76	80	1012	10
5	11	19	323	11	19.2	0.223	0.555	0.006	321	244	-52	0.37	0.38	0.19	1.6	131	10	297.9	3	0	2.54	97	1012	10
5	11	19	323	12	16.6	0.21	0.544	0.006	349	221	-50	0.37	0.38	0.19	1.5	135	10	297.5	3	0	6.35	94	1011	10
5	11	19	323	13	42	0.205	0.789	0.005	421	213	-18.4	0.37	0.38	0.19	1.3	116	10	298.4	3	0	0.51	94	1010	10
5	11	19	323	14	48	0.216	0.876	0.005	504	232	-19	0.655	0.64	0.18	1.1	83	10	299.1	3	0	0	88	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	19	323	15	21.8	0.203	0.69	0.005	541	211	-34.6	0.37	0.38	0.19	1.4	93	10	298.9	3	0	0	88	1009	10
5	11	19	323	16	11.4	0.172	0.562	0.005	560	164	-40	0.37	0.38	0.22	1.2	92	10	298.8	3	0	0	82	1009	10
5	11	19	323	17	0.1	0.11	0.116	0.005	559	85	-1204.9	0.37	0.38	0.31	0.9	102	10	298.1	3	0	0	85	1009	10
5	11	19	323	18	-2	0.055	-9	-9	-999	30	7.3	0.37	0.38	0.68	0.9	95	10	297.4	3	0	0	88	1009	7
5	11	19	323	19	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	95	10	297.2	3	0	0	90	1010	7
5	11	19	323	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	297.1	3	0	0	94	1011	7
5	11	19	323	21	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	76	10	297.4	3	0	0	94	1012	7
5	11	19	323	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	297.8	3	0	0	94	1012	7
5	11	19	323	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	59	10	297.2	3	0	0	94	1011	7
5	11	19	323	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	65	10	296.9	3	0	0	94	1010	7
5	11	20	324	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	71	10	296.8	3	0	0	94	1010	3
5	11	20	324	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	81	10	296.8	3	0	0	90	1010	7
5	11	20	324	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	80	10	296.9	3	0	0	94	1009	7
5	11	20	324	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	104	10	296.6	3	0	0	94	1010	3
5	11	20	324	5	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	119	10	296.8	3	0	0	97	1010	3
5	11	20	324	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	297.2	3	0	0	94	1011	7
5	11	20	324	7	-1.9	0.055	-9	-9	-999	29	7.5	0.37	0.38	0.53	0.9	102	10	298.4	3	0	0	94	1012	0
5	11	20	324	8	30.6	0.214	0.522	0.006	168	228	-29.1	0.736	0.77	0.26	1.1	155	10	298.5	3	0	0	91	1013	9
5	11	20	324	9	75	0.24	0.834	0.005	279	270	-16.6	0.37	0.38	0.21	1.5	105	10	301.6	3	0	0	82	1012	0
5	11	20	324	10	83.1	0.254	0.974	0.005	401	294	-17.7	0.37	0.38	0.19	1.6	103	10	303.1	3	0	0	85	1012	7
5	11	20	324	11	94.2	0.29	1.161	0.005	600	359	-23.3	0.37	0.38	0.19	1.9	116	10	304.4	3	0	0	75	1011	8
5	11	20	324	12	95.8	0.312	1.297	0.005	822	400	-28.5	0.37	0.38	0.19	2.1	118	10	304.6	3	0	0	70	1010	8
5	11	20	324	13	102.7	0.292	1.379	0.005	920	363	-21.9	0.37	0.38	0.19	1.9	110	10	303.4	3	0	0	80	1009	7
5	11	20	324	14	69.1	0.314	1.238	0.005	989	405	-40.4	0.37	0.38	0.19	2.2	119	10	304.1	3	0	0	65	1009	9
5	11	20	324	15	49.7	0.306	1.127	0.005	1036	390	-52	0.37	0.38	0.19	2.2	120	10	303.9	3	0	0	75	1009	9
5	11	20	324	16	18.9	0.255	0.82	0.005	1053	297	-79.2	0.37	0.38	0.22	1.9	113	10	302.8	3	0	0	70	1009	10
5	11	20	324	17	0.1	0.134	0.143	0.005	1049	120	-2173.2	0.37	0.38	0.31	1.1	108	10	300.9	3	0	0	75	1009	10
5	11	20	324	18	-1.6	0.049	-9	-9	-999	30	6.6	0.37	0.38	0.68	0.8	101	10	300	3	0	0	77	1009	7
5	11	20	324	19	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	55	10	299.4	3	0	0	88	1010	7
5	11	20	324	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	80	10	298.8	3	0	0	88	1010	7
5	11	20	324	21	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	83	10	298.4	3	0	0	88	1010	7
5	11	20	324	22	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	80	10	298.1	3	0	0	94	1011	7
5	11	20	324	23	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	91	10	297.9	3	0	0	94	1010	0
5	11	20	324	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	88	10	297.9	3	0	0	94	1010	3
5	11	21	325	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	83	10	297.8	3	0	0	94	1009	3
5	11	21	325	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	297.5	3	0	0	97	1009	3
5	11	21	325	3	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	81	10	297.5	3	0	0	94	1008	3
5	11	21	325	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	67	10	297.4	3	0	0	94	1009	3
5	11	21	325	5	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	297.4	3	0	0	97	1009	3
5	11	21	325	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	109	10	298.4	3	0	0	94	1010	7
5	11	21	325	7	-2.9	0.067	-9	-9	-999	40	9.4	0.37	0.38	0.53	1.1	106	10	301.4	3	0	0	100	1010	0
5	11	21	325	8	27.9	0.218	0.711	0.005	464	235	-33.7	0.37	0.38	0.27	1.5	131	10	301.9	3	0	0	85	1012	8
5	11	21	325	9	82.9	0.253	1.178	0.005	712	292	-17.6	0.736	0.77	0.2	1.2	153	10	302.4	3	0	0	80	1012	8
5	11	21	325	10	79.4	0.265	1.19	0.005	765	314	-21.1	0.736	0.77	0.18	1.3	146	10	303.2	3	0	0	70	1011	9
5	11	21	325	11	59	0.19	1.098	0.005	809	192	-10.4	0.37	0.38	0.19	1.1	127	10	303.9	3	0	0	65	1010	9
5	11	21	325	12	83.2	0.242	1.264	0.005	875	274	-15.4	0.37	0.38	0.19	1.5	111	10	304.8	3	0	0	66	1009	8
5	11	21	325	13	82	0.275	1.289	0.005	940	332	-22.8	0.37	0.38	0.19	1.8	109	10	304.9	3	0	0	66	1008	8
5	11	21	325	14	64.2	0.28	1.209	0.005	990	340	-30.6	0.37	0.38	0.19	1.9	117	10	304.4	3	0	0	65	1008	9
5	11	21	325	15	37.2	0.278	1.017	0.005	1017	338	-52.1	0.37	0.38	0.19	2	117	10	303.4	3	0	0	61	1008	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	21	325	16	11.4	0.248	0.688	0.005	1025	285	-120.4	0.37	0.38	0.22	1.9	122	10	302.2	3	0	0	70	1008	10
5	11	21	325	17	0.1	0.146	0.142	0.005	1023	132	-2810.5	0.37	0.38	0.31	1.2	122	10	300.9	3	0	0	74	1009	10
5	11	21	325	18	-2	0.055	-9	-9	-999	35	7.4	0.37	0.38	0.68	0.9	105	10	299.6	3	0	0	82	1009	7
5	11	21	325	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	299	3	0	0	88	1009	7
5	11	21	325	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	298.5	3	0	0	88	1010	7
5	11	21	325	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	60	10	298	3	0	0	88	1010	7
5	11	21	325	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.6	3	0	0	94	1009	7
5	11	21	325	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.4	3	0	0	97	1009	7
5	11	21	325	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	110	10	297.4	3	0	0	100	1009	7
5	11	22	326	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	114	10	297.2	3	0	0	94	1008	7
5	11	22	326	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	296.9	3	0	0	97	1008	7
5	11	22	326	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	296.6	3	0	0	100	1008	7
5	11	22	326	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	77	10	296.5	3	0	0	100	1008	7
5	11	22	326	5	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	89	10	296.6	3	0	0	100	1008	0
5	11	22	326	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	297.8	3	0	0	100	1009	7
5	11	22	326	7	-2.6	0.066	-9	-9	-999	39	10	0.655	0.64	0.53	0.9	83	10	300.1	3	0	0	94	1010	0
5	11	22	326	8	52	0.22	0.733	0.005	273	238	-18.5	0.37	0.38	0.28	1.4	106	10	302.4	3	0	0	82	1011	0
5	11	22	326	9	71.3	0.25	1.153	0.005	776	287	-19.7	0.37	0.38	0.21	1.6	100	10	303.4	3	0	0	75	1011	5
5	11	22	326	10	93.5	0.256	1.325	0.005	898	298	-16.2	0.37	0.38	0.19	1.6	110	10	304.4	3	0	0	65	1011	6
5	11	22	326	11	124.3	0.309	1.54	0.006	1060	394	-21.3	0.37	0.38	0.19	2	124	10	305.2	3	0	0	63	1010	3
5	11	22	326	12	101	0.27	1.495	0.008	1193	323	-17.5	0.37	0.38	0.19	1.7	116	10	305.4	3	0	0	58	1009	7
5	11	22	326	13	56.8	0.233	1.259	0.008	1265	260	-20.1	0.37	0.38	0.19	1.5	108	10	304.4	3	0	0	52	1008	9
5	11	22	326	14	65.4	0.248	1.35	0.01	1351	283	-20.8	0.37	0.38	0.19	1.6	106	10	304.5	3	0	0	61	1007	9
5	11	22	326	15	39.7	0.247	1.149	0.01	1374	282	-34.1	0.37	0.38	0.19	1.7	112	10	303.8	3	0	0	65	1007	9
5	11	22	326	16	25.1	0.227	0.988	0.01	1381	250	-42.1	0.37	0.38	0.22	1.6	110	10	303.2	3	0	0	63	1007	10
5	11	22	326	17	0.1	0.146	0.157	0.01	1380	130	-2806.8	0.37	0.38	0.31	1.2	110	10	300.9	3	0	0	70	1007	10
5	11	22	326	18	-2.4	0.061	-9	-9	-999	38	8.2	0.37	0.38	0.68	1	108	10	299.5	3	0	0	77	1008	7
5	11	22	326	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	107	10	298.9	3	0	0	88	1008	7
5	11	22	326	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	298.6	3	0	0	88	1009	7
5	11	22	326	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	298.1	3	0	0	88	1009	3
5	11	22	326	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	298	3	0	0	88	1009	3
5	11	22	326	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	80	10	297.9	3	0	0	94	1009	0
5	11	22	326	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	72	10	297.4	3	0	0	88	1009	3
5	11	23	327	1	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	106	10	297.4	3	0	0	92	1009	0
5	11	23	327	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	73	10	297.2	3	0	0	97	1008	0
5	11	23	327	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	296.9	3	0	0	94	1008	3
5	11	23	327	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	296.9	3	0	0	94	1008	3
5	11	23	327	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	101	10	296.9	3	0	0	94	1008	3
5	11	23	327	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	298	3	0	0	94	1009	7
5	11	23	327	7	-2	0.055	-9	-9	-999	29	7.5	0.37	0.38	0.54	0.9	111	10	301.4	3	0	0	82	1010	0
5	11	23	327	8	53.4	0.221	0.614	0.005	156	239	-18.2	0.37	0.38	0.28	1.4	116	10	303.2	3	0	0	80	1011	0
5	11	23	327	9	85.8	0.254	0.99	0.005	408	295	-17.3	0.37	0.38	0.21	1.6	118	10	304.4	3	0	0	70	1012	0
5	11	23	327	10	97.6	0.246	1.235	0.005	696	281	-13.8	0.37	0.38	0.19	1.5	119	10	305.2	3	0	0	65	1011	6
5	11	23	327	11	75.7	0.229	1.226	0.005	879	252	-14.2	0.37	0.38	0.19	1.4	120	10	305.1	3	0	0	63	1010	8
5	11	23	327	12	36.1	0.17	0.964	0.005	894	162	-12.2	0.655	0.64	0.18	0.8	7	10	303.6	3	0	0	56	1010	10
5	11	23	327	13	21.1	0.186	0.81	0.005	904	185	-27.6	0.655	0.64	0.18	1	352	10	302.8	3	0	0	56	1009	10
5	11	23	327	14	26.5	0.217	0.877	0.005	916	232	-34.5	0.655	0.64	0.18	1.2	342	10	302.8	3	0	0	57	1008	10
5	11	23	327	15	13.4	0.217	0.7	0.005	922	233	-69.2	0.655	0.64	0.19	1.3	350	10	302	3	0	0	58	1008	10
5	11	23	327	16	2.2	-9	-9	-9	923	-999	-99999	0.542	0.56	0.2	0	0	10	301.8	3	0	0	61	1008	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	23	327	17	0.1	0.11	0.137	0.005	922	84	-1203.3	0.37	0.38	0.31	0.9	117	10	300.6	3	0	0	65	1008	10
5	11	23	327	18	-2.4	0.061	-9	-9	-999	35	8.2	0.37	0.38	0.68	1	109	10	299.6	3	0	0	74	1008	7
5	11	23	327	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	299	3	0	0	88	1009	7
5	11	23	327	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	110	10	298.6	3	0	0	85	1009	0
5	11	23	327	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	298.4	3	0	0	94	1010	7
5	11	23	327	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	108	10	297.9	3	0	0	88	1010	3
5	11	23	327	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	76	10	297.6	3	0	0	91	1010	3
5	11	23	327	24	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	87	10	297.4	3	0	0	92	1010	3
5	11	24	328	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	68	10	297.1	3	0	0	93	1009	99
5	11	24	328	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	296.9	3	0	0	94	1009	3
5	11	24	328	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	296.9	3	0	0	94	1009	3
5	11	24	328	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	99	10	297	3	0	0	100	1010	3
5	11	24	328	5	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	296.9	3	0	0	97	1010	3
5	11	24	328	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	297.9	3	0	0	97	1011	7
5	11	24	328	7	-3	0.067	-9	-9	-999	40	9	0.37	0.38	0.55	1.1	88	10	300.4	3	0	0	94	1012	0
5	11	24	328	8	47.4	0.229	0.911	0.005	577	252	-22.9	0.37	0.38	0.28	1.5	99	10	302.5	3	0	0	82	1013	0
5	11	24	328	9	83.1	0.275	1.254	0.005	858	332	-22.7	0.37	0.38	0.21	1.8	106	10	303.9	3	0	0	70	1013	0
5	11	24	328	10	104.4	0.259	1.409	0.005	970	304	-15.1	0.37	0.38	0.19	1.6	121	10	304.9	3	0	0	70	1013	0
5	11	24	328	11	124.6	0.264	1.561	0.005	1104	312	-13.3	0.37	0.38	0.19	1.6	114	10	305.9	3	0	0	59	1012	2
5	11	24	328	12	113.7	0.273	1.569	0.005	1226	328	-16.1	0.37	0.38	0.19	1.7	96	10	305.8	3	0	0	59	1011	7
5	11	24	328	13	93.8	0.245	1.511	0.005	1327	280	-14.2	0.37	0.38	0.19	1.5	110	10	306	3	0	0	56	1010	8
5	11	24	328	14	84.6	0.265	1.493	0.005	1418	314	-19.8	0.37	0.38	0.19	1.7	112	10	305.5	3	0	0	59	1009	8
5	11	24	328	15	28.7	0.23	1.049	0.005	1445	254	-38.1	0.37	0.38	0.19	1.6	108	10	304	3	0	0	61	1009	10
5	11	24	328	16	6.7	0.187	0.645	0.005	1448	186	-87.6	0.37	0.38	0.22	1.4	111	10	302.4	3	0	0	63	1009	10
5	11	24	328	17	0.1	0.158	0.159	0.005	1445	145	-3566.9	0.37	0.38	0.31	1.3	105	10	301	3	0	0	70	1009	10
5	11	24	328	18	-3	0.067	-9	-9	-999	43	9.1	0.37	0.38	0.68	1.1	100	10	299.9	3	0	0	77	1010	7
5	11	24	328	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	96	10	299.2	3	0	0	88	1011	7
5	11	24	328	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	95	10	298.8	3	0	0	85	1012	0
5	11	24	328	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	298.2	3	0	0	79	1012	7
5	11	24	328	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	297.9	3	0	0	85	1012	7
5	11	24	328	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	297.5	3	0	0	79	1012	7
5	11	24	328	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	70	10	297.5	3	0	0	90	1011	3
5	11	25	329	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	297.8	3	0	0	94	1010	3
5	11	25	329	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	297.4	3	0	0	95	1010	3
5	11	25	329	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	296.9	3	0	0	97	1010	3
5	11	25	329	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	92	10	296.5	3	0	0	97	1010	3
5	11	25	329	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	296.4	3	0	0	93	1010	3
5	11	25	329	6	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	58	10	297.4	3	0	0	97	1011	3
5	11	25	329	7	-3.3	0.073	-9	-9	-999	46	10.8	0.655	0.64	0.54	1	67	10	300.5	3	0	0	85	1012	0
5	11	25	329	8	69.9	0.239	0.927	0.005	412	269	-17.7	0.655	0.64	0.27	1.2	62	10	302.5	3	0	0	67	1013	0
5	11	25	329	9	111	0.279	1.353	0.006	807	339	-17.7	0.655	0.64	0.2	1.4	74	10	304	3	0	0	65	1013	0
5	11	25	329	10	161.4	0.277	1.595	0.005	909	336	-11.9	0.655	0.64	0.18	1.3	78	10	305.4	3	0	0	59	1013	0
5	11	25	329	11	133.7	0.311	1.543	0.005	992	400	-20.4	0.655	0.64	0.18	1.6	340	10	304.4	3	0	0	50	1012	8
5	11	25	329	12	169.8	0.373	1.729	0.005	1099	524	-27.6	0.655	0.64	0.18	2	340	10	304.2	3	0	0	52	1011	6
5	11	25	329	13	150.1	0.381	1.707	0.005	1194	541	-33.2	0.655	0.64	0.18	2.1	338	10	304.4	3	0	0	50	1010	7
5	11	25	329	14	41.5	0.252	1.12	0.005	1220	300	-34.9	0.655	0.64	0.18	1.4	359	10	303.8	3	0	0	52	1009	10
5	11	25	329	15	8.7	0.19	0.667	0.005	1220	191	-70.3	0.37	0.38	0.19	1.4	86	10	300.6	3	0	16.26	61	1009	10
5	11	25	329	16	1.1	0.099	0.338	0.005	1218	75	-77.4	0.655	0.64	0.21	0.6	45	10	299.5	3	0	0.25	56	1009	10
5	11	25	329	17	0.1	0.118	0.15	0.005	1219	94	-1495.9	0.655	0.64	0.3	0.8	56	10	299.9	3	0	0	61	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	25	329	18	-3.3	0.073	-9	-9	-999	46	10.9	0.655	0.64	0.67	1	66	10	299.2	3	0	0	74	1010	7
5	11	25	329	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	73	10	298.5	3	0	0	77	1011	7
5	11	25	329	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	73	10	298.4	3	0	0	91	1011	7
5	11	25	329	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	298	3	0	0	94	1012	7
5	11	25	329	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	297.6	3	0	0	88	1011	7
5	11	25	329	23	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	58	10	297.5	3	0	0	91	1010	0
5	11	25	329	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	70	10	297.2	3	0	0	88	1009	7
5	11	26	330	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	297.4	3	0	0	94	1009	7
5	11	26	330	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.5	3	0	0	94	1008	7
5	11	26	330	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	109	10	297.4	3	0	0	94	1008	7
5	11	26	330	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	127	10	297.5	3	0	0	94	1009	7
5	11	26	330	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	111	10	297.5	3	0	0	94	1009	7
5	11	26	330	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	124	10	298.6	3	0	0	90	1010	7
5	11	26	330	7	-3.3	0.073	-9	-9	-999	46	10.8	0.655	0.64	0.55	1	79	10	301.4	3	0	0	88	1010	0
5	11	26	330	8	77.8	0.269	1.004	0.005	469	320	-22.4	0.655	0.64	0.27	1.4	67	10	302.8	3	0	0	74	1010	0
5	11	26	330	9	110.7	0.266	1.391	0.005	877	315	-15.3	0.655	0.64	0.2	1.3	69	10	303.8	3	0	0	63	1011	0
5	11	26	330	10	148.7	0.218	1.598	0.005	990	235	-6.3	0.655	0.64	0.18	0.9	21	10	304.8	3	0	0	59	1010	3
5	11	26	330	11	149.6	0.329	1.66	0.005	1103	433	-21.4	0.655	0.64	0.18	1.7	343	10	304	3	0	0	59	1009	7
5	11	26	330	12	73.5	0.319	1.332	0.005	1157	415	-39.8	0.655	0.64	0.18	1.8	341	10	302.8	3	0	0	54	1009	10
5	11	26	330	13	111.6	0.332	1.568	0.005	1242	441	-29.6	0.655	0.64	0.18	1.8	341	10	303.2	3	0	0	65	1008	9
5	11	26	330	14	79	0.215	1.419	0.005	1302	236	-11.3	0.655	0.64	0.18	1	358	10	303.4	3	0	0	65	1007	9
5	11	26	330	15	22.3	0.221	0.934	0.005	1315	239	-43.7	0.736	0.77	0.18	1.2	142	10	301.1	3	0	0	66	1007	10
5	11	26	330	16	3.7	0.126	0.515	0.005	1317	106	-48.4	0.37	0.38	0.22	0.9	123	10	301	3	0	2.79	63	1007	10
5	11	26	330	17	0.1	0.104	0.154	0.005	1313	77	-1012.7	0.655	0.64	0.3	0.7	79	10	299.2	3	0	0.25	65	1008	3
5	11	26	330	18	-1.8	0.049	-9	-9	-999	25	5.8	0.37	0.38	0.68	0.8	91	10	298.6	3	0	0	74	1008	3
5	11	26	330	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	83	10	298.1	3	0	0	79	1009	3
5	11	26	330	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	93	10	297.5	3	0	0	85	1009	7
5	11	26	330	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	297.4	3	0	0	90	1009	7
5	11	26	330	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	297.1	3	0	0	90	1009	7
5	11	26	330	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	105	10	296.6	3	0	0	93	1009	7
5	11	26	330	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	296.4	3	0	0	97	1009	7
5	11	27	331	1	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	99	10	296	3	0	0	100	1008	7
5	11	27	331	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	118	10	295.8	3	0	0	97	1008	0
5	11	27	331	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	115	10	295.4	3	0	0	93	1008	7
5	11	27	331	4	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	102	10	295.9	3	0	0	93	1008	7
5	11	27	331	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	117	10	295.4	3	0	0	97	1008	7
5	11	27	331	6	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	109	10	295.9	3	0	0	90	1009	3
5	11	27	331	7	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	0.56	0.9	106	10	299.4	3	0	0	100	1010	0
5	11	27	331	8	75.8	0.186	0.806	0.005	249	184	-7.6	0.655	0.64	0.27	0.8	71	10	302.4	3	0	0	85	1010	0
5	11	27	331	9	117.5	0.226	1.195	0.005	523	247	-8.9	0.655	0.64	0.2	1	35	10	303.5	3	0	0	75	1010	0
5	11	27	331	10	88.9	0.259	1.287	0.005	864	304	-17.7	0.655	0.64	0.18	1.3	346	10	302.6	3	0	0	59	1010	9
5	11	27	331	11	165.2	0.359	1.733	0.005	1137	495	-25.2	0.655	0.64	0.18	1.9	339	10	303.1	3	0	0	50	1009	5
5	11	27	331	12	172.9	0.374	1.897	0.006	1422	525	-27.2	0.655	0.64	0.18	2	335	10	303.4	3	0	0	45	1008	6
5	11	27	331	13	156.8	0.409	1.873	0.006	1509	601	-39.1	0.655	0.64	0.18	2.3	341	10	303.6	3	0	0	49	1007	7
5	11	27	331	14	127.8	0.415	1.77	0.006	1560	615	-50.2	0.655	0.64	0.18	2.4	344	10	303.8	3	0	0	44	1007	8
5	11	27	331	15	88.8	0.416	1.579	0.006	1595	618	-72.9	0.655	0.64	0.19	2.5	346	10	303	3	0	0	50	1006	8
5	11	27	331	16	37.2	0.328	1.185	0.006	1609	436	-85.3	0.655	0.64	0.21	2	357	10	302.4	3	0	0	52	1006	9
5	11	27	331	17	0.1	0.191	0.165	0.006	1606	203	-6274.3	0.655	0.64	0.3	1.3	12	10	300.5	3	0	0	59	1007	10
5	11	27	331	18	-2.1	0.059	-9	-9	-999	54	8.8	0.655	0.64	0.67	0.8	51	10	298.9	3	0	0	69	1007	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	27	331	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	63	10	298.4	3	0	0	74	1007	7
5	11	27	331	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	80	10	298.1	3	0	0	79	1008	0
5	11	27	331	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	76	10	297.9	3	0	0	88	1008	7
5	11	27	331	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	297.4	3	0	0	90	1008	7
5	11	27	331	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	93	10	296.9	3	0	0	90	1008	0
5	11	27	331	24	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	73	10	296.8	3	0	0	90	1008	3
5	11	28	332	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	64	10	296.4	3	0	0	90	1007	3
5	11	28	332	2	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	79	10	296	3	0	0	90	1006	3
5	11	28	332	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	295.9	3	0	0	95	1006	3
5	11	28	332	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	295.8	3	0	0	100	1006	3
5	11	28	332	5	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	93	10	296	3	0	0	97	1007	0
5	11	28	332	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	103	10	297.2	3	0	0	93	1007	7
5	11	28	332	7	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	0.56	0.7	90	10	301	3	0	0	97	1008	0
5	11	28	332	8	75.8	0.214	0.907	0.005	354	228	-11.6	0.655	0.64	0.28	1	37	10	302.5	3	0	0	79	1009	0
5	11	28	332	9	124.2	0.309	1.316	0.005	661	395	-21.4	0.655	0.64	0.2	1.6	359	10	303	3	0	0	59	1009	0
5	11	28	332	10	156.6	0.33	1.546	0.005	850	436	-20.7	0.655	0.64	0.18	1.7	342	10	303.5	3	0	0	52	1009	0
5	11	28	332	11	176.1	0.361	1.713	0.005	1028	500	-24.1	0.655	0.64	0.18	1.9	338	10	303.6	3	0	0	50	1009	3
5	11	28	332	12	176.6	0.388	1.809	0.005	1208	555	-29.6	0.655	0.64	0.18	2.1	342	10	303.6	3	0	0	45	1008	5
5	11	28	332	13	162.1	0.41	1.817	0.005	1331	604	-38.2	0.655	0.64	0.18	2.3	339	10	303.4	3	0	0	44	1007	7
5	11	28	332	14	129.3	0.416	1.714	0.005	1400	616	-49.8	0.655	0.64	0.18	2.4	342	10	303.2	3	0	0	46	1006	8
5	11	28	332	15	87	0.403	1.519	0.005	1447	588	-67.3	0.655	0.64	0.19	2.4	346	10	303.1	3	0	0	49	1006	8
5	11	28	332	16	37.1	0.328	1.148	0.005	1465	435	-85.5	0.655	0.64	0.21	2	352	10	302.1	3	0	0	49	1006	9
5	11	28	332	17	0.1	0.25	0.16	0.005	1461	289	-8888	0.655	0.64	0.3	1.7	3	10	300.5	3	0	0	53	1006	10
5	11	28	332	18	-4.4	0.081	-9	-9	-999	85	10.6	0.655	0.64	0.67	1.1	53	10	299.4	3	0	0	69	1007	3
5	11	28	332	19	-2.9	0.061	-9	-9	-999	35	7	0.37	0.38	1	1	88	10	298.2	3	0	0	74	1007	3
5	11	28	332	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	90	10	297.2	3	0	0	82	1008	0
5	11	28	332	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	296.9	3	0	0	84	1008	3
5	11	28	332	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	91	10	296.4	3	0	0	90	1008	3
5	11	28	332	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	82	10	296.2	3	0	0	93	1008	3
5	11	28	332	24	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	97	10	295.8	3	0	0	93	1008	3
5	11	29	333	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	295.9	3	0	0	93	1007	3
5	11	29	333	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	295.5	3	0	0	93	1007	3
5	11	29	333	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	295.1	3	0	0	93	1007	3
5	11	29	333	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	67	10	294.9	3	0	0	93	1007	3
5	11	29	333	5	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	72	10	294.2	3	0	0	97	1007	0
5	11	29	333	6	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	78	10	295.4	3	0	0	100	1008	3
5	11	29	333	7	-2.1	0.055	-9	-9	-999	29	7	0.37	0.38	0.57	0.9	94	10	299.5	3	0	0	93	1009	0
5	11	29	333	8	77	0.186	1.002	0.005	470	185	-7.5	0.655	0.64	0.28	0.8	42	10	302.2	3	0	0	79	1010	0
5	11	29	333	9	118.8	0.254	1.542	0.01	1114	294	-12.4	0.655	0.64	0.2	1.2	355	10	302.9	3	0	0	72	1010	0
5	11	29	333	10	145.6	0.314	1.703	0.011	1223	405	-19.2	0.655	0.64	0.18	1.6	349	10	303.1	3	0	0	63	1010	0
5	11	29	333	11	174.2	0.334	1.832	0.012	1273	444	-19.2	0.655	0.64	0.18	1.7	346	10	303.5	3	0	0	55	1009	3
5	11	29	333	12	57.9	0.185	1.275	0.011	1289	196	-9.8	0.265	0.28	0.14	1.2	326	10	303	3	0	0	52	1009	9
5	11	29	333	13	86.7	0.224	1.468	0.011	1314	244	-11.7	0.265	0.28	0.14	1.5	331	10	303.9	3	0	0	52	1008	7
5	11	29	333	14	100.1	0.342	1.552	0.01	1342	459	-35.7	0.655	0.64	0.18	1.9	342	10	302.5	3	0	0	49	1007	9
5	11	29	333	15	83.5	0.284	1.469	0.01	1366	350	-24.7	0.655	0.64	0.19	1.5	348	10	302.9	3	0	0	55	1007	9
5	11	29	333	16	30.3	0.18	1.05	0.01	1374	180	-17.3	0.655	0.64	0.21	0.9	0	10	302.2	3	0	0	72	1007	10
5	11	29	333	17	0.1	0.076	0.157	0.01	1373	54	-390.1	0.655	0.64	0.3	0.5	48	10	300.9	3	0	0	69	1008	7
5	11	29	333	18	-2	0.055	-9	-9	-999	29	7.5	0.37	0.38	0.67	0.9	134	10	300.4	3	0	0	79	1008	7
5	11	29	333	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	110	10	298.9	3	0	0	79	1008	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	11	29	333	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	82	10	298.1	3	0	0	79	1009	7
5	11	29	333	21	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	81	10	297.4	3	0	0	84	1009	7
5	11	29	333	22	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	95	10	296.6	3	0	0	84	1009	7
5	11	29	333	23	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	84	10	296.4	3	0	0	90	1009	7
5	11	29	333	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	76	10	296.4	3	0	0	93	1009	7
5	11	30	334	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	84	10	296	3	0	0	93	1009	7
5	11	30	334	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	96	10	295.5	3	0	0	97	1008	0
5	11	30	334	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	85	10	295.4	3	0	0	93	1009	7
5	11	30	334	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	295.1	3	0	0	93	1009	7
5	11	30	334	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	294.8	3	0	0	93	1009	7
5	11	30	334	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	295.4	3	0	0	93	1010	7
5	11	30	334	7	-2.1	0.055	-9	-9	-999	29	6.9	0.37	0.38	0.57	0.9	92	10	298.6	3	0	0	93	1011	0
5	11	30	334	8	75	0.156	0.658	0.008	137	141	-4.5	0.655	0.64	0.28	0.6	83	10	301.9	3	0	0	84	1012	0
5	11	30	334	9	80.3	0.135	0.859	0.009	285	114	-2.7	0.37	0.38	0.21	0.6	127	10	303.8	3	0	0	67	1012	0
5	11	30	334	10	144.5	0.231	1.3	0.005	549	256	-7.7	0.655	0.64	0.18	1	343	10	303.8	3	0	0	63	1011	4
5	11	30	334	11	116.3	0.294	1.277	0.005	646	366	-19.6	0.655	0.64	0.18	1.5	341	10	302.4	3	0	0	54	1010	8
5	11	30	334	12	153.2	0.303	1.456	0.005	725	384	-16.4	0.655	0.64	0.18	1.5	344	10	303.6	3	0	0	49	1009	7
5	11	30	334	13	151.5	0.329	1.683	0.006	1135	434	-21.2	0.655	0.64	0.18	1.7	342	10	303.8	3	0	0	42	1008	7
5	11	30	334	14	124.3	0.323	1.605	0.007	1197	422	-24.3	0.655	0.64	0.18	1.7	342	10	303.9	3	0	0	45	1008	8
5	11	30	334	15	80.1	0.309	1.402	0.007	1237	395	-33	0.655	0.64	0.19	1.7	347	10	303.4	3	0	0	59	1007	9
5	11	30	334	16	23.4	0.201	0.933	0.007	1247	213	-31.4	0.655	0.64	0.21	1.1	8	10	302.4	3	0	0	63	1008	10
5	11	30	334	17	0.1	0.147	0.152	0.007	1244	131	-2881.2	0.655	0.64	0.3	1	85	10	300.9	3	0	0	67	1008	10
5	11	30	334	18	-2.9	0.067	-9	-9	-999	42	9.1	0.37	0.38	0.67	1.1	103	10	299.4	3	0	0	79	1009	7
5	11	30	334	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	103	10	298.4	3	0	0	79	1009	7
5	11	30	334	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	298	3	0	0	87	1010	7
5	11	30	334	21	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	98	10	297.4	3	0	0	85	1010	7
5	11	30	334	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	296.9	3	0	0	84	1010	7
5	11	30	334	23	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	72	10	296.4	3	0	0	90	1010	0
5	11	30	334	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	88	10	296	3	0	0	84	1010	7
5	12	1	335	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	295.9	3	0	0	87	1009	7
5	12	1	335	2	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	85	10	295.9	3	0	0	93	1009	3
5	12	1	335	3	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	81	10	295.9	3	0	0	93	1009	3
5	12	1	335	4	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	295.8	3	0	0	93	1009	0
5	12	1	335	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	73	10	295.4	3	0	0	90	1009	3
5	12	1	335	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	48	10	295.6	3	0	0	87	1010	3
5	12	1	335	7	-2.2	0.059	-9	-9	-999	33	8.1	0.655	0.64	0.57	0.8	64	10	298.9	3	0	0	84	1011	0
5	12	1	335	8	70	0.198	0.546	0.009	84	203	-10.1	0.655	0.64	0.28	0.9	60	10	301.8	3	0	0	82	1012	0
5	12	1	335	9	122.6	0.227	0.923	0.009	231	248	-8.6	0.655	0.64	0.2	1	63	10	303.9	3	0	0	70	1012	0
5	12	1	335	10	150.5	0.187	1.2	0.008	415	187	-3.9	0.655	0.64	0.19	0.7	81	10	305.4	3	0	0	61	1011	0
5	12	1	335	11	162.1	0.345	1.398	0.005	608	465	-22.8	0.655	0.64	0.18	1.8	339	10	304.2	3	0	0	59	1010	5
5	12	1	335	12	133.3	0.377	1.416	0.005	767	532	-36.2	0.655	0.64	0.18	2.1	342	10	303.4	3	0	0	47	1009	8
5	12	1	335	13	146.2	0.393	1.742	0.005	1303	567	-37.4	0.655	0.64	0.18	2.2	338	10	303.9	3	0	0	47	1008	7
5	12	1	335	14	88.1	0.272	1.501	0.005	1382	334	-20.6	0.655	0.64	0.18	1.4	347	10	303.5	3	0	0	47	1008	9
5	12	1	335	15	16.9	0.166	0.869	0.005	1395	161	-24.5	0.37	0.38	0.19	1.1	127	10	302.5	3	0	0	59	1008	10
5	12	1	335	16	13.9	0.174	0.817	0.005	1407	167	-34.2	0.37	0.38	0.22	1.2	112	10	302.5	3	0	0	65	1008	10
5	12	1	335	17	0.1	0.133	0.158	0.005	1402	112	-2112.4	0.655	0.64	0.3	0.9	83	10	300.8	3	0	0	76	1009	10
5	12	1	335	18	-2.1	0.059	-9	-9	-999	35	8.9	0.655	0.64	0.66	0.8	58	10	299	3	0	0	88	1009	7
5	12	1	335	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	68	10	298.8	3	0	0	88	1009	7
5	12	1	335	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	72	10	298.5	3	0	0	91	1010	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	1	335	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298	3	0	0	88	1010	7
5	12	1	335	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297.8	3	0	0	88	1010	7
5	12	1	335	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	297.4	3	0	0	94	1010	7
5	12	1	335	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	73	10	297.4	3	0	0	94	1010	7
5	12	2	336	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	297.4	3	0	0	100	1010	7
5	12	2	336	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	69	10	297	3	0	0	93	1009	7
5	12	2	336	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	67	10	296.6	3	0	0	100	1009	7
5	12	2	336	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	296.1	3	0	0	90	1009	7
5	12	2	336	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	296.2	3	0	0	93	1010	7
5	12	2	336	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	120	10	296.4	3	0	0	97	1010	7
5	12	2	336	7	-2.2	0.055	-9	-9	-999	29	6.8	0.37	0.38	0.58	0.9	116	10	297.5	3	0	0	97	1012	0
5	12	2	336	8	19.6	0.169	0.384	0.006	105	160	-22.2	0.37	0.38	0.29	1.1	106	10	299	3	0	0	90	1013	8
5	12	2	336	9	36.4	0.191	0.577	0.005	190	192	-17.3	0.37	0.38	0.21	1.2	86	10	300.9	3	0	0	82	1013	9
5	12	2	336	10	105	0.25	1.079	0.005	432	288	-13.5	0.655	0.64	0.19	1.2	84	10	303	3	0	0	79	1013	8
5	12	2	336	11	58.4	0.266	0.957	0.005	541	316	-29.2	0.37	0.38	0.19	1.8	114	10	302.6	3	0	0	82	1012	9
5	12	2	336	12	49.8	0.186	0.957	0.005	635	186	-11.7	0.37	0.38	0.19	1.1	105	10	302.6	3	0	0	79	1012	10
5	12	2	336	13	58.4	0.266	1.064	0.005	745	316	-29.2	0.37	0.38	0.19	1.8	130	10	302.2	3	0	0	74	1011	9
5	12	2	336	14	81.2	0.32	1.247	0.005	861	417	-36.5	0.736	0.77	0.18	1.7	142	10	302.4	3	0	0	80	1010	9
5	12	2	336	15	37.8	0.235	0.985	0.005	910	265	-30.9	0.37	0.38	0.19	1.6	118	10	302	3	0	0	75	1009	10
5	12	2	336	16	18.2	0.189	0.778	0.005	932	190	-33.5	0.37	0.38	0.22	1.3	118	10	301.1	3	0	0	74	1009	10
5	12	2	336	17	0.5	0.137	0.232	0.005	930	116	-473.1	0.37	0.38	0.31	1.1	100	10	299.9	3	0	0	79	1009	10
5	12	2	336	18	-1.5	0.049	-9	-9	-999	29	6.7	0.37	0.38	0.66	0.8	105	10	299	3	0	0	82	1010	7
5	12	2	336	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	116	10	298.4	3	0	0	88	1010	7
5	12	2	336	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	297.9	3	0	0	91	1011	7
5	12	2	336	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	297.8	3	0	0	94	1012	3
5	12	2	336	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	108	10	297.4	3	0	0	94	1012	3
5	12	2	336	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	72	10	297.2	3	0	0	97	1011	0
5	12	2	336	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	51	10	296.9	3	0	0	97	1011	3
5	12	3	337	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	296.9	3	0	0	100	1010	3
5	12	3	337	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	79	10	296.9	3	0	0	97	1010	0
5	12	3	337	3	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	103	10	296.8	3	0	0	97	1010	3
5	12	3	337	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	296.5	3	0	0	90	1010	3
5	12	3	337	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	296.2	3	0	0	93	1010	7
5	12	3	337	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	297.2	3	0	0	97	1011	3
5	12	3	337	7	-2.3	0.059	-9	-9	-999	33	8.1	0.655	0.64	0.58	0.8	76	10	299.5	3	0	0	90	1012	0
5	12	3	337	8	68.4	0.252	0.718	0.005	195	291	-21.1	0.655	0.64	0.28	1.3	72	10	302.4	3	0	0	85	1013	0
5	12	3	337	9	97.9	0.302	1.088	0.006	475	382	-25.4	0.655	0.64	0.21	1.6	77	10	303.5	3	0	0	70	1013	0
5	12	3	337	10	74.5	0.272	1.124	0.005	689	327	-24.4	0.37	0.38	0.19	1.8	94	10	303.6	3	0	0	65	1013	8
5	12	3	337	11	82.6	0.275	1.241	0.005	836	332	-22.8	0.37	0.38	0.19	1.8	116	10	303.8	3	0	0	65	1012	8
5	12	3	337	12	15.6	0.297	0.714	0.005	842	373	-152.1	0.736	0.77	0.18	1.8	162	10	299.5	3	0	1.27	63	1012	10
5	12	3	337	13	4.4	0.098	0.47	0.005	843	116	-19.2	0.655	0.64	0.18	0.5	34	10	298.4	3	0	0	65	1011	10
5	12	3	337	14	17.4	0.143	0.744	0.005	852	125	-15.3	0.655	0.64	0.18	0.7	67	10	299.1	3	0	0	85	1010	10
5	12	3	337	15	13.9	0.229	0.692	0.005	858	251	-77.4	0.37	0.38	0.19	1.7	90	10	297.6	3	0	2.03	82	1010	10
5	12	3	337	16	8.3	0.146	0.583	0.005	862	130	-33.6	0.37	0.38	0.22	1	92	10	296.8	3	0	0.25	100	1009	10
5	12	3	337	17	0.1	0.122	0.134	0.005	862	98	-1641.4	0.37	0.38	0.31	1	110	10	296.9	3	0	0	94	1009	10
5	12	3	337	18	-1.6	0.051	-9	-9	-999	28	7.7	0.655	0.64	0.65	0.7	81	10	296.9	3	0	0	94	1010	7
5	12	3	337	19	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	296.9	3	0	0	100	1011	7
5	12	3	337	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	117	10	296.9	3	0	0	97	1012	7
5	12	3	337	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	297	3	0	0	100	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	3	337	22	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	78	10	297.2	3	0	0	100	1012	7
5	12	3	337	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	73	10	296.9	3	0	0	97	1012	7
5	12	3	337	24	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	71	10	296.9	3	0	1.02	100	1011	7
5	12	4	338	1	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	86	10	296.9	3	0	0	100	1010	0
5	12	4	338	2	-2.2	0.066	-9	-9	-999	39	11.6	0.655	0.64	1	0.9	85	10	296.6	3	0	0.25	97	1010	10
5	12	4	338	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	296.5	3	0	0	100	1010	7
5	12	4	338	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	61	10	296.5	3	0	0	100	1010	7
5	12	4	338	5	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	51	10	296.8	3	0	0	97	1010	10
5	12	4	338	6	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	56	10	296.8	3	0	0.51	94	1011	7
5	12	4	338	7	-2.9	0.066	-9	-9	-999	39	8.9	0.655	0.64	0.58	0.9	81	10	297.2	3	0	0	94	1012	0
5	12	4	338	8	17.1	0.156	0.421	0.005	158	142	-20.1	0.655	0.64	0.28	0.8	83	10	298.4	3	0	0	97	1013	9
5	12	4	338	9	37.5	0.142	0.711	0.005	346	124	-6.9	0.655	0.64	0.21	0.6	61	10	299.4	3	0	0	94	1013	9
5	12	4	338	10	20.3	0.191	0.631	0.005	447	192	-31	0.37	0.38	0.19	1.3	130	10	298.1	3	0	10.92	94	1013	10
5	12	4	338	11	74.9	0.2	1.049	0.005	557	206	-9.7	0.655	0.64	0.18	0.9	65	10	299	3	0	0.51	97	1012	9
5	12	4	338	12	31.1	0.143	0.795	0.005	581	125	-8.4	0.37	0.38	0.19	0.8	97	10	299.8	3	0	0.25	94	1012	10
5	12	4	338	13	6.8	0.143	0.479	0.005	586	125	-39.3	0.37	0.38	0.19	1	108	10	298.2	3	0	18.8	94	1011	10
5	12	4	338	14	7.7	0.177	0.501	0.005	592	171	-65.4	0.37	0.38	0.19	1.3	126	10	297.2	3	0	3.56	97	1010	10
5	12	4	338	15	7.2	0.182	0.492	0.005	597	179	-76.1	0.655	0.64	0.19	1.1	82	10	296.9	3	0	3.05	100	1010	10
5	12	4	338	16	0.1	0.206	0.119	0.005	597	215	-7852.5	0.655	0.64	0.21	1.4	67	10	296.5	3	0	3.81	100	1010	10
5	12	4	338	17	0.1	0.191	0.119	0.005	597	192	-6293.2	0.655	0.64	0.3	1.3	73	10	296.5	3	0	0.25	93	1010	10
5	12	4	338	18	-3.9	0.088	-9	-9	-999	65	15.9	0.655	0.64	0.65	1.2	70	10	296.4	3	0	0.25	100	1010	10
5	12	4	338	19	-2.8	0.073	-9	-9	-999	46	12.9	0.655	0.64	1	1	69	10	296.6	3	0	0	100	1010	10
5	12	4	338	20	-1.3	0.049	-9	-9	-999	25	7.7	0.37	0.38	1	0.8	88	10	296.5	3	0	0	97	1011	10
5	12	4	338	21	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	1	0.7	83	10	296.6	3	0	0	100	1012	10
5	12	4	338	22	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	79	10	296.6	3	0	0	100	1011	10
5	12	4	338	23	-0.7	0.036	-9	-9	-999	16	5.8	0.37	0.38	1	0.6	95	10	296.6	3	0	0	100	1011	10
5	12	4	338	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.2	3	0	0	100	1010	7
5	12	5	339	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	49	10	296	3	0	0	100	1010	7
5	12	5	339	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	90	10	296.2	3	0	0	97	1010	0
5	12	5	339	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	296.4	3	0	0	100	1009	7
5	12	5	339	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	296.4	3	0	0	100	1010	7
5	12	5	339	5	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	81	10	296.4	3	0	0	100	1010	0
5	12	5	339	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	296.2	3	0	0	100	1011	7
5	12	5	339	7	-1.3	0.042	-9	-9	-999	20	5.2	0.37	0.38	0.6	0.7	96	10	298.4	3	0	0	100	1012	0
5	12	5	339	8	45.5	0.202	0.465	0.007	80	209	-16.4	0.655	0.64	0.29	1	78	10	301.4	3	0	0	94	1013	0
5	12	5	339	9	93.8	0.274	0.861	0.007	245	330	-19.8	0.655	0.64	0.21	1.4	72	10	302.9	3	0	0	79	1013	0
5	12	5	339	10	97.6	0.28	1.042	0.007	419	340	-20.3	0.37	0.38	0.19	1.8	99	10	304	3	0	0	75	1013	0
5	12	5	339	11	105.3	0.271	1.209	0.006	607	324	-17	0.37	0.38	0.19	1.7	101	10	304.5	3	0	0	72	1012	6
5	12	5	339	12	67.7	0.303	1.108	0.005	725	383	-37	0.37	0.38	0.19	2.1	113	10	303.5	3	0	0	66	1011	9
5	12	5	339	13	68.6	0.252	1.139	0.005	778	292	-21	0.655	0.64	0.18	1.3	84	10	300.4	3	0	0	77	1010	10
5	12	5	339	14	43.4	0.214	0.989	0.005	802	228	-20.4	0.655	0.64	0.18	1.1	78	10	300.8	3	0	0	82	1009	10
5	12	5	339	15	25.2	0.19	0.83	0.005	815	190	-24.4	0.655	0.64	0.19	1	71	10	300.9	3	0	0	74	1009	10
5	12	5	339	16	6.7	0.156	0.534	0.005	818	141	-50.6	0.655	0.64	0.21	0.9	71	10	300.2	3	0	0	79	1009	10
5	12	5	339	17	0.1	0.11	0.132	0.005	818	84	-1205.3	0.37	0.38	0.31	0.9	102	10	299.8	3	0	0	79	1009	10
5	12	5	339	18	-2	0.059	-9	-9	-999	33	9	0.655	0.64	0.65	0.8	83	10	299.1	3	0	0	82	1010	7
5	12	5	339	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	298.8	3	0	0	88	1010	7
5	12	5	339	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	74	10	298.4	3	0	0	85	1010	7
5	12	5	339	21	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	71	10	298	3	0	0	88	1011	7
5	12	5	339	22	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	80	10	297.9	3	0	0	94	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	5	339	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	70	10	297.9	3	0	0	94	1010	7
5	12	5	339	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	297.6	3	0	0	94	1010	7
5	12	6	340	1	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	91	10	297.4	3	0	0	95	1009	0
5	12	6	340	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	297.4	3	0	0	97	1008	7
5	12	6	340	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	59	10	296.9	3	0	0.76	94	1008	7
5	12	6	340	4	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	78	10	297.4	3	0	0	94	1008	7
5	12	6	340	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	297.2	3	0	0	91	1009	7
5	12	6	340	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	297.2	3	0	0	88	1009	7
5	12	6	340	7	-5.3	0.085	-9	-9	-999	57	10.3	0.37	0.38	0.6	1.4	108	10	298.2	3	0	0	88	1010	0
5	12	6	340	8	6.3	0.208	0.271	0.005	114	218	-129.5	0.37	0.38	0.29	1.6	131	10	297.5	3	0	0.25	85	1012	10
5	12	6	340	9	11	0.193	0.381	0.005	180	194	-58.5	0.37	0.38	0.21	1.4	118	10	297.5	3	0	6.1	79	1012	10
5	12	6	340	10	49.1	0.197	0.71	0.005	263	201	-14	0.37	0.38	0.19	1.2	96	10	298.9	3	0	0.25	85	1012	9
5	12	6	340	11	80.4	0.241	0.963	0.005	400	273	-15.8	0.37	0.38	0.19	1.5	98	10	301.4	3	0	0	74	1010	8
5	12	6	340	12	83.5	0.242	1.08	0.005	543	274	-15.3	0.37	0.38	0.19	1.5	100	10	302.6	3	0	0	75	1009	8
5	12	6	340	13	65	0.269	1.058	0.005	655	321	-26.9	0.37	0.38	0.19	1.8	96	10	303.1	3	0	0	65	1008	9
5	12	6	340	14	63.7	0.258	1.106	0.005	765	301	-24.1	0.37	0.38	0.19	1.7	98	10	303.4	3	0	0	67	1008	9
5	12	6	340	15	37.9	0.224	0.98	0.005	893	245	-26.8	0.37	0.38	0.19	1.5	99	10	302.1	3	0	0	70	1008	10
5	12	6	340	16	26.9	0.218	0.879	0.005	908	234	-34.5	0.37	0.38	0.22	1.5	106	10	302	3	0	0	65	1008	9
5	12	6	340	17	0.1	0.133	0.136	0.005	907	113	-2111	0.655	0.64	0.3	0.9	76	10	300.2	3	0	0	70	1008	10
5	12	6	340	18	-2.9	0.066	-9	-9	-999	40	8.8	0.655	0.64	0.64	0.9	76	10	299.1	3	0	0	77	1008	3
5	12	6	340	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	109	10	298	3	0	0	79	1009	3
5	12	6	340	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	297.2	3	0	0	79	1009	3
5	12	6	340	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	75	10	297	3	0	0	85	1010	3
5	12	6	340	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	296.6	3	0	0	90	1009	3
5	12	6	340	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	296.4	3	0	0	97	1009	3
5	12	6	340	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	76	10	296.2	3	0	0	97	1009	3
5	12	7	341	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	113	10	297	3	0	0	97	1008	3
5	12	7	341	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	66	10	296.9	3	0	0	97	1008	3
5	12	7	341	3	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	90	10	296.8	3	0	0	94	1008	3
5	12	7	341	4	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	77	10	296.4	3	0	0	94	1008	3
5	12	7	341	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	121	10	296.4	3	0	0	100	1009	7
5	12	7	341	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	131	10	296.9	3	0	0	100	1009	3
5	12	7	341	7	-0.9	0.037	-9	-9	-999	16	4.9	0.655	0.64	0.6	0.5	74	10	299.8	3	0	0	94	1010	0
5	12	7	341	8	16.8	0.182	0.474	0.005	228	179	-32.4	0.655	0.64	0.29	1	85	10	298	3	0	3.81	94	1011	9
5	12	7	341	9	94.3	0.206	1.215	0.006	687	214	-8.3	0.655	0.64	0.21	0.9	52	10	300.8	3	0	0	94	1012	0
5	12	7	341	10	138.5	0.259	1.43	0.006	761	302	-11.2	0.655	0.64	0.19	1.2	39	10	302.9	3	0	0	75	1011	5
5	12	7	341	11	63.5	0.237	1.119	0.006	795	265	-18.8	0.655	0.64	0.18	1.2	82	10	301.4	3	0	7.11	68	1011	10
5	12	7	341	12	27.5	0.23	0.851	0.006	807	254	-40	0.655	0.64	0.18	1.3	360	10	297.6	3	0	4.57	65	1010	10
5	12	7	341	13	60.8	0.236	1.124	0.006	841	263	-19.3	0.655	0.64	0.18	1.2	15	10	299.4	3	0	0.25	70	1009	10
5	12	7	341	14	46.7	0.173	1.04	0.006	868	167	-10.1	0.37	0.38	0.19	1	90	10	301.5	3	0	0	70	1008	9
5	12	7	341	15	83.3	0.31	1.284	0.006	913	397	-32.2	0.655	0.64	0.19	1.7	77	10	302.8	3	0	0	70	1008	9
5	12	7	341	16	28	0.262	0.898	0.006	928	309	-57.7	0.37	0.38	0.22	1.9	86	10	301.9	3	0	0	70	1008	9
5	12	7	341	17	0.1	0.191	0.137	0.006	926	194	-6289	0.655	0.64	0.3	1.3	82	10	299.9	3	0	0	72	1009	10
5	12	7	341	18	-2.6	0.066	-9	-9	-999	52	10.2	0.655	0.64	0.64	0.9	76	10	298.8	3	0	0	74	1010	7
5	12	7	341	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	79	10	297.9	3	0	0	88	1010	7
5	12	7	341	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	83	10	297.5	3	0	0	85	1011	0
5	12	7	341	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	297.1	3	0	0	85	1011	3
5	12	7	341	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	67	10	296.9	3	0	0	85	1011	3
5	12	7	341	23	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	79	10	297.1	3	0	0	90	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	7	341	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	97	10	296.8	3	0	0	94	1010	3
5	12	8	342	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	296.8	3	0	0	94	1010	7
5	12	8	342	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	296.6	3	0	0	97	1009	7
5	12	8	342	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	296.5	3	0	0.25	95	1009	7
5	12	8	342	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	296.8	3	0	0.51	94	1009	3
5	12	8	342	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	296.4	3	0	0	97	1010	7
5	12	8	342	6	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	63	10	296.8	3	0	0.51	94	1010	7
5	12	8	342	7	-4	0.073	-9	-9	-999	45	8.7	0.37	0.38	0.61	1.2	86	10	297.4	3	0	0	100	1011	0
5	12	8	342	8	27.5	0.257	0.532	0.005	197	299	-55.4	0.655	0.64	0.29	1.5	75	10	298.4	3	0	0	85	1012	8
5	12	8	342	9	69.3	0.318	0.876	0.005	350	412	-41.7	0.655	0.64	0.21	1.8	79	10	300.8	3	0	0.76	77	1012	8
5	12	8	342	10	92.5	0.378	1.123	0.005	553	535	-52.8	0.655	0.64	0.19	2.2	79	10	299.9	3	0	2.03	94	1012	8
5	12	8	342	11	71.7	0.332	1.122	0.005	711	440	-45.9	0.655	0.64	0.18	1.9	78	10	299.9	3	0	1.27	88	1012	9
5	12	8	342	12	62.6	0.315	1.126	0.005	823	406	-44.9	0.655	0.64	0.18	1.8	77	10	299.2	3	0	0	88	1011	10
5	12	8	342	13	90.5	0.313	1.321	0.005	918	402	-30.4	0.655	0.64	0.18	1.7	82	10	300.9	3	0	0	77	1009	9
5	12	8	342	14	69.3	0.331	1.238	0.005	985	438	-47.1	0.655	0.64	0.18	1.9	79	10	302.2	3	0	0	72	1009	9
5	12	8	342	15	21.4	0.246	0.842	0.005	1003	284	-62.7	0.37	0.38	0.19	1.8	92	10	301.4	3	0	0	70	1009	10
5	12	8	342	16	13.1	0.25	0.717	0.005	1014	287	-107.4	0.37	0.38	0.22	1.9	87	10	300.2	3	0	0	74	1009	10
5	12	8	342	17	0.1	0.162	0.141	0.005	1011	152	-3828.2	0.655	0.64	0.3	1.1	73	10	298.9	3	0	0	88	1010	10
5	12	8	342	18	-5.2	0.088	-9	-9	-999	62	11.8	0.655	0.64	0.64	1.2	62	10	297.8	3	0	0.25	88	1010	3
5	12	8	342	19	-8.6	0.11	-9	-9	-999	84	14	0.655	0.64	1	1.5	71	10	297.1	3	0	0.51	94	1012	3
5	12	8	342	20	-9.7	0.181	-9	-9	-999	176	54.8	0.37	0.38	1	1.9	92	10	296.8	3	0	3.05	97	1012	10
5	12	8	342	21	-6.5	0.097	-9	-9	-999	72	12.6	0.37	0.38	1	1.6	96	10	296.9	3	0	2.79	94	1012	7
5	12	8	342	22	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	60	10	296.9	3	0	0.25	94	1012	7
5	12	8	342	23	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	68	10	297.2	3	0	0	97	1012	7
5	12	8	342	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	69	10	296.9	3	0	0	94	1011	7
5	12	9	343	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	71	10	296.9	3	0	0	88	1010	7
5	12	9	343	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	297	3	0	0	85	1010	7
5	12	9	343	3	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	78	10	296.9	3	0	0	85	1010	3
5	12	9	343	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	70	10	296.9	3	0	0	85	1010	3
5	12	9	343	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	296.6	3	0	0	79	1011	7
5	12	9	343	6	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	98	10	297.6	3	0	0	85	1012	3
5	12	9	343	7	-3	0.066	-9	-9	-999	39	8.7	0.655	0.64	0.61	0.9	76	10	299	3	0	0	79	1012	0
5	12	9	343	8	28.3	0.205	0.617	0.005	299	214	-27.6	0.655	0.64	0.29	1.1	75	10	300.1	3	0	0	72	1013	8
5	12	9	343	9	53.3	0.297	0.936	0.006	555	372	-44.3	0.37	0.38	0.22	2.1	87	10	302	3	0	0	67	1013	7
5	12	9	343	10	97.5	0.356	1.316	0.007	846	488	-41.7	0.37	0.38	0.19	2.5	95	10	303.4	3	0	0	63	1013	3
5	12	9	343	11	160.2	0.422	1.589	0.006	906	631	-42.5	0.655	0.64	0.18	2.4	84	10	304.1	3	0	0	61	1012	5
5	12	9	343	12	73.9	0.327	1.241	0.006	933	434	-42.5	0.37	0.38	0.19	2.3	102	10	303.4	3	0	0	63	1011	9
5	12	9	343	13	76	0.295	1.266	0.005	961	368	-30.3	0.37	0.38	0.19	2	109	10	302.8	3	0	0	63	1010	8
5	12	9	343	14	54.1	0.308	1.138	0.005	981	393	-48.7	0.37	0.38	0.19	2.2	93	10	301.4	3	0	0	65	1010	9
5	12	9	343	15	66.6	0.343	1.229	0.005	1006	462	-54.5	0.655	0.64	0.19	2	81	10	301.5	3	0	0.76	79	1009	9
5	12	9	343	16	12.7	0.238	0.709	0.005	1009	272	-95.9	0.37	0.38	0.22	1.8	89	10	299.2	3	0	1.27	70	1010	10
5	12	9	343	17	0.1	0.134	0.141	0.005	1008	118	-2175.3	0.37	0.38	0.31	1.1	91	10	298.1	3	0	0	77	1010	10
5	12	9	343	18	-1.5	0.051	-9	-9	-999	31	7.9	0.655	0.64	0.64	0.7	66	10	297.8	3	0	0	77	1010	7
5	12	9	343	19	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	68	10	297.5	3	0	0	82	1011	3
5	12	9	343	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	66	10	297.4	3	0	0	85	1012	7
5	12	9	343	21	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	76	10	297.2	3	0	0	88	1012	3
5	12	9	343	22	-5.5	0.088	-9	-9	-999	60	11.2	0.655	0.64	1	1.2	84	10	297.5	3	0	0	88	1012	3
5	12	9	343	23	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	84	10	297.4	3	0	0	88	1011	7
5	12	9	343	24	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	81	10	297.2	3	0	0	88	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	10	344	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	297.1	3	0	0	82	1010	3
5	12	10	344	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	297	3	0	0	85	1010	7
5	12	10	344	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	62	10	296.9	3	0	0	88	1009	3
5	12	10	344	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	296.8	3	0	0	88	1010	3
5	12	10	344	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	49	10	296.5	3	0	0	85	1010	3
5	12	10	344	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	58	10	296.9	3	0	0	88	1011	3
5	12	10	344	7	-3.7	0.073	-9	-9	-999	46	9.7	0.655	0.64	0.61	1	82	10	300.4	3	0	0	88	1012	0
5	12	10	344	8	39.8	0.28	0.67	0.005	272	340	-49.6	0.37	0.38	0.3	2	94	10	301.9	3	0	0	85	1013	0
5	12	10	344	9	86.6	0.342	1.097	0.005	550	459	-41.6	0.37	0.38	0.22	2.4	100	10	302.9	3	0	0	75	1013	0
5	12	10	344	10	97.2	0.366	1.301	0.005	819	510	-45.7	0.37	0.38	0.19	2.6	104	10	303.4	3	0	0	70	1013	0
5	12	10	344	11	109.9	0.337	1.437	0.006	975	451	-31.5	0.37	0.38	0.19	2.3	94	10	303.9	3	0	0	70	1012	5
5	12	10	344	12	117.7	0.361	1.55	0.007	1142	500	-36.2	0.37	0.38	0.19	2.5	93	10	303.6	3	0	0	67	1011	6
5	12	10	344	13	107.4	0.391	1.525	0.007	1192	562	-50.2	0.37	0.38	0.19	2.8	91	10	302.9	3	0	0	70	1010	7
5	12	10	344	14	77.2	0.328	1.38	0.007	1227	434	-41.1	0.37	0.38	0.19	2.3	92	10	303	3	0	0	67	1010	8
5	12	10	344	15	54.3	0.319	1.235	0.007	1252	415	-53.9	0.37	0.38	0.19	2.3	94	10	302.9	3	0	0.25	67	1009	9
5	12	10	344	16	11.2	0.215	0.731	0.007	1253	233	-79.2	0.655	0.64	0.21	1.3	77	10	298.9	3	0	0.51	70	1009	10
5	12	10	344	17	0.1	0.191	0.152	0.007	1253	192	-6286.9	0.655	0.64	0.3	1.3	71	10	299.2	3	0	0	70	1009	10
5	12	10	344	18	-4	0.079	-9	-9	-999	58	11.2	0.37	0.38	0.64	1.3	88	10	298.6	3	0	0	74	1009	7
5	12	10	344	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	86	10	298	3	0	0	79	1010	7
5	12	10	344	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	97	10	297.6	3	0	0	82	1011	0
5	12	10	344	21	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	92	10	297.4	3	0	0	85	1011	7
5	12	10	344	22	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	89	10	297.4	3	0	0	88	1011	7
5	12	10	344	23	-4.7	0.081	-9	-9	-999	53	10	0.655	0.64	1	1.1	85	10	297.4	3	0	0	88	1010	0
5	12	10	344	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	1	77	10	297.2	3	0	0	88	1010	99
5	12	11	345	1	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	66	10	296.9	3	0	0	89	1009	99
5	12	11	345	2	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	76	10	297.2	3	0	0	90	1008	7
5	12	11	345	3	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	104	10	297.4	3	0	0	85	1009	7
5	12	11	345	4	-5.7	0.085	-9	-9	-999	57	9.6	0.37	0.38	1	1.4	92	10	297	3	0	0.25	88	1009	0
5	12	11	345	5	-6.6	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	85	10	296.8	3	0	0.25	97	1010	7
5	12	11	345	6	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	65	10	296.8	3	0	0.25	98	1010	7
5	12	11	345	7	-3.7	0.073	-9	-9	-999	46	9.6	0.655	0.64	0.62	1	54	10	297.8	3	0	0	100	1011	0
5	12	11	345	8	26.1	0.19	0.312	0.005	42	191	-23.9	0.655	0.64	0.29	1	81	10	299.1	3	0	0	85	1012	8
5	12	11	345	9	75.6	0.228	0.701	0.005	164	251	-14.2	0.655	0.64	0.21	1.1	65	10	299.9	3	0	0.51	82	1012	7
5	12	11	345	10	136.4	0.325	1.136	0.005	388	427	-22.8	0.655	0.64	0.19	1.7	68	10	302.8	3	0	0	82	1012	4
5	12	11	345	11	127.4	0.362	1.282	0.005	597	501	-33.6	0.655	0.64	0.18	2	70	10	303.2	3	0	0	63	1011	7
5	12	11	345	12	98.8	0.328	1.277	0.005	759	433	-32.3	0.655	0.64	0.18	1.8	74	10	303	3	0	0	63	1010	9
5	12	11	345	13	117.1	0.36	1.458	0.005	953	496	-35.7	0.655	0.64	0.18	2	75	10	303.5	3	0	0	59	1009	8
5	12	11	345	14	60.5	0.327	1.208	0.005	1048	431	-52.1	0.655	0.64	0.18	1.9	79	10	302.4	3	0	0	59	1008	10
5	12	11	345	15	36.2	0.249	1.036	0.005	1104	289	-38.5	0.655	0.64	0.19	1.4	64	10	301.4	3	0	0	63	1008	10
5	12	11	345	16	17.7	0.248	0.822	0.005	1132	284	-77.7	0.655	0.64	0.21	1.5	74	10	301.2	3	0	0	67	1008	10
5	12	11	345	17	0.1	0.158	0.147	0.005	1127	147	-3563.3	0.37	0.38	0.3	1.3	86	10	300	3	0	0	72	1008	10
5	12	11	345	18	-2.7	0.061	-9	-9	-999	40	7.5	0.37	0.38	0.63	1	92	10	298.9	3	0	0	74	1009	3
5	12	11	345	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	84	10	298.1	3	0	0	79	1009	3
5	12	11	345	20	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	76	10	297.4	3	0	0	88	1010	0
5	12	11	345	21	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	98	10	297.4	3	0	0	88	1010	7
5	12	11	345	22	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	100	10	296.9	3	0	0	85	1011	7
5	12	11	345	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	63	10	296.5	3	0	0	93	1011	0
5	12	11	345	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	296.4	3	0	0	90	1010	3
5	12	12	346	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	66	10	296	3	0	0	97	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	12	346	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	295.8	3	0	0	90	1009	3
5	12	12	346	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	57	10	295.4	3	0	0	93	1009	3
5	12	12	346	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	66	10	295.1	3	0	0	100	1009	3
5	12	12	346	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	61	10	294.9	3	0	0	97	1010	3
5	12	12	346	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	295.9	3	0	0	100	1010	3
5	12	12	346	7	-1.8	0.051	-9	-9	-999	27	6.7	0.655	0.64	0.62	0.7	64	10	299.5	3	0	0	93	1012	0
5	12	12	346	8	68	0.211	0.678	0.005	165	223	-12.5	0.655	0.64	0.3	1	51	10	301.9	3	0	0	79	1012	0
5	12	12	346	9	114.5	0.225	1.121	0.005	445	246	-9	0.655	0.64	0.21	1	58	10	303.4	3	0	0	70	1012	0
5	12	12	346	10	133.7	0.271	1.419	0.005	772	325	-13.5	0.655	0.64	0.19	1.3	78	10	304	3	0	0	55	1012	5
5	12	12	346	11	116.9	0.281	1.524	0.009	1094	342	-17.1	0.655	0.64	0.18	1.4	66	10	303.8	3	0	0	61	1011	8
5	12	12	346	12	120.8	0.263	1.594	0.008	1209	311	-13.6	0.37	0.38	0.19	1.6	99	10	305.2	3	0	0	52	1010	5
5	12	12	346	13	47.8	0.208	1.176	0.008	1226	218	-16.9	0.37	0.38	0.19	1.3	90	10	303.9	3	0	0	56	1009	10
5	12	12	346	14	75.1	0.262	1.375	0.008	1245	308	-21.5	0.37	0.38	0.19	1.7	102	10	304	3	0	0	55	1008	8
5	12	12	346	15	56	0.244	1.251	0.008	1256	277	-23.3	0.37	0.38	0.19	1.6	99	10	304.2	3	0	0	55	1008	9
5	12	12	346	16	12.6	0.227	0.762	0.007	1258	249	-83.5	0.37	0.38	0.22	1.7	98	10	302.2	3	0	0	63	1008	10
5	12	12	346	17	0.1	0.17	0.152	0.008	1257	162	-4440.4	0.37	0.38	0.3	1.4	103	10	300.5	3	0	0	70	1008	10
5	12	12	346	18	-2.7	0.061	-9	-9	-999	43	7.5	0.37	0.38	0.63	1	92	10	299.2	3	0	0	77	1008	3
5	12	12	346	19	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	90	10	298.4	3	0	0	82	1009	3
5	12	12	346	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	94	10	297.9	3	0	0	85	1009	0
5	12	12	346	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	83	10	297.5	3	0	0	82	1010	3
5	12	12	346	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	116	10	297.4	3	0	0	82	1010	3
5	12	12	346	23	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	99	10	297.1	3	0	0	88	1010	3
5	12	12	346	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	296.8	3	0	0	88	1009	3
5	12	13	347	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	67	10	296.4	3	0	0	85	1009	3
5	12	13	347	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	59	10	296.1	3	0	0	87	1008	0
5	12	13	347	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	70	10	295.9	3	0	0	85	1008	3
5	12	13	347	4	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	80	10	296.2	3	0	0	97	1008	3
5	12	13	347	5	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	296.6	3	0	0	93	1009	3
5	12	13	347	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	297	3	0	0	93	1009	3
5	12	13	347	7	-1.8	0.049	-9	-9	-999	25	5.8	0.37	0.38	0.64	0.8	86	10	300.1	3	0	0	90	1010	0
5	12	13	347	8	64.8	0.25	0.824	0.005	311	288	-21.8	0.655	0.64	0.3	1.3	85	10	301.9	3	0	0	77	1011	0
5	12	13	347	9	78.7	0.282	1.145	0.005	689	345	-25.8	0.655	0.64	0.21	1.5	81	10	302.6	3	0	0	74	1012	7
5	12	13	347	10	122.1	0.309	1.478	0.005	956	394	-21.7	0.655	0.64	0.19	1.6	78	10	302.4	3	0	0	75	1011	6
5	12	13	347	11	80.8	0.318	1.345	0.005	1087	413	-35.9	0.37	0.38	0.19	2.2	110	10	302.6	3	0	0	70	1011	8
5	12	13	347	12	96.6	0.28	1.496	0.005	1248	340	-20.4	0.37	0.38	0.19	1.8	95	10	304.1	3	0	0	65	1010	7
5	12	13	347	13	72.7	0.304	1.403	0.006	1367	386	-34.9	0.37	0.38	0.19	2.1	92	10	303.6	3	0	0	65	1008	9
5	12	13	347	14	77.7	0.295	1.478	0.008	1495	369	-29.8	0.37	0.38	0.19	2	101	10	304.1	3	0	0	70	1008	8
5	12	13	347	15	58.3	0.299	1.353	0.008	1528	376	-41.3	0.37	0.38	0.19	2.1	106	10	303.6	3	0	0	65	1007	9
5	12	13	347	16	14.9	0.274	0.86	0.008	1532	330	-124	0.37	0.38	0.22	2.1	92	10	301.9	3	0	0	70	1008	10
5	12	13	347	17	0.1	0.17	0.162	0.008	1530	166	-4438.9	0.37	0.38	0.3	1.4	94	10	300.4	3	0	0	70	1008	10
5	12	13	347	18	-3.2	0.067	-9	-9	-999	47	8.3	0.37	0.38	0.63	1.1	99	10	299.1	3	0	0	77	1008	3
5	12	13	347	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	79	10	298.4	3	0	0	82	1008	3
5	12	13	347	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	68	10	297.6	3	0	0	88	1009	0
5	12	13	347	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	100	10	297.4	3	0	0	88	1010	3
5	12	13	347	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	108	10	296.9	3	0	0	88	1010	3
5	12	13	347	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	79	10	296.9	3	0	0	90	1009	0
5	12	13	347	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	78	10	296.5	3	0	0	94	1009	3
5	12	14	348	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	37	10	296.1	3	0	0	90	1009	3
5	12	14	348	2	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	74	10	296.1	3	0	0	97	1008	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	14	348	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	296.2	3	0	0	97	1008	3
5	12	14	348	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	68	10	296.1	3	0	0	97	1008	3
5	12	14	348	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	79	10	296.1	3	0	0	93	1009	0
5	12	14	348	6	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	77	10	296.6	3	0	0	97	1009	3
5	12	14	348	7	-2.4	0.059	-9	-9	-999	33	7.6	0.655	0.64	0.64	0.8	81	10	299.9	3	0	0	97	1010	0
5	12	14	348	8	66.3	0.265	0.788	0.005	266	313	-25.2	0.655	0.64	0.3	1.4	75	10	302	3	0	0	79	1011	0
5	12	14	348	9	116.2	0.321	1.145	0.005	466	417	-25.6	0.655	0.64	0.21	1.7	80	10	303.5	3	0	0	67	1012	0
5	12	14	348	10	95.3	0.279	1.185	0.005	631	340	-20.6	0.37	0.38	0.19	1.8	90	10	304	3	0	0	67	1012	4
5	12	14	348	11	174.8	0.321	1.636	0.005	905	418	-17.1	0.655	0.64	0.18	1.6	85	10	305.2	3	0	0	59	1011	0
5	12	14	348	12	119.7	0.263	1.506	0.005	1028	311	-13.7	0.37	0.38	0.19	1.6	109	10	305.4	3	0	0	59	1010	6
5	12	14	348	13	65.5	0.237	1.258	0.005	1094	265	-18.2	0.37	0.38	0.19	1.5	102	10	304.4	3	0	0	59	1009	9
5	12	14	348	14	90.4	0.278	1.44	0.005	1188	337	-21.3	0.37	0.38	0.19	1.8	88	10	304.8	3	0	0	65	1008	7
5	12	14	348	15	49.9	0.283	1.197	0.005	1236	346	-40.8	0.655	0.64	0.19	1.6	74	10	303.4	3	0	0	59	1008	10
5	12	14	348	16	6.5	0.231	0.607	0.005	1238	256	-170.6	0.37	0.38	0.22	1.8	88	10	301.9	3	0	0	68	1008	10
5	12	14	348	17	0.1	0.194	0.151	0.005	1234	197	-6613.4	0.37	0.38	0.3	1.6	91	10	300.4	3	0	0	77	1008	10
5	12	14	348	18	-2.9	0.066	-9	-9	-999	53	9.1	0.655	0.64	0.62	0.9	69	10	299.2	3	0	0	77	1009	3
5	12	14	348	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	51	10	298.5	3	0	0	74	1009	3
5	12	14	348	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	46	10	297.9	3	0	0	79	1010	7
5	12	14	348	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	297.4	3	0	0	85	1010	3
5	12	14	348	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	50	10	297.1	3	0	0	85	1010	3
5	12	14	348	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	296.6	3	0	0	85	1010	7
5	12	14	348	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	296.4	3	0	0	90	1009	7
5	12	15	349	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	52	10	296.1	3	0	0	90	1009	7
5	12	15	349	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	295.8	3	0	0	87	1008	7
5	12	15	349	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	61	10	295.8	3	0	0	97	1008	7
5	12	15	349	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	68	10	295.5	3	0	0	97	1008	7
5	12	15	349	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	295.8	3	0	0	97	1008	7
5	12	15	349	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	42	10	296.1	3	0	0	93	1009	7
5	12	15	349	7	-3	0.066	-9	-9	-999	39	8.5	0.655	0.64	0.64	0.9	71	10	299.8	3	0	0	97	1010	0
5	12	15	349	8	63.1	0.223	0.57	0.006	106	243	-15.9	0.655	0.64	0.3	1.1	56	10	302.2	3	0	0	80	1011	0
5	12	15	349	9	116.3	0.267	0.992	0.006	303	318	-14.8	0.655	0.64	0.21	1.3	58	10	303.9	3	0	0	63	1011	0
5	12	15	349	10	137.2	0.299	1.268	0.006	536	377	-17.6	0.655	0.64	0.19	1.5	70	10	304.9	3	0	0	59	1011	0
5	12	15	349	11	135.4	0.272	1.422	0.005	765	326	-13.3	0.655	0.64	0.18	1.3	74	10	304.8	3	0	0	55	1010	7
5	12	15	349	12	94.3	0.287	1.315	0.005	868	354	-22.7	0.655	0.64	0.18	1.5	74	10	304.5	3	0	0	53	1009	9
5	12	15	349	13	70.5	0.266	1.209	0.005	901	316	-24.1	0.655	0.64	0.18	1.4	62	10	303.9	3	0	0	52	1008	10
5	12	15	349	14	90.2	0.3	1.333	0.005	945	377	-26.8	0.655	0.64	0.18	1.6	60	10	304.1	3	0	0	61	1008	9
5	12	15	349	15	55.1	0.299	1.141	0.005	970	375	-43.4	0.655	0.64	0.19	1.7	38	10	303.1	3	0	0	59	1008	10
5	12	15	349	16	14.5	0.258	0.733	0.005	975	302	-106.5	0.655	0.64	0.21	1.6	36	10	301.9	3	0	0	58	1008	10
5	12	15	349	17	1.1	0.238	0.311	0.005	974	267	-1089.7	0.655	0.64	0.29	1.6	34	10	300.5	3	0	0	65	1008	10
5	12	15	349	18	-3	0.073	-9	-9	-999	76	11.9	0.655	0.64	0.61	1	44	10	298.9	3	0	0	72	1009	7
5	12	15	349	19	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	58	10	298.4	3	0	0	77	1009	0
5	12	15	349	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	67	10	298	3	0	0	82	1010	7
5	12	15	349	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	69	10	298	3	0	0	82	1010	7
5	12	15	349	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	75	10	297.9	3	0	0	79	1011	3
5	12	15	349	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	52	10	297.8	3	0	0	82	1010	7
5	12	15	349	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	29	10	297.5	3	0	0	85	1010	7
5	12	16	350	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	51	10	297.6	3	0	0	85	1010	3
5	12	16	350	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	297.4	3	0	0	94	1009	7
5	12	16	350	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	297.2	3	0	0	94	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	16	350	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.1	3	0	0	94	1009	7
5	12	16	350	5	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	297	3	0	0	87	1010	7
5	12	16	350	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	101	10	296.8	3	0	0	94	1010	7
5	12	16	350	7	-2.8	0.061	-9	-9	-999	34	7.1	0.37	0.38	0.65	1	87	10	299.1	3	0	0	94	1011	0
5	12	16	350	8	18	0.209	0.429	0.005	157	220	-45.9	0.655	0.64	0.3	1.2	82	10	298.4	3	0	0	91	1012	9
5	12	16	350	9	90.4	0.232	1.073	0.005	494	258	-12.5	0.655	0.64	0.21	1.1	63	10	301	3	0	0	94	1012	0
5	12	16	350	10	104.1	0.236	1.337	0.006	830	264	-11.4	0.655	0.64	0.19	1.1	60	10	302	3	0	0	74	1012	7
5	12	16	350	11	61	0.143	1.167	0.007	941	127	-4.3	0.37	0.38	0.19	0.7	114	10	303.1	3	0	0	70	1011	9
5	12	16	350	12	18.1	0.13	0.786	0.008	969	108	-10.9	0.655	0.64	0.18	0.6	19	10	300.4	3	0	9.14	65	1010	10
5	12	16	350	13	2.6	0.178	0.412	0.008	967	173	-197.1	0.37	0.38	0.19	1.4	118	10	297	3	0	7.37	88	1010	10
5	12	16	350	14	0.1	0.075	0.139	0.008	968	53	-377.3	0.37	0.38	0.19	0.6	108	10	296.9	3	0	3.05	88	1009	10
5	12	16	350	15	3.7	0.122	0.463	0.008	974	98	-45.1	0.655	0.64	0.19	0.7	66	10	296.9	3	0	0.51	88	1009	10
5	12	16	350	16	10.6	0.188	0.664	0.008	994	187	-56.4	0.655	0.64	0.21	1.1	48	10	297.4	3	0	0	94	1010	10
5	12	16	350	17	1.1	0.181	0.314	0.008	996	177	-477.2	0.655	0.64	0.29	1.2	82	10	297.4	3	0	0	88	1009	10
5	12	16	350	18	-2.8	0.067	-9	-9	-999	49	9.7	0.37	0.38	0.62	1.1	103	10	296.9	3	0	0	88	1010	7
5	12	16	350	19	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	88	10	296.9	3	0	0	94	1010	7
5	12	16	350	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	47	10	296.6	3	0	0	94	1011	7
5	12	16	350	21	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	80	10	296.4	3	0	0	94	1012	7
5	12	16	350	22	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	104	10	296.4	3	0	0	95	1012	0
5	12	16	350	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	93	10	296.9	3	0	0	97	1012	0
5	12	16	350	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	296.9	3	0	0.25	100	1012	7
5	12	17	351	1	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	68	10	296.5	3	0	0	98	1011	0
5	12	17	351	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	72	10	296.6	3	0	0	97	1011	7
5	12	17	351	3	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	61	10	296.6	3	0	0	97	1011	0
5	12	17	351	4	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	95	10	296.6	3	0	0	97	1011	0
5	12	17	351	5	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	103	10	296.9	3	0	0	97	1012	7
5	12	17	351	6	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	71	10	296.9	3	0	0	100	1012	7
5	12	17	351	7	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	0.66	0.7	92	10	297.9	3	0	0	94	1014	0
5	12	17	351	8	7.2	0.155	-9	-9	-999	140	-46.3	0.37	0.38	0.31	1.1	98	10	297.9	3	0	1.27	999	1014	10
5	12	17	351	9	37.5	0.158	-9	-9	-999	144	-9.4	0.37	0.38	0.22	0.9	86	10	298.2	3	0	1.02	999	1015	9
5	12	17	351	10	39.5	0.203	-9	-9	-999	211	-19.3	0.37	0.38	0.2	1.3	91	10	300	3	0	0	999	1015	9
5	12	17	351	11	78.8	0.256	-9	-9	-999	297	-19.2	0.655	0.64	0.18	1.3	84	10	299.8	3	0	0.51	82	1014	9
5	12	17	351	12	158	0.317	-9	-9	-999	410	-18.2	0.655	0.64	0.18	1.6	73	10	302.9	3	0	0	82	1013	6
5	12	17	351	13	30.4	0.245	-9	-9	-999	282	-44	0.655	0.64	0.18	1.4	73	10	299.9	3	0	3.3	79	1013	10
5	12	17	351	14	72.8	0.217	-9	-9	-999	232	-12.6	0.37	0.38	0.19	1.3	96	10	301.2	3	0	0.25	77	1012	8
5	12	17	351	15	54.2	0.275	-9	-9	-999	333	-34.8	0.37	0.38	0.19	1.9	98	10	302.8	3	0	0	65	1012	9
5	12	17	351	16	24.5	0.27	-9	-9	-999	323	-72.7	0.37	0.38	0.22	2	100	10	301.6	3	0	0	63	1012	10
5	12	17	351	17	0.1	0.191	-9	-9	-999	194	-6307.8	0.655	0.64	0.29	1.3	81	10	299.9	3	0	0	67	1012	10
5	12	17	351	18	-3	0.066	-9	-9	-999	52	8.8	0.655	0.64	0.61	0.9	70	10	298.5	3	0	0	70	1012	0
5	12	17	351	19	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	95	10	297.6	3	0	0	73	1013	0
5	12	17	351	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	68	10	297.4	3	0	0	77	1014	7
5	12	17	351	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	100	10	296.6	3	0	0	80	1014	7
5	12	17	351	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	296.5	3	0	0	84	1014	3
5	12	17	351	23	-2.5	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	64	10	296.2	3	0	0	94	1013	3
5	12	17	351	24	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	54	10	296	3	0	0	94	1013	3
5	12	18	352	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	295.9	3	0	0	90	1013	3
5	12	18	352	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	130	10	295.4	3	0	0	87	1012	3
5	12	18	352	3	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	94	10	295.2	3	0	0	90	1012	3
5	12	18	352	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	294.9	3	0	0	90	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	18	352	5	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	122	10	294.9	3	0	0	84	1013	0
5	12	18	352	6	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	130	10	295	3	0	0	93	1014	3
5	12	18	352	7	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	0.66	0.7	110	10	298.6	3	0	0	93	1015	0
5	12	18	352	8	65	0.21	-9	-9	-999	222	-12.9	0.655	0.64	0.3	1	53	10	301.1	3	0	0	82	1015	0
5	12	18	352	9	118.8	0.308	-9	-9	-999	392	-22.2	0.655	0.64	0.21	1.6	68	10	302.5	3	0	0	63	1015	0
5	12	18	352	10	145.3	0.314	-9	-9	-999	405	-19.3	0.655	0.64	0.19	1.6	76	10	303.6	3	0	0	48	1015	0
5	12	18	352	11	142	0.287	-9	-9	-999	354	-15.1	0.655	0.64	0.18	1.4	77	10	303.8	3	0	0	45	1015	7
5	12	18	352	12	115.5	0.226	-9	-9	-999	247	-9	0.655	0.64	0.18	1	61	10	303.9	3	0	0	999	1014	8
5	12	18	352	13	71.7	0.182	-9	-9	-999	179	-7.6	0.37	0.38	0.19	1	89	10	304.1	3	0	0	999	1012	9
5	12	18	352	14	43.5	0.216	-9	-9	-999	232	-21	0.37	0.38	0.19	1.4	109	10	302.9	3	0	0	999	1012	10
5	12	18	352	15	18	0.232	-9	-9	-999	258	-62.8	0.37	0.38	0.19	1.7	111	10	302.2	3	0	0	51	1012	10
5	12	18	352	16	2.5	0.201	-9	-9	-999	207	-294	0.37	0.38	0.22	1.6	114	10	300.9	3	0	0	51	1012	10
5	12	18	352	17	0.1	0.158	-9	-9	-999	145	-3577.5	0.37	0.38	0.3	1.3	108	10	299.4	3	0	0	53	1013	10
5	12	18	352	18	-3.2	0.067	-9	-9	-999	43	8.5	0.37	0.38	0.61	1.1	95	10	297.9	3	0	0	65	1013	3
5	12	18	352	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	73	10	297	3	0	0	74	1013	3
5	12	18	352	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	59	10	296.2	3	0	0	76	1014	0
5	12	18	352	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	70	10	295.6	3	0	0	79	1014	3
5	12	18	352	22	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	65	10	295.4	3	0	0	84	1014	3
5	12	18	352	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	109	10	295.2	3	0	0	87	1014	0
5	12	18	352	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	294.6	3	0	0	84	1013	3
5	12	19	353	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	100	10	294.4	3	0	0	79	1013	3
5	12	19	353	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	111	10	294.4	3	0	0	87	1012	0
5	12	19	353	3	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	93	10	294	3	0	0	93	1012	3
5	12	19	353	4	-1	0.037	-9	-9	-999	16	4.5	0.655	0.64	1	0.5	35	10	293.9	3	0	0	999	1012	0
5	12	19	353	5	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.5	67	10	293.8	3	0	0	999	1012	99
5	12	19	353	6	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	97	10	294.4	3	0	0	999	1013	0
5	12	19	353	7	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	0.67	0.8	114	10	298	3	0	0	999	1014	0
5	12	19	353	8	64.9	0.237	0.996	0.005	551	265	-18.6	0.655	0.64	0.31	1.2	65	10	301.1	3	0	0	74	1014	0
5	12	19	353	9	113.6	0.345	1.359	0.005	801	467	-32.8	0.655	0.64	0.21	1.9	80	10	302.5	3	0	0	53	1015	0
5	12	19	353	10	92.1	0.321	1.315	0.005	895	419	-32.6	0.37	0.38	0.2	2.2	90	10	303.4	3	0	0	59	1014	0
5	12	19	353	11	165	0.397	1.695	0.005	1069	576	-34.4	0.655	0.64	0.18	2.2	82	10	304	3	0	0	53	1014	0
5	12	19	353	12	122.9	0.319	1.598	0.005	1200	417	-23.8	0.37	0.38	0.19	2.1	99	10	304.4	3	0	0	56	1013	5
5	12	19	353	13	87.6	0.309	1.463	0.005	1291	396	-30.4	0.37	0.38	0.19	2.1	90	10	303.5	3	0	0	59	1012	8
5	12	19	353	14	85	0.308	1.482	0.005	1381	394	-31.1	0.37	0.38	0.19	2.1	92	10	303.6	3	0	0	63	1011	8
5	12	19	353	15	60.5	0.3	1.343	0.005	1444	378	-40.2	0.37	0.38	0.19	2.1	99	10	303.1	3	0	0	65	1010	8
5	12	19	353	16	9.9	0.258	0.735	0.005	1449	301	-156.4	0.37	0.38	0.22	2	97	10	301.2	3	0	0	67	1011	10
5	12	19	353	17	0.1	0.206	0.159	0.005	1445	215	-7857.7	0.655	0.64	0.29	1.4	81	10	299.9	3	0	0	69	1011	10
5	12	19	353	18	-3.1	0.067	-9	-9	-999	59	8.5	0.37	0.38	0.6	1.1	98	10	298.6	3	0	0	74	1011	3
5	12	19	353	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	103	10	297.8	3	0	0	79	1012	3
5	12	19	353	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	297.5	3	0	0	85	1013	3
5	12	19	353	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	297.4	3	0	0	85	1013	3
5	12	19	353	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	93	10	296.9	3	0	0	84	1013	3
5	12	19	353	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	85	10	296.5	3	0	0	84	1013	3
5	12	19	353	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	73	10	296	3	0	0	90	1012	3
5	12	20	354	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	91	10	295.6	3	0	0	90	1012	3
5	12	20	354	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	295.5	3	0	0	90	1012	3
5	12	20	354	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	102	10	295.4	3	0	0	93	1012	3
5	12	20	354	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	112	10	295.1	3	0	0	100	1012	3
5	12	20	354	5	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	108	10	294.9	3	0	0	93	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	20	354	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	98	10	295.2	3	0	0	93	1013	7
5	12	20	354	7	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	0.67	0.8	101	10	298.9	3	0	0	87	1014	0
5	12	20	354	8	63.3	0.25	0.723	0.005	216	287	-22.3	0.655	0.64	0.31	1.3	77	10	301.4	3	0	0	75	1014	0
5	12	20	354	9	78.8	0.285	0.925	0.005	363	349	-26.4	0.37	0.38	0.22	1.9	88	10	302.8	3	0	0	63	1015	0
5	12	20	354	10	105.8	0.314	1.179	0.005	561	405	-26.5	0.37	0.38	0.2	2.1	96	10	303.5	3	0	0	59	1014	0
5	12	20	354	11	167.3	0.319	1.571	0.005	840	415	-17.6	0.655	0.64	0.18	1.6	78	10	304.6	3	0	0	55	1014	2
5	12	20	354	12	146.4	0.328	1.545	0.005	912	432	-21.7	0.655	0.64	0.18	1.7	84	10	304.4	3	0	0	56	1013	7
5	12	20	354	13	65.1	0.237	1.194	0.005	943	268	-18.3	0.37	0.38	0.19	1.5	86	10	303.5	3	0	0	57	1012	9
5	12	20	354	14	62.8	0.276	1.291	0.005	1237	334	-30.2	0.655	0.64	0.18	1.5	80	10	303.4	3	0	0	59	1011	10
5	12	20	354	15	11.6	0.226	0.749	0.005	1303	248	-89.7	0.37	0.38	0.19	1.7	97	10	301.8	3	0	0	60	1011	10
5	12	20	354	16	14.8	0.24	0.836	0.006	1423	271	-84.6	0.37	0.38	0.22	1.8	96	10	301.5	3	0	0	61	1011	10
5	12	20	354	17	0.1	0.158	0.157	0.006	1394	147	-3574	0.37	0.38	0.3	1.3	98	10	300.1	3	0	0	63	1012	10
5	12	20	354	18	-2.6	0.067	-9	-9	-999	44	10.2	0.37	0.38	0.6	1.1	101	10	298.8	3	0	0	69	1012	7
5	12	20	354	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	100	10	297.9	3	0	0	74	1013	7
5	12	20	354	20	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	90	10	297.4	3	0	0	79	1013	7
5	12	20	354	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	93	10	296.9	3	0	0	79	1014	7
5	12	20	354	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	104	10	296.6	3	0	0	84	1014	3
5	12	20	354	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	296.1	3	0	0	87	1014	0
5	12	20	354	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	61	10	295.8	3	0	0	90	1013	3
5	12	21	355	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	295.6	3	0	0	90	1012	3
5	12	21	355	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	295.5	3	0	0	87	1012	3
5	12	21	355	3	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	84	10	295.2	3	0	0	90	1012	0
5	12	21	355	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	294.8	3	0	0	93	1012	3
5	12	21	355	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	80	10	294.4	3	0	0	93	1013	0
5	12	21	355	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	294.9	3	0	0	87	1013	3
5	12	21	355	7	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	0.67	1	72	10	298.4	3	0	0	87	1014	0
5	12	21	355	8	64.6	0.264	1.212	0.005	1000	312	-25.7	0.655	0.64	0.31	1.4	72	10	301.2	3	0	0	77	1015	0
5	12	21	355	9	82.4	0.297	1.353	0.005	1089	371	-28.6	0.37	0.38	0.22	2	86	10	302.6	3	0	0	59	1015	0
5	12	21	355	10	107	0.326	1.538	0.007	1232	427	-29.2	0.37	0.38	0.2	2.2	100	10	303.5	3	0	0	51	1015	0
5	12	21	355	11	118.4	0.296	1.659	0.008	1395	371	-19.8	0.37	0.38	0.19	1.9	100	10	304.4	3	0	0	50	1014	0
5	12	21	355	12	116.8	0.285	1.697	0.009	1516	350	-17.9	0.37	0.38	0.19	1.8	106	10	304.4	3	0	0	45	1013	6
5	12	21	355	13	95.4	0.279	1.596	0.008	1542	339	-20.6	0.37	0.38	0.19	1.8	102	10	304.1	3	0	0	48	1013	8
5	12	21	355	14	80.2	0.264	1.511	0.008	1556	311	-20.6	0.37	0.38	0.19	1.7	104	10	304	3	0	0	52	1012	8
5	12	21	355	15	59.5	0.267	1.372	0.008	1567	317	-28.8	0.37	0.38	0.19	1.8	108	10	303.8	3	0	0	55	1012	8
5	12	21	355	16	29.6	0.241	1.089	0.008	1572	273	-42.8	0.37	0.38	0.22	1.7	103	10	302.5	3	0	0	55	1012	9
5	12	21	355	17	0.1	0.158	0.164	0.008	1571	147	-3576.3	0.37	0.38	0.29	1.3	108	10	300.2	3	0	0	63	1012	10
5	12	21	355	18	-1.6	0.049	-9	-9	-999	36	6.3	0.37	0.38	0.6	0.8	113	10	298.5	3	0	0	69	1013	3
5	12	21	355	19	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	109	10	297.9	3	0	0	69	1013	3
5	12	21	355	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	72	10	297.4	3	0	0	79	1014	3
5	12	21	355	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	84	10	297	3	0	0	90	1014	3
5	12	21	355	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	296.8	3	0	0	97	1013	3
5	12	21	355	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	110	10	296.1	3	0	0	97	1013	7
5	12	21	355	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	295.9	3	0	0	97	1013	3
5	12	22	356	1	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	60	10	296.1	3	0	0	90	1012	0
5	12	22	356	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	69	10	296.6	3	0	0	94	1012	7
5	12	22	356	3	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	74	10	296.4	3	0	0	94	1012	0
5	12	22	356	4	-5	0.079	-9	-9	-999	51	8.9	0.37	0.38	1	1.3	90	10	296.4	3	0	0	94	1013	0
5	12	22	356	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	111	10	296.4	3	0	0	97	1013	7
5	12	22	356	6	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	81	10	296.4	3	0	0	95	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	22	356	7	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	0.68	0.8	68	10	297.9	3	0	0	94	1015	0
5	12	22	356	8	58.1	0.194	0.773	0.005	288	196	-11.3	0.655	0.64	0.31	0.9	84	10	300.9	3	0	0	85	1015	0
5	12	22	356	9	79.8	0.252	1.059	0.005	539	292	-18.3	0.37	0.38	0.22	1.6	106	10	302.2	3	0	0	67	1016	0
5	12	22	356	10	92.2	0.3	1.273	0.005	811	377	-26.4	0.37	0.38	0.2	2	108	10	302.9	3	0	0	70	1015	4
5	12	22	356	11	65.6	0.28	1.151	0.005	843	341	-30.3	0.37	0.38	0.19	1.9	101	10	301.9	3	0	0	70	1015	9
5	12	22	356	12	93.1	0.27	1.317	0.005	888	322	-19	0.736	0.77	0.18	1.3	142	10	301.9	3	0	0	66	1014	9
5	12	22	356	13	67.3	0.259	1.197	0.005	922	303	-23.3	0.37	0.38	0.19	1.7	105	10	302.6	3	0	0	62	1013	9
5	12	22	356	14	72.4	0.282	1.274	0.005	1033	345	-28.1	0.37	0.38	0.19	1.9	114	10	303.4	3	0	0	59	1012	8
5	12	22	356	15	31.2	0.275	0.977	0.005	1077	331	-59.8	0.37	0.38	0.19	2	92	10	300.9	3	0	0	77	1012	10
5	12	22	356	16	38.4	0.277	1.066	0.005	1142	335	-50	0.655	0.64	0.21	1.6	78	10	301	3	0	0	72	1012	9
5	12	22	356	17	0.1	0.22	0.147	0.005	1137	239	-8888	0.655	0.64	0.29	1.5	85	10	299.9	3	0	0	69	1013	10
5	12	22	356	18	-8.7	0.117	-9	-9	-999	97	16.9	0.655	0.64	0.58	1.6	66	10	298.4	3	0	0	79	1013	3
5	12	22	356	19	-9.8	0.117	-9	-9	-999	93	14.9	0.655	0.64	1	1.6	73	10	296.9	3	0	0	94	1013	3
5	12	22	356	20	-7.7	0.11	-9	-9	-999	84	15.7	0.655	0.64	1	1.5	84	10	296.9	3	0	0	97	1014	7
5	12	22	356	21	-2.4	0.055	-9	-9	-999	30	6.2	0.37	0.38	1	0.9	94	10	296.6	3	0	0	98	1014	0
5	12	22	356	22	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	75	10	296.4	3	0	0.25	100	1014	7
5	12	22	356	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	88	10	296.5	3	0	0.25	100	1014	0
5	12	22	356	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	89	10	296.5	3	0	0	100	1013	7
5	12	23	357	1	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	96	10	296.2	3	0	0	100	1013	7
5	12	23	357	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	295.8	3	0	0	97	1013	0
5	12	23	357	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	80	10	295.4	3	0	0	100	1012	3
5	12	23	357	4	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	62	10	295.8	3	0	0	98	1013	0
5	12	23	357	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	295.9	3	0	0	97	1013	7
5	12	23	357	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	295.8	3	0	0	100	1014	3
5	12	23	357	7	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	0.68	0.8	75	10	299.2	3	0	0	97	1014	0
5	12	23	357	8	30.3	0.245	0.404	0.005	78	280	-44.1	0.655	0.64	0.31	1.4	67	10	300	3	0	0	94	1015	0
5	12	23	357	9	54.6	0.232	0.692	0.005	220	258	-20.8	0.37	0.38	0.22	1.5	89	10	300.4	3	0	0	86	1015	6
5	12	23	357	10	114.5	0.32	1.179	0.005	519	416	-25.9	0.655	0.64	0.19	1.7	75	10	301.8	3	0	0	78	1015	7
5	12	23	357	11	113.3	0.261	1.346	0.005	779	309	-14.3	0.37	0.38	0.19	1.6	98	10	303.4	3	0	0	70	1014	4
5	12	23	357	12	105.4	0.248	1.372	0.005	885	285	-13.1	0.37	0.38	0.19	1.5	103	10	304.1	3	0	0	64	1013	7
5	12	23	357	13	74	0.316	1.256	0.005	967	408	-38.4	0.37	0.38	0.19	2.2	121	10	303.6	3	0	0	59	1012	9
5	12	23	357	14	54.7	0.298	1.159	0.006	1027	374	-43.4	0.37	0.38	0.19	2.1	126	10	302.9	3	0	0	65	1011	9
5	12	23	357	15	30.3	0.22	0.962	0.006	1058	239	-31.6	0.37	0.38	0.19	1.5	95	10	301.9	3	0	0	94	1011	10
5	12	23	357	16	8.3	0.189	0.625	0.006	1064	189	-73.6	0.37	0.38	0.21	1.4	104	10	300.1	3	0	0	74	1011	10
5	12	23	357	17	0.1	0.122	0.143	0.006	1058	99	-1644.1	0.37	0.38	0.29	1	97	10	297.2	3	0	1.52	77	1011	10
5	12	23	357	18	-1.7	0.051	-9	-9	-999	29	7.4	0.655	0.64	0.58	0.7	83	10	297.2	3	0	0	88	1011	3
5	12	23	357	19	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	297.1	3	0	0	94	1012	3
5	12	23	357	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	107	10	296.9	3	0	0	94	1013	3
5	12	23	357	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	106	10	296.6	3	0	0.25	94	1013	3
5	12	23	357	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	296.8	3	0	0	94	1013	3
5	12	23	357	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	58	10	296.6	3	0	0	94	1013	3
5	12	23	357	24	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	63	10	296.2	3	0	0	999	1012	0
5	12	24	358	1	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	296.2	3	0	0	999	1011	0
5	12	24	358	2	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	91	10	296.6	3	0	0	999	1011	99
5	12	24	358	3	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	296.6	3	0	1.27	100	1011	7
5	12	24	358	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	296.9	3	0	0.25	94	1011	7
5	12	24	358	5	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	76	10	296.8	3	0	0.25	94	1012	10
5	12	24	358	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	296.8	3	0	0.25	100	1012	7
5	12	24	358	7	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	0.69	0.7	68	10	297.4	3	0	0.25	98	1013	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	24	358	8	20.3	0.147	0.428	0.005	139	130	-14.2	0.37	0.38	0.32	0.9	93	10	299	3	0	0	97	1014	7
5	12	24	358	9	57.2	0.222	0.738	0.005	254	241	-17.4	0.37	0.38	0.22	1.4	92	10	301.4	3	0	0	88	1014	5
5	12	24	358	10	61.3	0.289	0.863	0.005	378	358	-35.8	0.37	0.38	0.2	2	100	10	302.4	3	0	0	80	1014	8
5	12	24	358	11	68	0.292	0.99	0.005	515	362	-33	0.37	0.38	0.19	2	92	10	302	3	0	0	79	1013	8
5	12	24	358	12	64.6	0.302	1.05	0.005	646	381	-38.3	0.37	0.38	0.19	2.1	93	10	302.2	3	0	0	79	1012	9
5	12	24	358	13	18.9	0.233	0.71	0.005	682	260	-60.4	0.37	0.38	0.19	1.7	90	10	300.8	3	0	0	79	1011	10
5	12	24	358	14	9.5	0.257	0.57	0.005	698	300	-161.1	0.37	0.38	0.19	2	125	10	299.1	3	0	0	79	1011	10
5	12	24	358	15	11.6	0.204	0.615	0.005	719	213	-66	0.37	0.38	0.19	1.5	118	10	298.2	3	0	0	77	1011	10
5	12	24	358	16	7.9	0.167	0.545	0.005	737	157	-53	0.37	0.38	0.21	1.2	105	10	299	3	0	0	75	1011	10
5	12	24	358	17	0.1	0.17	0.127	0.005	736	162	-4453.7	0.37	0.38	0.29	1.4	95	10	298.5	3	0	0	74	1011	10
5	12	24	358	18	-1.7	0.049	-9	-9	-999	40	6	0.37	0.38	0.58	0.8	121	10	298	3	0	0	78	1012	0
5	12	24	358	19	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	71	10	297.4	3	0	0	82	1012	7
5	12	24	358	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	82	10	297.1	3	0	0	82	1012	0
5	12	24	358	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	106	10	296.9	3	0	0	85	1013	7
5	12	24	358	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	83	10	296.6	3	0	0	85	1013	3
5	12	24	358	23	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	77	10	296.4	3	0	0	82	1013	0
5	12	24	358	24	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	72	10	295.9	3	0	0	86	1013	99
5	12	25	359	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	295.4	3	0	0	90	1012	3
5	12	25	359	2	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	105	10	295.4	3	0	0	93	1012	0
5	12	25	359	3	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	114	10	295.6	3	0	0	90	1012	3
5	12	25	359	4	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	50	10	295.2	3	0	0	93	1012	0
5	12	25	359	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	52	10	294.8	3	0	0	97	1012	0
5	12	25	359	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	66	10	295	3	0	0	100	1012	3
5	12	25	359	7	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	0.7	0.7	86	10	299.2	3	0	0	100	1013	0
5	12	25	359	8	62.4	0.209	0.699	0.006	197	220	-13.3	0.655	0.64	0.31	1	81	10	301.4	3	0	0	82	1014	0
5	12	25	359	9	72.7	0.216	0.862	0.006	318	232	-12.6	0.37	0.38	0.22	1.3	94	10	302.9	3	0	0	74	1014	0
5	12	25	359	10	94.7	0.268	1.076	0.005	476	319	-18.4	0.37	0.38	0.2	1.7	108	10	303.9	3	0	0	70	1014	0
5	12	25	359	11	121.2	0.274	1.316	0.005	680	331	-15.4	0.37	0.38	0.19	1.7	114	10	305	3	0	0	67	1013	0
5	12	25	359	12	103.2	0.281	1.341	0.005	844	343	-19.5	0.37	0.38	0.19	1.8	117	10	304.9	3	0	0	67	1012	7
5	12	25	359	13	88.2	0.255	1.316	0.005	933	297	-17	0.37	0.38	0.19	1.6	115	10	304.8	3	0	0	67	1012	8
5	12	25	359	14	67.8	0.248	1.254	0.006	1049	285	-20.4	0.37	0.38	0.19	1.6	122	10	304.1	3	0	0	68	1011	9
5	12	25	359	15	58.5	0.255	1.236	0.008	1164	297	-25.7	0.37	0.38	0.19	1.7	134	10	304	3	0	0	65	1010	9
5	12	25	359	16	18.8	0.212	0.853	0.008	1192	224	-45.5	0.37	0.38	0.21	1.5	100	10	302.2	3	0	0	88	1011	10
5	12	25	359	17	0.1	0.191	0.149	0.008	1182	192	-6299.5	0.655	0.64	0.28	1.3	77	10	300	3	0	0	77	1011	10
5	12	25	359	18	-3.4	0.079	-9	-9	-999	58	13	0.37	0.38	0.58	1.3	94	10	299.1	3	0	0.25	77	1012	7
5	12	25	359	19	-4.3	0.079	-9	-9	-999	51	10.2	0.37	0.38	1	1.3	86	10	296.6	3	0	1.02	82	1012	7
5	12	25	359	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	65	10	296.4	3	0	0	94	1013	7
5	12	25	359	21	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	77	10	296.5	3	0	0.76	94	1013	7
5	12	25	359	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	65	10	296.9	3	0	0	94	1013	3
5	12	25	359	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	91	10	297	3	0	0.76	97	1013	7
5	12	25	359	24	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	110	10	296.9	3	0	6.1	94	1013	7
5	12	26	360	1	-5	0.085	-9	-9	-999	57	11	0.37	0.38	1	1.4	129	10	296.4	3	0	4.32	94	1012	7
5	12	26	360	2	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	126	10	296.6	3	0	0.25	97	1011	7
5	12	26	360	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	112	10	296.8	3	0	0	94	1011	7
5	12	26	360	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	296.9	3	0	0	94	1012	3
5	12	26	360	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	59	10	296.8	3	0	0	87	1012	7
5	12	26	360	6	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	47	10	296.6	3	0	0	85	1012	3
5	12	26	360	7	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	0.7	0.8	61	10	298.9	3	0	0	90	1014	0
5	12	26	360	8	62	0.249	1.063	0.005	701	286	-22.6	0.655	0.64	0.31	1.3	81	10	300.9	3	0	0.25	77	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	26	360	9	74.8	0.283	1.149	0.005	734	347	-27.5	0.37	0.38	0.22	1.9	95	10	302.2	3	0	0	72	1014	0
5	12	26	360	10	76.1	0.305	1.179	0.005	779	388	-33.8	0.37	0.38	0.2	2.1	88	10	302.5	3	0	0	63	1015	7
5	12	26	360	11	88.5	0.277	1.266	0.005	830	336	-21.7	0.37	0.38	0.19	1.8	90	10	303.2	3	0	0	61	1014	7
5	12	26	360	12	108.9	0.315	1.548	0.006	1233	407	-26	0.37	0.38	0.19	2.1	108	10	303.5	3	0	0	58	1013	7
5	12	26	360	13	112.8	0.306	1.659	0.01	1464	389	-22.8	0.37	0.38	0.19	2	100	10	303.9	3	0	0	55	1012	6
5	12	26	360	14	93.9	0.29	1.57	0.01	1487	359	-23.3	0.37	0.38	0.19	1.9	100	10	304	3	0	0	57	1011	7
5	12	26	360	15	65.7	0.269	1.399	0.01	1503	321	-26.7	0.37	0.38	0.19	1.8	97	10	303.6	3	0	0	59	1011	8
5	12	26	360	16	27.2	0.25	1.044	0.01	1509	288	-52.1	0.37	0.38	0.21	1.8	100	10	302.4	3	0	0	63	1011	9
5	12	26	360	17	0.1	0.17	0.161	0.01	1508	163	-4453.7	0.37	0.38	0.29	1.4	89	10	300.1	3	0	0	65	1011	10
5	12	26	360	18	-2.4	0.067	-9	-9	-999	46	11.1	0.37	0.38	0.57	1.1	93	10	298.8	3	0	0	74	1012	7
5	12	26	360	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	68	10	297.8	3	0	0	79	1012	7
5	12	26	360	20	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	76	10	297.4	3	0	0	82	1013	7
5	12	26	360	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	63	10	296.8	3	0	0	74	1013	7
5	12	26	360	22	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	58	10	296.1	3	0	0	79	1013	7
5	12	26	360	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	66	10	295.9	3	0	0	84	1014	7
5	12	26	360	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	295.4	3	0	0	84	1013	7
5	12	27	361	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	61	10	295.4	3	0	0	87	1013	7
5	12	27	361	2	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	71	10	295.4	3	0	0	84	1012	0
5	12	27	361	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	83	10	294.9	3	0	0	93	1011	7
5	12	27	361	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	294.4	3	0	0	93	1011	7
5	12	27	361	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	86	10	294	3	0	0	93	1012	0
5	12	27	361	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	294.4	3	0	0	100	1012	7
5	12	27	361	7	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	0.7	0.7	83	10	298	3	0	0	93	1013	0
5	12	27	361	8	58.7	0.194	0.609	0.005	139	196	-11.2	0.655	0.64	0.32	0.9	47	10	300.5	3	0	0	82	1014	0
5	12	27	361	9	116.5	0.24	1.104	0.005	418	270	-10.7	0.655	0.64	0.22	1.1	67	10	302.4	3	0	0	69	1014	0
5	12	27	361	10	144.9	0.288	1.454	0.005	767	355	-14.9	0.655	0.64	0.19	1.4	81	10	303.4	3	0	0	62	1014	0
5	12	27	361	11	156.3	0.249	1.582	0.005	917	286	-8.9	0.655	0.64	0.18	1.1	62	10	303.9	3	0	0	55	1013	5
5	12	27	361	12	115	0.28	1.478	0.006	1015	341	-17.3	0.655	0.64	0.18	1.4	348	10	303	3	0	0	48	1012	8
5	12	27	361	13	51.2	0.245	1.145	0.006	1057	279	-25.8	0.655	0.64	0.18	1.3	346	10	301.8	3	0	0	50	1011	10
5	12	27	361	14	34.8	0.235	1.016	0.007	1087	263	-33.7	0.655	0.64	0.18	1.3	354	10	301.5	3	0	0	53	1010	10
5	12	27	361	15	18.4	0.21	0.826	0.007	1102	221	-45.1	0.655	0.64	0.19	1.2	29	10	301.4	3	0	0	51	1009	10
5	12	27	361	16	3.4	0.135	0.472	0.007	1103	115	-64.3	0.655	0.64	0.21	0.8	74	10	300.5	3	0	0	56	1010	10
5	12	27	361	17	0.1	0.104	0.145	0.007	1102	77	-1015	0.655	0.64	0.28	0.7	81	10	300	3	0	0	61	1010	10
5	12	27	361	18	-1.3	0.051	-9	-9	-999	27	9.6	0.655	0.64	0.56	0.7	66	10	298.6	3	0	0	65	1011	7
5	12	27	361	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	297.9	3	0	0	69	1012	7
5	12	27	361	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	84	10	297.1	3	0	0	82	1012	0
5	12	27	361	21	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	88	10	296.9	3	0	0	83	1013	99
5	12	27	361	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	296.2	3	0	0	84	1012	3
5	12	27	361	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	296	3	0	0	87	1012	7
5	12	27	361	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	104	10	295.8	3	0	0	90	1012	3
5	12	28	362	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	296	3	0	0	93	1011	3
5	12	28	362	2	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	83	10	296	3	0	0	87	1010	3
5	12	28	362	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	295.5	3	0	0	100	1010	3
5	12	28	362	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	295.2	3	0	0	100	1010	3
5	12	28	362	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	85	10	295	3	0	0	93	1010	3
5	12	28	362	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	101	10	295.2	3	0	0	93	1011	3
5	12	28	362	7	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	0.72	0.8	98	10	298.9	3	0	0	93	1012	0
5	12	28	362	8	43.9	0.16	0.649	0.005	225	148	-8.5	0.37	0.38	0.32	0.9	87	10	301.4	3	0	0	85	1013	0
5	12	28	362	9	118.6	0.211	1.125	0.005	434	223	-7.2	0.655	0.64	0.22	0.9	77	10	303.2	3	0	0	79	1013	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	28	362	10	154.3	0.262	1.446	0.005	708	309	-10.6	0.655	0.64	0.19	1.2	84	10	304.1	3	0	0	59	1013	0
5	12	28	362	11	123.8	0.269	1.437	0.005	866	321	-14.2	0.655	0.64	0.18	1.3	354	10	303.4	3	0	0	48	1012	8
5	12	28	362	12	67.7	0.265	1.205	0.005	933	314	-24.8	0.655	0.64	0.18	1.4	343	10	302.1	3	0	0	55	1011	10
5	12	28	362	13	40.5	0.186	1.031	0.005	975	187	-14.3	0.655	0.64	0.18	0.9	34	10	301.9	3	0	0	59	1010	10
5	12	28	362	14	42.1	0.237	1.06	0.006	1020	266	-28.6	0.37	0.38	0.19	1.6	93	10	302.4	3	0	0	59	1009	10
5	12	28	362	15	39.4	0.258	1.051	0.006	1061	301	-39.2	0.37	0.38	0.19	1.8	92	10	302.6	3	0	0	63	1009	10
5	12	28	362	16	7.4	0.21	0.603	0.006	1064	222	-112.5	0.37	0.38	0.21	1.6	98	10	301	3	0	0	65	1009	10
5	12	28	362	17	0.1	0.219	0.144	0.006	1062	235	-8888	0.37	0.38	0.29	1.8	93	10	299.9	3	0	0	67	1009	10
5	12	28	362	18	-4.6	0.088	-9	-9	-999	72	13.4	0.655	0.64	0.56	1.2	64	10	298.4	3	0	0	79	1010	3
5	12	28	362	19	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	55	10	297.4	3	0	0	85	1010	3
5	12	28	362	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	78	10	296.8	3	0	0	82	1011	0
5	12	28	362	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	296.4	3	0	0	79	1012	3
5	12	28	362	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	71	10	296	3	0	0	79	1011	3
5	12	28	362	23	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	77	10	295.8	3	0	0	82	1011	3
5	12	28	362	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	93	10	295.5	3	0	0	84	1011	3
5	12	29	363	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	95	10	295.2	3	0	0	90	1010	3
5	12	29	363	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	88	10	295	3	0	0	97	1009	0
5	12	29	363	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	294.8	3	0	0	93	1009	3
5	12	29	363	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	101	10	294.4	3	0	0	100	1009	3
5	12	29	363	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	91	10	294.4	3	0	0	97	1010	0
5	12	29	363	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	89	10	294.9	3	0	0	93	1010	3
5	12	29	363	7	-4.7	0.081	-9	-9	-999	53	10.1	0.655	0.64	0.71	1.1	68	10	297.9	3	0	0	100	1012	0
5	12	29	363	8	26.9	0.191	0.481	0.005	149	192	-23.3	0.655	0.64	0.32	1	68	10	298	3	0	0	90	1013	3
5	12	29	363	9	84.8	0.323	0.872	0.005	283	423	-36	0.655	0.64	0.22	1.8	75	10	300.2	3	0	0	79	1013	4
5	12	29	363	10	78.4	0.269	0.962	0.005	410	322	-22.4	0.655	0.64	0.19	1.4	84	10	300.6	3	0	0	69	1013	9
5	12	29	363	11	121.6	0.282	1.396	0.005	808	345	-16.7	0.655	0.64	0.18	1.4	75	10	302.6	3	0	0	67	1013	8
5	12	29	363	12	120.7	0.269	1.489	0.005	987	320	-14.5	0.655	0.64	0.18	1.3	81	10	303.5	3	0	0	51	1012	8
5	12	29	363	13	88.9	0.244	1.402	0.005	1119	277	-14.7	0.37	0.38	0.19	1.5	88	10	303.5	3	0	0	44	1010	8
5	12	29	363	14	58.4	0.248	1.248	0.005	1200	284	-23.6	0.655	0.64	0.18	1.3	29	10	301.8	3	0	0	77	1010	10
5	12	29	363	15	38.2	0.238	1.101	0.005	1257	267	-31.7	0.655	0.64	0.19	1.3	50	10	301.6	3	0	0	63	1009	10
5	12	29	363	16	8.7	0.185	0.673	0.005	1266	184	-65.7	0.655	0.64	0.21	1.1	58	10	300.5	3	0	0	63	1009	10
5	12	29	363	17	0.1	0.118	0.152	0.005	1263	95	-1496.4	0.655	0.64	0.28	0.8	62	10	299.6	3	0	0	72	1010	10
5	12	29	363	18	-1.9	0.061	-9	-9	-999	35	10.9	0.37	0.38	0.56	1	87	10	299.1	3	0	0	69	1010	7
5	12	29	363	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	70	10	298.4	3	0	0	74	1011	3
5	12	29	363	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	84	10	297.4	3	0	0	82	1011	7
5	12	29	363	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	296.5	3	0	0	84	1012	7
5	12	29	363	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	295.9	3	0	0	93	1012	7
5	12	29	363	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	114	10	295.5	3	0	0	93	1012	7
5	12	29	363	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	106	10	295.1	3	0	0	100	1011	3
5	12	30	364	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	112	10	295	3	0	0	100	1010	3
5	12	30	364	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	114	10	295	3	0	0	93	1010	7
5	12	30	364	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	105	10	295	3	0	0	100	1010	3
5	12	30	364	4	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	84	10	295.4	3	0	0	100	1010	3
5	12	30	364	5	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	104	10	295.9	3	0	0	93	1010	3
5	12	30	364	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	108	10	295.6	3	0	0	100	1011	3
5	12	30	364	7	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	0.73	0.9	107	10	296.9	3	0	0	100	1012	0
5	12	30	364	8	41.4	0.226	0.591	0.006	179	247	-25.2	0.37	0.38	0.33	1.5	101	10	300.8	3	0	0	85	1013	0
5	12	30	364	9	53.6	0.264	0.723	0.005	255	313	-31.1	0.37	0.38	0.22	1.8	97	10	301.5	3	0	0	72	1013	6
5	12	30	364	10	100.5	0.346	1.033	0.005	397	468	-37.2	0.37	0.38	0.2	2.4	106	10	302.9	3	0	0	67	1013	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
5	12	30	364	11	109.7	0.348	1.218	0.005	594	472	-34.7	0.37	0.38	0.19	2.4	93	10	303.5	3	0	0	61	1012	5
5	12	30	364	12	113.8	0.36	1.355	0.005	789	497	-37.1	0.37	0.38	0.19	2.5	101	10	303.4	3	0	0	58	1011	6
5	12	30	364	13	97.6	0.334	1.346	0.005	901	444	-34.4	0.37	0.38	0.19	2.3	95	10	303.4	3	0	0	55	1010	7
5	12	30	364	14	89.8	0.332	1.36	0.005	1009	440	-36.7	0.37	0.38	0.19	2.3	100	10	303.2	3	0	0	57	1009	7
5	12	30	364	15	59.1	0.321	1.209	0.005	1077	419	-50.4	0.37	0.38	0.19	2.3	103	10	302.4	3	0	0	59	1009	9
5	12	30	364	16	27	0.261	0.939	0.005	1107	308	-59.4	0.37	0.38	0.21	1.9	97	10	301.6	3	0	0	59	1010	9
5	12	30	364	17	2.6	0.201	0.429	0.005	1103	208	-285.3	0.37	0.38	0.28	1.6	97	10	299.2	3	0	0	61	1010	10
5	12	30	364	18	-2.5	0.073	-9	-9	-999	59	14.5	0.655	0.64	0.55	1	81	10	298	3	0	0	65	1010	7
5	12	30	364	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	297.4	3	0	0	74	1011	7
5	12	30	364	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	76	10	296.9	3	0	0	76	1012	7
5	12	30	364	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	102	10	296.1	3	0	0	79	1012	3
5	12	30	364	22	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	98	10	295.9	3	0	0	79	1012	3
5	12	30	364	23	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	108	10	295.6	3	0	0	79	1012	3
5	12	30	364	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	105	10	295.8	3	0	0	93	1012	3
5	12	31	365	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	96	10	295.6	3	0	0	93	1011	3
5	12	31	365	2	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	80	10	295.5	3	0	0	97	1010	3
5	12	31	365	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	91	10	295.9	3	0	0	93	1010	3
5	12	31	365	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	99	10	296.2	3	0	0	93	1010	3
5	12	31	365	5	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	102	10	295.4	3	0	0	93	1011	3
5	12	31	365	6	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	93	10	295.8	3	0	0	86	1012	0
5	12	31	365	7	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	0.72	0.8	80	10	296.9	3	0	0	79	1013	0
5	12	31	365	8	33.6	0.209	0.709	0.005	383	219	-24.4	0.655	0.64	0.32	1.1	74	10	299.4	3	0	0	69	1013	0
5	12	31	365	9	86.6	0.311	1.216	0.005	751	399	-31.4	0.655	0.64	0.22	1.7	82	10	301.8	3	0	0	68	1013	0
5	12	31	365	10	75.9	0.284	1.198	0.005	819	348	-27.1	0.37	0.38	0.2	1.9	88	10	302	3	0	0	67	1013	7
5	12	31	365	11	114.4	0.359	1.428	0.005	921	494	-36.4	0.655	0.64	0.18	2	85	10	302.5	3	0	0	61	1013	8
5	12	31	365	12	91.1	0.267	1.362	0.005	1003	321	-18.9	0.37	0.38	0.19	1.7	105	10	302.8	3	0	0	59	1012	8
5	12	31	365	13	82.5	0.297	1.351	0.005	1078	372	-28.5	0.37	0.38	0.19	2	91	10	303.1	3	0	0	57	1011	8
5	12	31	365	14	93.8	0.29	1.446	0.005	1163	358	-23.3	0.37	0.38	0.19	1.9	98	10	303.8	3	0	0	55	1010	7
5	12	31	365	15	49.4	0.263	1.256	0.005	1445	310	-33	0.37	0.38	0.19	1.8	101	10	303	3	0	0	59	1010	9
5	12	31	365	16	22.3	0.247	0.974	0.005	1493	282	-60.8	0.37	0.38	0.21	1.8	105	10	301.8	3	0	0	61	1010	10
5	12	31	365	17	0.7	0.173	0.314	0.005	1488	167	-621.2	0.37	0.38	0.28	1.4	92	10	300.4	3	0	0	63	1010	10
5	12	31	365	18	-1.5	0.049	-9	-9	-999	42	7	0.37	0.38	0.55	0.8	90	10	298.8	3	0	0	74	1010	3
5	12	31	365	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	297.9	3	0	0	79	1011	3
5	12	31	365	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	96	10	297.1	3	0	0	82	1012	3
5	12	31	365	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	76	10	296.9	3	0	0	84	1012	3
5	12	31	365	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	78	10	296.6	3	0	0	84	1012	3
5	12	31	365	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	70	10	296.2	3	0	0	93	1012	0
5	12	31	365	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	295.9	2	0	0	97	1010	3
6	1	1	1	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	296.1	3	0	0	97	1011	3
6	1	1	1	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	63	10	295.8	3	0	0	93	1010	0
6	1	1	1	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	295.4	3	0	0	93	1010	3
6	1	1	1	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	295.2	3	0	0	93	1010	3
6	1	1	1	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	295.4	3	0	0	93	1010	7
6	1	1	1	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	121	10	296	3	0	0	93	1010	3
6	1	1	1	7	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	0.74	0.6	87	10	299	3	0	0	93	1011	0
6	1	1	1	8	24.7	0.176	0.468	0.008	149	170	-19.9	0.655	0.64	0.32	0.9	85	10	299.6	3	0	0	90	1012	0
6	1	1	1	9	66.9	0.265	0.767	0.006	243	313	-25.1	0.655	0.64	0.22	1.4	70	10	301.4	3	0	0	74	1013	7
6	1	1	1	10	78.1	0.269	0.898	0.006	334	320	-22.4	0.655	0.64	0.19	1.4	75	10	300.4	3	0	0	88	1012	8
6	1	1	1	11	164.6	0.292	1.342	0.005	530	362	-13.6	0.655	0.64	0.18	1.4	64	10	303	3	0	0	67	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	1	1	12	126	0.336	1.532	0.005	1031	448	-27.2	0.655	0.64	0.18	1.8	70	10	303.4	3	0	0	68	1010	8
6	1	1	1	13	70.3	0.305	1.283	0.005	1083	388	-36.3	0.655	0.64	0.18	1.7	70	10	300.4	3	0	1.78	70	1010	9
6	1	1	1	14	69.9	0.318	1.302	0.005	1137	412	-41.4	0.655	0.64	0.18	1.8	66	10	299.9	3	0	0.51	82	1009	9
6	1	1	1	15	23.1	0.247	0.905	0.005	1154	285	-58.9	0.37	0.38	0.19	1.8	95	10	299.1	3	0	0	94	1009	10
6	1	1	1	16	10.4	0.236	0.695	0.005	1162	264	-113.9	0.37	0.38	0.21	1.8	89	10	299.1	3	0	0	88	1009	10
6	1	1	1	17	0.1	0.182	0.148	0.005	1161	180	-5460.8	0.37	0.38	0.28	1.5	89	10	298.6	3	0	0	91	1009	10
6	1	1	1	18	-5.1	0.134	-9	-9	-999	113	42.5	0.37	0.38	0.55	1.5	88	10	298.1	3	0	0	94	1010	7
6	1	1	1	19	-6.6	0.091	-9	-9	-999	63	10.3	0.37	0.38	1	1.5	86	10	297.9	3	0	0	94	1010	0
6	1	1	1	20	-7.4	0.103	-9	-9	-999	76	13.4	0.37	0.38	1	1.7	87	10	298	3	0	0	94	1011	7
6	1	1	1	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	87	10	297.9	3	0	0	94	1012	7
6	1	1	1	22	-5.5	0.088	-9	-9	-999	60	11.2	0.655	0.64	1	1.2	84	10	297.9	3	0	0	94	1012	3
6	1	1	1	23	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	96	10	297.6	3	0	0	94	1011	3
6	1	1	1	24	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	84	10	297.4	3	0	0	94	1011	3
6	1	2	2	1	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	84	10	297.1	3	0	0	94	1010	0
6	1	2	2	2	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	93	10	297.4	3	0	0	94	1010	7
6	1	2	2	3	-4.7	0.081	-9	-9	-999	53	10	0.655	0.64	1	1.1	84	10	297.5	3	0	0	91	1010	0
6	1	2	2	4	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	93	10	297.5	3	0	0	88	1010	7
6	1	2	2	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	297.5	3	0	0	88	1010	7
6	1	2	2	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	65	10	297.4	3	0	0	88	1011	7
6	1	2	2	7	-5.6	0.088	-9	-9	-999	60	11	0.655	0.64	0.73	1.2	67	10	299.2	3	0	0	88	1012	0
6	1	2	2	8	3.9	0.182	0.228	0.005	108	178	-137.6	0.37	0.38	0.33	1.4	110	10	298.2	3	0	7.87	91	1013	10
6	1	2	2	9	30.1	0.165	0.593	0.005	250	154	-13.5	0.37	0.38	0.22	1	121	10	298.4	3	0	0.76	94	1013	9
6	1	2	2	10	58.2	0.211	0.947	0.005	527	224	-14.7	0.37	0.38	0.2	1.3	110	10	300.9	3	0	0	82	1013	8
6	1	2	2	11	55.5	0.265	1.065	0.005	786	314	-30.3	0.37	0.38	0.19	1.8	115	10	301.9	3	0	0	84	1013	9
6	1	2	2	12	17.9	0.254	0.734	0.005	799	295	-83	0.37	0.38	0.19	1.9	99	10	297.8	3	0	8.38	86	1012	10
6	1	2	2	13	44.3	0.215	1.01	0.005	838	229	-20.1	0.655	0.64	0.18	1.1	65	10	298.8	3	0	0.76	88	1011	10
6	1	2	2	14	27.8	0.257	0.873	0.005	862	299	-54.9	0.655	0.64	0.18	1.5	66	10	298.4	3	0	0	94	1010	10
6	1	2	2	15	9.6	0.186	0.614	0.005	870	186	-60.8	0.655	0.64	0.18	1.1	82	10	298.1	3	0	0	88	1010	10
6	1	2	2	16	0.5	0.122	0.23	0.005	871	99	-324.7	0.655	0.64	0.2	0.8	64	10	298.1	3	0	0	88	1010	10
6	1	2	2	17	0.1	0.147	0.134	0.005	870	130	-2887.9	0.655	0.64	0.27	1	77	10	297.8	3	0	0	90	1010	10
6	1	2	2	18	-1.1	0.051	-9	-9	-999	33	11.1	0.655	0.64	0.54	0.7	81	10	297.4	3	0	0	94	1011	10
6	1	2	2	19	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	1	0.7	53	10	297	3	0	0	94	1011	10
6	1	2	2	20	-3.3	0.081	-9	-9	-999	53	14.2	0.655	0.64	1	1.1	73	10	297	3	0	0	93	1012	10
6	1	2	2	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	296.8	3	0	0	94	1012	7
6	1	2	2	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	116	10	296.9	3	0	0	94	1013	7
6	1	2	2	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	297.1	3	0	0	94	1013	7
6	1	2	2	24	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	66	10	296.9	3	0	0	88	1012	7
6	1	3	3	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	73	10	296.6	3	0	0	94	1012	7
6	1	3	3	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	63	10	296.6	3	0	0	97	1011	7
6	1	3	3	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	73	10	296.6	3	0	0	94	1011	7
6	1	3	3	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	66	10	296.5	3	0	0	94	1011	7
6	1	3	3	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.2	3	0	0	96	1011	7
6	1	3	3	6	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	69	10	296.5	3	0	0	98	1012	0
6	1	3	3	7	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	0.74	0.9	84	10	298.2	3	0	0	100	1012	0
6	1	3	3	8	50.4	0.283	0.606	0.006	159	346	-40.7	0.655	0.64	0.32	1.6	82	10	300.8	3	0	0	91	1013	0
6	1	3	3	9	81.5	0.335	0.851	0.005	273	446	-41.7	0.655	0.64	0.22	1.9	85	10	301.9	3	0	0	74	1013	0
6	1	3	3	10	74.9	0.283	0.922	0.006	378	348	-27.4	0.37	0.38	0.2	1.9	87	10	302.8	3	0	0	75	1013	7
6	1	3	3	11	70.7	0.315	0.977	0.005	477	406	-39.8	0.37	0.38	0.19	2.2	88	10	302.4	3	0	0	77	1013	8
6	1	3	3	12	122.1	0.374	1.3	0.005	649	526	-38.6	0.655	0.64	0.18	2.1	84	10	302.9	3	0	0	70	1012	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	3	3	13	101.2	0.324	1.364	0.006	906	425	-30.3	0.37	0.38	0.19	2.2	91	10	303	3	0	0	65	1011	7
6	1	3	3	14	50.5	0.296	1.14	0.007	1057	370	-46.1	0.37	0.38	0.19	2.1	104	10	301.8	3	0	0	70	1010	9
6	1	3	3	15	44.1	0.293	1.115	0.007	1132	364	-51.2	0.37	0.38	0.19	2.1	92	10	302	3	0	0	72	1009	9
6	1	3	3	16	7.2	0.232	0.609	0.007	1133	258	-156.4	0.37	0.38	0.21	1.8	103	10	300.4	3	0	0	74	1009	10
6	1	3	3	17	0.1	0.162	0.147	0.007	1133	151	-3828.2	0.655	0.64	0.27	1.1	82	10	299.4	3	0	0	82	1010	10
6	1	3	3	18	-2.8	0.09	-9	-9	-999	64	23.2	0.655	0.64	0.53	1.1	83	10	298.8	3	0	0	94	1010	7
6	1	3	3	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	74	10	298	3	0	0	94	1010	7
6	1	3	3	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	89	10	298.1	3	0	0	91	1011	0
6	1	3	3	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	69	10	297.9	3	0	0	88	1012	7
6	1	3	3	22	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	89	10	297.5	3	0	0	88	1012	7
6	1	3	3	23	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	27	10	297.1	3	0	0	90	1011	0
6	1	3	3	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	40	10	296.9	3	0	0	94	1010	7
6	1	4	4	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	65	10	296.6	3	0	0	88	1010	7
6	1	4	4	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	48	10	296.4	3	0	0	90	1009	7
6	1	4	4	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	296.4	3	0	0	94	1009	3
6	1	4	4	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	57	10	296.4	3	0	0	94	1009	3
6	1	4	4	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	69	10	296.4	3	0	0	97	1010	0
6	1	4	4	6	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	76	10	296.6	3	0	0	98	1010	0
6	1	4	4	7	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	0.75	0.8	87	10	298.8	3	0	0	100	1011	0
6	1	4	4	8	25.2	0.162	0.451	0.006	131	150	-15.2	0.37	0.38	0.33	1	88	10	300	3	0	0	85	1012	0
6	1	4	4	9	57.9	0.245	0.723	0.006	235	278	-22.8	0.37	0.38	0.23	1.6	117	10	301.6	3	0	0	88	1012	3
6	1	4	4	10	68.2	0.37	0.876	0.005	355	517	-67	0.736	0.77	0.19	2.1	140	10	298.5	3	0	2.79	79	1013	9
6	1	4	4	11	53.1	0.286	0.871	0.005	450	355	-39.8	0.37	0.38	0.19	2	139	10	298.5	3	0	0	94	1012	9
6	1	4	4	12	53.3	0.286	0.931	0.005	545	352	-39.7	0.37	0.38	0.19	2	115	10	298.8	3	0	0	94	1011	9
6	1	4	4	13	74.9	0.281	1.122	0.005	680	343	-26.7	0.655	0.64	0.18	1.5	77	10	298.8	3	0	0.51	100	1010	9
6	1	4	4	14	48	0.216	1.005	0.005	763	233	-19	0.655	0.64	0.18	1.1	46	10	299	3	0	0	97	1009	10
6	1	4	4	15	31.4	0.194	0.9	0.005	837	197	-20.9	0.655	0.64	0.18	1	47	10	298.8	3	0	0.25	94	1009	10
6	1	4	4	16	13.9	0.196	0.691	0.005	853	200	-48.8	0.37	0.38	0.21	1.4	88	10	298.6	3	0	0	94	1009	10
6	1	4	4	17	0.1	0.158	0.134	0.005	852	145	-3564.5	0.37	0.38	0.28	1.3	125	10	298	3	0	0	94	1009	10
6	1	4	4	18	-2.2	0.061	-9	-9	-999	40	9.4	0.736	0.77	0.53	0.8	164	10	297.5	3	0	0	94	1009	0
6	1	4	4	19	-1.8	0.054	-9	-9	-999	29	7.8	0.736	0.77	1	0.7	146	10	297	3	0	0	94	1009	7
6	1	4	4	20	-1.3	0.046	-9	-9	-999	23	6.7	0.736	0.77	1	0.6	143	10	296.9	3	0	0	97	1009	7
6	1	4	4	21	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	110	10	296.6	3	0	0	94	1010	7
6	1	4	4	22	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	82	10	296.5	3	0	0	97	1010	0
6	1	4	4	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	65	10	296.6	3	0	0	100	1010	0
6	1	4	4	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	73	10	296.8	3	0	0	94	1009	7
6	1	5	5	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	82	10	296.8	3	0	0	100	1009	7
6	1	5	5	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	61	10	296.8	3	0	0	100	1009	7
6	1	5	5	3	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	60	10	296.6	3	0	0	99	1008	0
6	1	5	5	4	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	82	10	296.8	3	0	0	98	1008	0
6	1	5	5	5	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	87	10	296.6	3	0	0	97	1009	7
6	1	5	5	6	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	82	10	296.6	3	0	0	97	1009	3
6	1	5	5	7	-5.6	0.088	-9	-9	-999	60	11	0.655	0.64	0.75	1.2	81	10	297.6	3	0	0	97	1010	0
6	1	5	5	8	39.8	0.236	0.592	0.005	188	264	-29.8	0.37	0.38	0.33	1.6	89	10	300.6	3	0	0	90	1012	0
6	1	5	5	9	76.8	0.273	0.937	0.005	387	328	-23.9	0.37	0.38	0.23	1.8	88	10	302	3	0	0	74	1012	0
6	1	5	5	10	114.6	0.346	1.295	0.005	684	467	-32.5	0.655	0.64	0.19	1.9	85	10	302.2	3	0	0	74	1011	6
6	1	5	5	11	110.8	0.294	1.382	0.005	859	368	-20.7	0.37	0.38	0.19	1.9	99	10	303.1	3	0	0	63	1010	5
6	1	5	5	12	111.6	0.261	1.445	0.005	974	307	-14.4	0.37	0.38	0.19	1.6	102	10	304.1	3	0	0	55	1010	6
6	1	5	5	13	101.7	0.247	1.432	0.005	1040	283	-13.4	0.37	0.38	0.19	1.5	104	10	304.2	3	0	0	67	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	5	5	14	34.9	0.19	1.009	0.005	1061	191	-17.7	0.37	0.38	0.19	1.2	93	10	303.1	3	0	0	61	1008	10
6	1	5	5	15	8.8	-9	-9	-9	1064	-999	-99999	0.542	0.56	0.17	0	0	10	301.4	3	0	0	999	1008	10
6	1	5	5	16	1.5	-9	-9	-9	1064	-999	-99999	0.542	0.56	0.19	0	0	10	300.4	3	0	0	999	1008	10
6	1	5	5	17	0.1	0.122	0.144	0.005	1063	98	-1639.8	0.37	0.38	0.28	1	114	10	299.6	3	0	0	999	1008	10
6	1	5	5	18	-3.2	0.073	-9	-9	-999	46	11.2	0.655	0.64	0.52	1	82	10	298.9	3	0	0	999	1009	0
6	1	5	5	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	72	10	297.8	3	0	0	85	1009	7
6	1	5	5	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	296.8	3	0	0	87	1010	7
6	1	5	5	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	296.4	3	0	0	90	1010	7
6	1	5	5	22	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	116	10	295.9	3	0	0	97	1010	7
6	1	5	5	23	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	84	10	295.8	3	0	0	93	1010	0
6	1	5	5	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	100	10	295.2	3	0	0	93	1010	7
6	1	6	6	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	114	10	294.9	3	0	0	100	1010	7
6	1	6	6	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	110	10	294.8	3	0	0	100	1009	0
6	1	6	6	3	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	294.4	3	0	0	100	1009	7
6	1	6	6	4	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	105	10	294.2	3	0	0	93	1009	7
6	1	6	6	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	294.1	3	0	0	93	1010	7
6	1	6	6	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	294.4	3	0	0	93	1010	7
6	1	6	6	7	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	0.76	0.9	88	10	297.4	3	0	0	93	1012	0
6	1	6	6	8	54.1	0.22	0.572	0.005	125	237	-17.7	0.655	0.64	0.33	1.1	78	10	299.9	3	0	0	84	1012	0
6	1	6	6	9	107.2	0.305	1.035	0.005	374	387	-23.9	0.655	0.64	0.22	1.6	85	10	301.9	3	0	0	72	1013	0
6	1	6	6	10	96.6	0.279	1.17	0.005	599	340	-20.4	0.37	0.38	0.2	1.8	92	10	302.8	3	0	0	64	1013	0
6	1	6	6	11	107.2	0.293	1.335	0.005	802	365	-21.2	0.37	0.38	0.19	1.9	103	10	303.4	3	0	0	57	1012	6
6	1	6	6	12	125.3	0.298	1.468	0.005	911	374	-19	0.37	0.38	0.19	1.9	110	10	304.1	3	0	0	56	1011	5
6	1	6	6	13	77.5	0.295	1.28	0.005	976	369	-29.9	0.37	0.38	0.19	2	113	10	303.1	3	0	0	55	1010	8
6	1	6	6	14	79.9	0.264	1.324	0.006	1046	312	-20.6	0.37	0.38	0.19	1.7	103	10	303.4	3	0	0	55	1009	8
6	1	6	6	15	46.9	0.261	1.123	0.006	1085	307	-34.3	0.37	0.38	0.19	1.8	105	10	302.9	3	0	0	59	1009	9
6	1	6	6	16	13.6	0.228	0.745	0.006	1094	251	-78.7	0.37	0.38	0.21	1.7	104	10	301.2	3	0	0	63	1009	10
6	1	6	6	17	0.1	0.17	0.145	0.006	1090	162	-4446.3	0.37	0.38	0.28	1.4	96	10	299.4	3	0	0	67	1009	10
6	1	6	6	18	-1.9	0.055	-9	-9	-999	41	7.6	0.37	0.38	0.53	0.9	99	10	298.4	3	0	0	72	1010	0
6	1	6	6	19	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	76	10	297.6	3	0	0	77	1010	0
6	1	6	6	20	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	81	10	297.1	3	0	0	82	1011	0
6	1	6	6	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	296.6	3	0	0	79	1012	7
6	1	6	6	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	110	10	296.4	3	0	0	79	1012	7
6	1	6	6	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	296.4	3	0	0	84	1012	7
6	1	6	6	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	296.2	3	0	0	84	1012	7
6	1	7	7	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	296.4	3	0	0	90	1011	7
6	1	7	7	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	296.4	3	0	0	90	1010	7
6	1	7	7	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	69	10	295.9	3	0	0	93	1010	7
6	1	7	7	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	81	10	295.4	3	0	0	93	1011	7
6	1	7	7	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	88	10	295.2	3	0	0	97	1011	0
6	1	7	7	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	295.4	3	0	0	100	1012	7
6	1	7	7	7	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	0.76	0.9	82	10	297.8	3	0	0	93	1013	0
6	1	7	7	8	37.9	0.224	0.664	0.005	279	245	-27	0.655	0.64	0.33	1.2	82	10	300.1	3	0	0	77	1014	0
6	1	7	7	9	78.7	0.321	1.118	0.005	643	418	-38	0.655	0.64	0.22	1.8	84	10	301.4	3	0	0	63	1014	6
6	1	7	7	10	116.5	0.321	1.46	0.006	968	417	-25.6	0.655	0.64	0.19	1.7	70	10	302.5	3	0	0	59	1014	6
6	1	7	7	11	101	0.258	1.452	0.006	1096	303	-15.4	0.37	0.38	0.19	1.6	86	10	303.5	3	0	0	55	1013	6
6	1	7	7	12	110.3	0.261	1.535	0.006	1184	306	-14.5	0.37	0.38	0.19	1.6	97	10	303.9	3	0	0	52	1012	7
6	1	7	7	13	95.3	0.257	1.479	0.006	1226	299	-16	0.37	0.38	0.19	1.6	100	10	303.8	3	0	0	54	1011	8
6	1	7	7	14	72.5	0.272	1.362	0.005	1257	325	-24.9	0.37	0.38	0.19	1.8	105	10	303.2	3	0	0	57	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	7	7	15	34.4	0.244	1.066	0.005	1271	278	-38.2	0.37	0.38	0.19	1.7	105	10	302.4	3	0	0	55	1010	10
6	1	7	7	16	6.2	0.197	0.603	0.005	1272	202	-111.3	0.37	0.38	0.21	1.5	105	10	300.9	3	0	0	55	1010	10
6	1	7	7	17	0.1	0.146	0.152	0.005	1271	129	-2816.1	0.37	0.38	0.27	1.2	105	10	299.8	3	0	0	59	1011	10
6	1	7	7	18	-2.5	0.067	-9	-9	-999	42	10.8	0.37	0.38	0.52	1.1	110	10	298.5	3	0	0	69	1011	3
6	1	7	7	19	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	96	10	297.6	3	0	0	79	1012	7
6	1	7	7	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	98	10	296.8	3	0	0	74	1013	0
6	1	7	7	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	116	10	296.1	3	0	0	79	1013	3
6	1	7	7	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	295.9	3	0	0	84	1013	3
6	1	7	7	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	295.9	3	0	0	84	1013	3
6	1	7	7	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	120	10	295.1	3	0	0	93	1013	3
6	1	8	8	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	104	10	294.9	3	0	0	93	1012	3
6	1	8	8	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	294.6	3	0	0	93	1012	3
6	1	8	8	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	294.5	3	0	0	93	1011	3
6	1	8	8	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	102	10	294.4	3	0	0	100	1012	3
6	1	8	8	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	75	10	294.4	3	0	0	93	1012	0
6	1	8	8	6	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	89	10	295.2	3	0	0	89	1013	0
6	1	8	8	7	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	0.76	1	76	10	298.2	3	0	0	85	1014	0
6	1	8	8	8	54.1	0.259	0.651	0.005	184	303	-29.1	0.655	0.64	0.33	1.4	76	10	300.4	3	0	0	82	1015	0
6	1	8	8	9	70.1	0.266	0.842	0.005	308	316	-24.3	0.655	0.64	0.22	1.4	55	10	301	3	0	0	69	1015	7
6	1	8	8	10	118.3	0.281	1.209	0.005	541	343	-17	0.655	0.64	0.19	1.4	70	10	302.4	3	0	0	63	1015	6
6	1	8	8	11	125.5	0.296	1.432	0.005	848	370	-18.7	0.655	0.64	0.18	1.5	68	10	303.2	3	0	0	57	1014	7
6	1	8	8	12	135	0.285	1.607	0.005	1112	351	-15.6	0.655	0.64	0.18	1.4	66	10	303.4	3	0	0	67	1014	8
6	1	8	8	13	53.1	0.324	1.212	0.005	1212	424	-57.6	0.655	0.64	0.18	1.9	73	10	301.9	3	0	0	59	1013	10
6	1	8	8	14	34.8	0.275	1.072	0.006	1279	332	-53.7	0.655	0.64	0.18	1.6	74	10	301.4	3	0	0	55	1012	10
6	1	8	8	15	23.8	0.228	0.956	0.007	1325	250	-44.7	0.655	0.64	0.18	1.3	79	10	301.4	3	0	0	67	1012	10
6	1	8	8	16	10.4	0.188	0.73	0.007	1342	187	-57.1	0.655	0.64	0.2	1.1	66	10	300.4	3	0	0	63	1012	10
6	1	8	8	17	0.1	0.147	0.155	0.007	1337	130	-2891.7	0.655	0.64	0.27	1	24	10	299.1	3	0	0	65	1012	10
6	1	8	8	18	-1.1	0.059	-9	-9	-999	37	17.1	0.655	0.64	0.51	0.8	41	10	298.6	3	0	0	69	1012	7
6	1	8	8	19	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	39	10	297.9	3	0	0	74	1013	7
6	1	8	8	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	297.4	3	0	0	79	1014	7
6	1	8	8	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	87	10	297	3	0	0	90	1014	3
6	1	8	8	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	114	10	296.6	3	0	0	74	1014	3
6	1	8	8	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	296.4	3	0	0	87	1014	7
6	1	8	8	24	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	110	10	296.4	3	0	0	97	1013	3
6	1	9	9	1	-5.6	0.085	-9	-9	-999	57	9.8	0.37	0.38	1	1.4	88	10	296.4	3	0	0	90	1013	3
6	1	9	9	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	296.1	3	0	0	90	1012	7
6	1	9	9	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	102	10	295.9	3	0	0	84	1012	3
6	1	9	9	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	89	10	295.9	3	0	0	90	1011	7
6	1	9	9	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	295.8	3	0	0	93	1012	7
6	1	9	9	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	295.8	3	0	0	90	1012	7
6	1	9	9	7	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	74	10	297.1	3	0	0	79	1014	3
6	1	9	9	8	30.1	0.219	0.528	0.005	177	236	-31.8	0.655	0.64	0.33	1.2	68	10	299.5	3	0	0	72	1014	0
6	1	9	9	9	91.6	0.365	1.268	0.005	805	507	-48	0.655	0.64	0.22	2.1	81	10	301.9	3	0	0	999	1014	0
6	1	9	9	10	105.9	0.356	1.401	0.005	940	489	-38.6	0.655	0.64	0.19	2	85	10	302.5	3	0	0	999	1014	7
6	1	9	9	11	120.8	0.329	1.54	0.005	1096	435	-26.7	0.37	0.38	0.19	2.2	96	10	303.9	3	0	0	999	1014	0
6	1	9	9	12	109.1	0.305	1.551	0.006	1236	387	-23.4	0.37	0.38	0.19	2	103	10	304	3	0	0	999	1013	7
6	1	9	9	13	102.9	0.303	1.574	0.007	1369	383	-24.3	0.37	0.38	0.19	2	103	10	304	3	0	0	999	1012	7
6	1	9	9	14	78.7	0.328	1.474	0.008	1469	433	-40.5	0.37	0.38	0.19	2.3	104	10	303.4	3	0	0	999	1011	8
6	1	9	9	15	46.3	0.305	1.25	0.009	1522	387	-55.1	0.37	0.38	0.19	2.2	105	10	301.1	3	0	0	999	1011	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	9	9	16	27.1	0.283	1.051	0.009	1547	346	-75.4	0.37	0.38	0.21	2.1	101	10	301.4	3	0	0	999	1011	10
6	1	9	9	17	4.2	0.204	0.564	0.009	1548	215	-185	0.37	0.38	0.27	1.6	103	10	300.4	3	0	0	999	1011	10
6	1	9	9	18	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	0.51	1.1	90	10	298.9	3	0	0	999	1012	99
6	1	9	9	19	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	1	86	10	297.9	3	0	0	999	1012	99
6	1	9	9	20	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	72	10	297.1	3	0	0	85	1013	0
6	1	9	9	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	83	10	296.6	3	0	0	84	1013	3
6	1	9	9	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	111	10	296.2	3	0	0	84	1013	3
6	1	9	9	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	121	10	296	3	0	0	84	1013	0
6	1	9	9	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	296	3	0	0	84	1012	3
6	1	10	10	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	106	10	295.5	3	0	0	84	1012	3
6	1	10	10	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	86	10	295.5	3	0	0	90	1011	0
6	1	10	10	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	92	10	295.8	3	0	0	90	1011	3
6	1	10	10	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	102	10	295.6	3	0	0	90	1011	3
6	1	10	10	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	295.8	3	0	0	97	1012	3
6	1	10	10	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	295.6	3	0	0	97	1012	3
6	1	10	10	7	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	78	10	298.2	3	0	0	97	1013	3
6	1	10	10	8	54.2	0.259	0.678	0.005	208	303	-29	0.655	0.64	0.33	1.4	83	10	300.8	3	0	0	79	1014	0
6	1	10	10	9	73.2	0.294	0.91	0.005	372	366	-31.2	0.37	0.38	0.23	2	94	10	302.1	3	0	0	72	1014	0
6	1	10	10	10	89.3	0.299	1.123	0.005	573	375	-27	0.37	0.38	0.2	2	104	10	302.9	3	0	0	67	1014	0
6	1	10	10	11	123.3	0.33	1.406	0.005	815	435	-26.3	0.37	0.38	0.19	2.2	108	10	304	3	0	0	59	1013	0
6	1	10	10	12	126.5	0.33	1.467	0.005	903	437	-25.8	0.37	0.38	0.19	2.2	106	10	304	3	0	0	57	1013	4
6	1	10	10	13	97.6	0.312	1.379	0.005	970	401	-28.1	0.37	0.38	0.19	2.1	87	10	303.2	3	0	0	55	1012	8
6	1	10	10	14	98.9	0.323	1.418	0.005	1040	423	-30.8	0.37	0.38	0.19	2.2	96	10	303.9	3	0	0	56	1011	7
6	1	10	10	15	72.2	0.293	1.297	0.005	1091	366	-31.5	0.37	0.38	0.19	2	93	10	303.9	3	0	0	57	1010	8
6	1	10	10	16	39.8	0.28	1.072	0.005	1116	340	-49.6	0.37	0.38	0.21	2	98	10	302.8	3	0	0	59	1010	9
6	1	10	10	17	3	0.225	0.452	0.005	1114	246	-343.4	0.37	0.38	0.27	1.8	95	10	300.1	3	0	0	69	1011	10
6	1	10	10	18	-2.7	0.073	-9	-9	-999	69	12.7	0.37	0.38	0.51	1.2	89	10	298.6	3	0	0	79	1011	3
6	1	10	10	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	82	10	297.8	3	0	0	79	1011	3
6	1	10	10	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	87	10	297.4	3	0	0	85	1012	0
6	1	10	10	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	77	10	296.9	3	0	0	90	1013	3
6	1	10	10	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	296.6	3	0	0	94	1013	3
6	1	10	10	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	296.5	3	0	0	93	1012	3
6	1	10	10	24	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	62	10	296.1	3	0	0	97	1012	3
6	1	11	11	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	69	10	296	3	0	0	100	1011	7
6	1	11	11	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	295.9	3	0	0	93	1011	7
6	1	11	11	3	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	101	10	296.1	3	0	0.76	97	1011	3
6	1	11	11	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	296	3	0	0.25	97	1011	3
6	1	11	11	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	132	10	296.1	3	0	0	93	1011	7
6	1	11	11	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	138	10	296.4	3	0	0	97	1012	3
6	1	11	11	7	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	123	10	297	3	0	0	100	1012	3
6	1	11	11	8	16	0.165	0.311	0.005	68	155	-25.6	0.37	0.38	0.34	1.1	114	10	298.4	3	0	0	93	1013	6
6	1	11	11	9	59.6	0.223	0.758	0.005	264	243	-16.9	0.37	0.38	0.23	1.4	97	10	301	3	0	0	82	1013	0
6	1	11	11	10	107.4	0.318	1.233	0.005	631	412	-27	0.655	0.64	0.19	1.7	73	10	301.9	3	0	0	77	1013	7
6	1	11	11	11	99.9	0.324	1.351	0.005	892	423	-30.6	0.37	0.38	0.19	2.2	87	10	300.5	3	0	0	74	1013	6
6	1	11	11	12	105	0.33	1.47	0.007	1094	436	-31	0.655	0.64	0.18	1.8	83	10	301	3	0	0.25	94	1012	9
6	1	11	11	13	61.1	0.246	1.263	0.009	1188	283	-21.9	0.37	0.38	0.19	1.6	101	10	299.5	3	0	0.76	85	1011	9
6	1	11	11	14	47.3	0.273	1.165	0.009	1205	327	-38.6	0.37	0.38	0.19	1.9	96	10	299.8	3	0	2.79	91	1010	9
6	1	11	11	15	37.2	0.202	1.079	0.009	1217	211	-20.1	0.37	0.38	0.19	1.3	92	10	299.9	3	0	0	94	1010	10
6	1	11	11	16	20.3	0.264	0.883	0.009	1224	311	-81.3	0.655	0.64	0.2	1.6	82	10	299	3	0	0	97	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	11	11	17	0.1	0.162	0.151	0.009	1223	154	-3829.5	0.655	0.64	0.26	1.1	72	10	297.9	3	0	0	90	1010	10
6	1	11	11	18	-2.5	0.073	-9	-9	-999	49	14.2	0.655	0.64	0.5	1	66	10	297.1	3	0	0	94	1010	3
6	1	11	11	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	67	10	296.8	3	0	0	94	1011	7
6	1	11	11	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	64	10	296.6	3	0	0	90	1011	7
6	1	11	11	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	68	10	296.6	3	0	0	94	1012	3
6	1	11	11	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	80	10	296.5	3	0	0	94	1012	3
6	1	11	11	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	296.4	3	0	0	94	1012	3
6	1	11	11	24	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	81	10	296.4	3	0	0	94	1011	0
6	1	12	12	1	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	66	10	296.5	3	0	0	94	1010	0
6	1	12	12	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	296.4	3	0	0	94	1010	3
6	1	12	12	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	296.5	3	0	0.51	97	1010	3
6	1	12	12	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	296.4	3	0	0	100	1010	7
6	1	12	12	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	79	10	296.4	3	0	0	100	1010	7
6	1	12	12	6	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	69	10	296.2	3	0	0	97	1011	0
6	1	12	12	7	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	142	10	296.8	3	0	5.33	94	1012	7
6	1	12	12	8	15	0.186	0.372	0.006	123	185	-38.9	0.37	0.38	0.34	1.3	131	10	297.9	3	0	2.54	85	1012	7
6	1	12	12	9	46.2	0.291	0.666	0.005	230	362	-48.4	0.736	0.77	0.22	1.6	149	10	298.2	3	0	4.06	82	1013	9
6	1	12	12	10	78.8	0.207	0.968	0.005	416	220	-10.2	0.37	0.38	0.2	1.2	107	10	300	3	0	0.25	77	1013	6
6	1	12	12	11	93.9	0.268	1.15	0.005	585	319	-18.5	0.37	0.38	0.19	1.7	110	10	301.1	3	0	1.52	79	1012	7
6	1	12	12	12	83.2	0.308	1.222	0.005	791	393	-31.6	0.37	0.38	0.19	2.1	115	10	301.9	3	0	0.76	88	1011	8
6	1	12	12	13	50	0.23	1.061	0.005	861	256	-22	0.37	0.38	0.19	1.5	118	10	299.9	3	0	4.57	85	1010	9
6	1	12	12	14	32.1	0.221	0.932	0.005	907	239	-30.3	0.37	0.38	0.19	1.5	118	10	299.1	3	0	2.79	82	1010	10
6	1	12	12	15	20.9	0.203	0.817	0.005	938	210	-35.8	0.37	0.38	0.19	1.4	104	10	299.6	3	0	0	88	1009	10
6	1	12	12	16	37.6	0.268	1.012	0.005	994	319	-45.9	0.37	0.38	0.21	1.9	103	10	300.1	3	0	0.76	85	1009	9
6	1	12	12	17	2.6	0.19	0.415	0.005	995	192	-237.8	0.37	0.38	0.27	1.5	106	10	298.9	3	0	0.25	82	1010	10
6	1	12	12	18	-1.8	0.061	-9	-9	-999	51	11.1	0.37	0.38	0.5	1	90	10	297.9	3	0	0	88	1010	3
6	1	12	12	19	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	90	10	297.4	3	0	0	94	1011	3
6	1	12	12	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	92	10	297.4	3	0	0	94	1011	3
6	1	12	12	21	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	98	10	297.4	3	0	0	88	1012	3
6	1	12	12	22	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	99	10	297.6	3	0	0	94	1012	3
6	1	12	12	23	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	99	10	297.8	3	0	0	94	1012	3
6	1	12	12	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	130	10	297.5	3	0	0.51	94	1012	3
6	1	13	13	1	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	112	10	297.5	3	0	0	94	1011	0
6	1	13	13	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	112	10	296.9	3	0	0.25	94	1010	7
6	1	13	13	3	-3.6	0.067	-9	-9	-999	40	7.5	0.37	0.38	1	1.1	119	10	296.6	3	0	7.11	94	1010	0
6	1	13	13	4	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	118	10	296.4	3	0	2.79	94	1010	0
6	1	13	13	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	139	10	296.5	3	0	0.51	94	1011	7
6	1	13	13	6	-4.4	0.084	-9	-9	-999	56	12.3	0.736	0.77	1	1.1	182	10	296.5	3	0	13.72	100	1012	7
6	1	13	13	7	-6	0.092	-9	-9	-999	64	11.7	0.736	0.77	1	1.2	171	10	296.4	3	0	21.08	97	1013	0
6	1	13	13	8	6.1	0.142	0.106	0.005	7	123	-42.3	0.37	0.38	0.34	1	130	10	296.9	3	0	1.52	94	1013	9
6	1	13	13	9	19.3	0.201	0.249	0.005	29	208	-38.2	0.37	0.38	0.23	1.4	139	10	297.9	3	0	1.02	100	1014	10
6	1	13	13	10	33.9	0.265	0.398	0.005	67	315	-49.9	0.37	0.38	0.2	1.9	124	10	298.1	3	0	1.78	94	1014	10
6	1	13	13	11	48.2	0.23	0.547	0.005	122	253	-22.7	0.37	0.38	0.19	1.5	139	10	298.9	3	0	0.51	91	1013	9
6	1	13	13	12	35	0.326	0.539	0.005	162	428	-89.1	0.736	0.77	0.18	1.9	140	10	298.4	3	0	1.02	94	1013	10
6	1	13	13	13	25.4	0.173	0.512	0.005	190	180	-18.5	0.37	0.38	0.19	1.1	112	10	297.8	3	0	0.76	94	1012	10
6	1	13	13	14	28.2	0.164	0.559	0.005	223	152	-14.1	0.37	0.38	0.19	1	132	10	298.5	3	0	0.25	85	1011	10
6	1	13	13	15	29.4	0.197	0.595	0.005	257	202	-23.6	0.37	0.38	0.19	1.3	106	10	299.1	3	0	0	94	1010	10
6	1	13	13	16	20.3	0.224	0.541	0.005	281	243	-49.6	0.37	0.38	0.21	1.6	122	10	299.4	3	0	0.25	94	1010	10
6	1	13	13	17	4.9	0.172	0.338	0.005	286	165	-95	0.37	0.38	0.27	1.3	116	10	298.9	3	0	0	91	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	13	13	18	-2.5	0.073	-9	-9	-999	50	13.8	0.37	0.38	0.5	1.2	130	10	298.1	3	0	0.51	88	1010	3
6	1	13	13	19	-3.6	0.067	-9	-9	-999	40	7.5	0.37	0.38	1	1.1	111	10	297.8	3	0	0.25	92	1011	0
6	1	13	13	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	77	10	297.4	3	0	0	97	1012	7
6	1	13	13	21	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	79	10	297	3	0	0	98	1012	0
6	1	13	13	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	58	10	296.9	3	0	0.25	100	1012	3
6	1	13	13	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	296.9	3	0	0	94	1012	7
6	1	13	13	24	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	92	10	296.9	3	0	0	94	1012	0
6	1	14	14	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	136	10	297	3	0	0	94	1011	3
6	1	14	14	2	-4.3	0.079	-9	-9	-999	51	10.2	0.37	0.38	1	1.3	104	10	296.9	3	0	0.51	97	1010	7
6	1	14	14	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	102	10	296.8	3	0	0	94	1010	3
6	1	14	14	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	296.6	3	0	0	94	1010	7
6	1	14	14	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	89	10	296.6	3	0	0.25	97	1010	7
6	1	14	14	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	106	10	296.8	3	0	0	94	1011	7
6	1	14	14	7	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	112	10	298.4	3	0	0	94	1012	3
6	1	14	14	8	36.2	0.245	0.555	0.005	171	279	-36.8	0.37	0.38	0.34	1.7	108	10	300.6	3	0	0	85	1013	0
6	1	14	14	9	68.3	0.314	0.86	0.005	336	404	-40.9	0.37	0.38	0.23	2.2	104	10	301.9	3	0	0	77	1013	0
6	1	14	14	10	74.8	0.305	1.023	0.006	517	387	-34.3	0.37	0.38	0.2	2.1	101	10	302.4	3	0	0	70	1013	7
6	1	14	14	11	78.3	0.317	1.154	0.006	708	411	-36.8	0.37	0.38	0.19	2.2	102	10	302.8	3	0	0	61	1013	8
6	1	14	14	12	58.3	0.332	1.089	0.006	800	439	-56.4	0.37	0.38	0.19	2.4	115	10	302	3	0	0	67	1012	9
6	1	14	14	13	35.5	0.256	0.931	0.005	821	299	-42.5	0.37	0.38	0.19	1.8	113	10	301.4	3	0	0	67	1011	10
6	1	14	14	14	46.7	0.272	1.032	0.005	849	327	-39	0.37	0.38	0.19	1.9	110	10	301.4	3	0	0	72	1010	10
6	1	14	14	15	45.3	0.272	1.033	0.005	876	326	-39.9	0.37	0.38	0.19	1.9	104	10	301.9	3	0	0	72	1010	9
6	1	14	14	16	16	0.242	0.732	0.005	885	273	-79.5	0.37	0.38	0.21	1.8	116	10	300.9	3	0	0	72	1010	10
6	1	14	14	17	1.8	0.188	0.355	0.005	885	188	-327.8	0.37	0.38	0.27	1.5	102	10	299.9	3	0	0	72	1010	10
6	1	14	14	18	-0.3	0.118	-9	-9	-999	94	537.9	0.37	0.38	0.5	1	97	10	298.9	3	0	0	77	1010	7
6	1	14	14	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	298.4	3	0	0	82	1011	7
6	1	14	14	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	297.9	3	0	0	85	1012	7
6	1	14	14	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	42	10	297.2	3	0	0	88	1012	7
6	1	14	14	22	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	70	10	296.9	3	0	0	90	1012	0
6	1	14	14	23	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.6	71	10	296.6	3	0	0	92	1012	99
6	1	14	14	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	77	10	296.6	3	0	0	94	1012	3
6	1	15	15	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	70	10	296.4	3	0	0	100	1011	3
6	1	15	15	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	74	10	296.1	3	0	0	97	1010	0
6	1	15	15	3	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	64	10	296	3	0	0	97	1009	3
6	1	15	15	4	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	79	10	295.9	3	0	0	100	1010	3
6	1	15	15	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	94	10	295.6	3	0	0	97	1010	0
6	1	15	15	6	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	82	10	295.9	3	0	0	100	1010	3
6	1	15	15	7	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	86	10	298.5	3	0	0	100	1011	3
6	1	15	15	8	53.9	0.246	0.737	0.005	267	281	-24.9	0.655	0.64	0.33	1.3	76	10	300.9	3	0	0	87	1012	0
6	1	15	15	9	75.6	0.273	0.988	0.005	461	327	-24.2	0.37	0.38	0.23	1.8	88	10	302.4	3	0	0	72	1012	0
6	1	15	15	10	98.1	0.28	1.216	0.005	661	341	-20.2	0.37	0.38	0.2	1.8	94	10	303.4	3	0	0	63	1012	0
6	1	15	15	11	128.5	0.287	1.419	0.005	802	354	-16.6	0.37	0.38	0.19	1.8	89	10	304.4	3	0	0	999	1011	0
6	1	15	15	12	131.6	0.299	1.502	0.005	929	377	-18.4	0.37	0.38	0.19	1.9	111	10	304.9	3	0	0	999	1010	0
6	1	15	15	13	117	0.307	1.504	0.005	1048	391	-22.2	0.37	0.38	0.19	2	103	10	304.8	3	0	0	999	1009	6
6	1	15	15	14	72.7	0.315	1.312	0.005	1119	408	-38.8	0.37	0.38	0.19	2.2	103	10	303.9	3	0	0	59	1009	9
6	1	15	15	15	60.9	0.322	1.259	0.005	1179	420	-49.2	0.37	0.38	0.19	2.3	109	10	303.4	3	0	0	67	1009	9
6	1	15	15	16	37.3	0.322	1.079	0.005	1214	420	-80.4	0.37	0.38	0.21	2.4	118	10	302.5	3	0	0	69	1009	9
6	1	15	15	17	0.8	0.208	0.295	0.005	1208	224	-1073.3	0.37	0.38	0.27	1.7	122	10	300.1	3	0	0	72	1010	10
6	1	15	15	18	-1.6	0.061	-9	-9	-999	62	12.5	0.37	0.38	0.49	1	108	10	298.5	3	0	0	77	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	15	15	19	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	107	10	297.9	3	0	0	94	1011	3
6	1	15	15	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	80	10	297.5	3	0	0	94	1011	3
6	1	15	15	21	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	81	10	297.2	3	0	0	94	1012	3
6	1	15	15	22	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	64	10	296.9	3	0	0	88	1012	3
6	1	15	15	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	296.6	3	0	0	94	1011	3
6	1	15	15	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	296.4	3	0	0	94	1011	3
6	1	16	16	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	37	10	296	3	0	0	94	1010	3
6	1	16	16	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	77	10	295.8	3	0	0	97	1010	0
6	1	16	16	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	296.1	3	0	0	100	1010	3
6	1	16	16	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	296.2	3	0	0	97	1010	3
6	1	16	16	5	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	79	10	296.4	3	0	0	93	1010	7
6	1	16	16	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	296.9	3	0	0	90	1011	7
6	1	16	16	7	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	101	10	298.4	3	0	0	94	1012	7
6	1	16	16	8	23.6	0.183	0.432	0.005	123	180	-23.4	0.37	0.38	0.34	1.2	92	10	299.8	3	0	0	82	1013	0
6	1	16	16	9	80.3	0.309	0.856	0.005	282	394	-33.1	0.655	0.64	0.22	1.7	80	10	301.8	3	0	0	72	1013	5
6	1	16	16	10	71.2	0.304	1.05	0.005	587	386	-35.7	0.37	0.38	0.2	2.1	96	10	302.8	3	0	0	70	1013	7
6	1	16	16	11	77.1	0.284	1.214	0.005	839	348	-26.8	0.37	0.38	0.19	1.9	87	10	302.8	3	0	0	70	1012	8
6	1	16	16	12	53.3	0.275	1.11	0.005	928	332	-35.4	0.37	0.38	0.19	1.9	86	10	302	3	0	0	70	1012	9
6	1	16	16	13	56.2	0.286	1.167	0.005	1020	352	-37.5	0.655	0.64	0.18	1.6	82	10	300.9	3	0	0.76	70	1011	10
6	1	16	16	14	48.1	0.284	1.13	0.005	1080	348	-42.8	0.37	0.38	0.19	2	94	10	301.9	3	0	0	999	1010	9
6	1	16	16	15	26.7	0.308	0.933	0.005	1097	393	-98.8	0.655	0.64	0.18	1.9	81	10	300	3	0	0	999	1010	10
6	1	16	16	16	11.4	0.202	0.703	0.005	1103	213	-65.3	0.655	0.64	0.2	1.2	57	10	298.6	3	0	0.25	999	1011	10
6	1	16	16	17	0.5	0.136	0.255	0.005	1104	116	-420.5	0.655	0.64	0.26	0.9	61	10	298.9	3	0	0	999	1011	10
6	1	16	16	18	-2.2	0.066	-9	-9	-999	40	11.9	0.655	0.64	0.48	0.9	83	10	298.6	3	0	0	999	1012	0
6	1	16	16	19	-3.5	0.067	-9	-9	-999	40	7.6	0.37	0.38	1	1.1	128	10	298.2	3	0	0	999	1012	0
6	1	16	16	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	128	10	297.9	3	0	0	88	1013	7
6	1	16	16	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	66	10	297.5	3	0	0	88	1013	7
6	1	16	16	22	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	60	10	296.9	3	0	0	88	1013	7
6	1	16	16	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	297	3	0	0	88	1012	7
6	1	16	16	24	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	74	10	296.8	3	0	0	94	1012	7
6	1	17	17	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.6	3	0	0	94	1012	7
6	1	17	17	2	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	67	10	296.6	3	0	0	94	1012	7
6	1	17	17	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	84	10	296.4	3	0	0	100	1012	3
6	1	17	17	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	87	10	296	3	0	0	100	1012	3
6	1	17	17	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	122	10	296	3	0	0	93	1012	7
6	1	17	17	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	96	10	296.4	3	0	0	97	1013	7
6	1	17	17	7	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	108	10	298.1	3	0	0	90	1014	7
6	1	17	17	8	55.5	0.233	0.885	0.007	451	259	-20.7	0.655	0.64	0.33	1.2	69	10	301.1	3	0	0	85	1014	0
6	1	17	17	9	73.7	0.28	0.999	0.007	490	342	-27.1	0.655	0.64	0.22	1.5	66	10	301.8	3	0	0	78	1015	6
6	1	17	17	10	95.1	0.327	1.123	0.006	539	429	-33.1	0.655	0.64	0.19	1.8	71	10	302	3	0	0	72	1014	8
6	1	17	17	11	130.9	0.351	1.435	0.006	817	477	-29.7	0.655	0.64	0.18	1.9	68	10	303.2	3	0	0	65	1014	7
6	1	17	17	12	80	0.307	1.237	0.005	855	392	-32.6	0.37	0.38	0.19	2.1	95	10	303.2	3	0	0	63	1013	8
6	1	17	17	13	107.9	0.344	1.393	0.005	906	463	-34	0.655	0.64	0.18	1.9	72	10	303	3	0	0	63	1013	9
6	1	17	17	14	80.3	0.335	1.28	0.005	943	446	-42.2	0.655	0.64	0.18	1.9	84	10	302.4	3	0	0	63	1012	9
6	1	17	17	15	63.6	0.289	1.196	0.005	973	358	-34.3	0.655	0.64	0.18	1.6	85	10	302	3	0	0	62	1012	9
6	1	17	17	16	37.5	0.276	1.009	0.005	990	334	-50.8	0.655	0.64	0.2	1.6	75	10	301.5	3	0	0	61	1012	10
6	1	17	17	17	0.7	0.184	0.268	0.005	989	185	-812.2	0.37	0.38	0.26	1.5	101	10	299.9	3	0	0	61	1013	10
6	1	17	17	18	0.1	0.147	0.14	0.005	987	130	-2893.6	0.655	0.64	0.48	1	52	10	298.6	3	0	0	74	1013	7
6	1	17	17	19	-2.4	0.059	-9	-9	-999	37	7.5	0.655	0.64	1	0.8	46	10	297.9	3	0	0	79	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	17	17	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	51	10	297.6	3	0	0	90	1014	7
6	1	17	17	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	297.2	3	0	0	90	1014	3
6	1	17	17	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	123	10	297.2	3	0	0	90	1014	3
6	1	17	17	23	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	109	10	296.9	3	0	0	93	1014	7
6	1	17	17	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	69	10	296.9	3	0	0	97	1013	3
6	1	18	18	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	90	10	296.9	3	0	0	97	1013	3
6	1	18	18	2	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	105	10	296.9	3	0	0	97	1012	7
6	1	18	18	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	105	10	296.9	3	0	0	100	1012	3
6	1	18	18	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	297.1	3	0	0	97	1012	7
6	1	18	18	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	297	3	0	0	97	1013	7
6	1	18	18	6	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	119	10	297	3	0	0	96	1013	0
6	1	18	18	7	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	100	10	297.2	3	0	0	95	1014	0
6	1	18	18	8	45.6	0.255	0.615	0.005	184	295	-32.7	0.655	0.64	0.33	1.4	76	10	299.1	3	0	0	94	1014	0
6	1	18	18	9	76.9	0.268	0.876	0.005	316	319	-22.7	0.655	0.64	0.22	1.4	47	10	301.4	3	0	0	77	1015	6
6	1	18	18	10	115.9	0.333	1.181	0.005	515	443	-28.9	0.655	0.64	0.19	1.8	75	10	301.4	3	0	0	82	1015	6
6	1	18	18	11	167	0.319	1.549	0.005	806	415	-17.6	0.655	0.64	0.18	1.6	57	10	303.8	3	0	0	74	1014	4
6	1	18	18	12	30.6	0.193	0.896	0.005	851	203	-21.4	0.655	0.64	0.18	1	35	10	300.1	3	0	13.72	78	1013	10
6	1	18	18	13	49.5	0.257	1.084	0.005	930	299	-30.9	0.655	0.64	0.18	1.4	70	10	298.1	3	0	0.76	82	1013	10
6	1	18	18	14	58.6	0.3	1.178	0.005	1008	378	-41.6	0.655	0.64	0.18	1.7	67	10	298.5	3	0	0.51	88	1012	10
6	1	18	18	15	43.8	0.214	1.083	0.005	1046	231	-20.3	0.655	0.64	0.18	1.1	74	10	298.4	3	0	0	94	1011	10
6	1	18	18	16	11.4	0.161	0.693	0.005	1056	149	-32.8	0.37	0.38	0.21	1.1	104	10	298.1	3	0	0	88	1011	10
6	1	18	18	17	1.1	0.128	0.318	0.005	1056	106	-173.3	0.37	0.38	0.26	1	113	10	297.8	3	0	0	88	1011	10
6	1	18	18	18	0.1	0.098	0.143	0.005	1055	71	-857.4	0.37	0.38	0.48	0.8	104	10	297.4	3	0	0	94	1012	7
6	1	18	18	19	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	99	10	297.2	3	0	0	94	1012	0
6	1	18	18	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	65	10	296.9	3	0	0	94	1013	7
6	1	18	18	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	296.2	3	0	0	100	1013	3
6	1	18	18	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	99	10	296	3	0	0	97	1013	3
6	1	18	18	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	295.9	3	0	0	87	1012	7
6	1	18	18	24	-5.8	0.095	-9	-9	-999	68	13.6	0.655	0.64	1	1.3	33	10	295.9	3	0	0	90	1012	7
6	1	19	19	1	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	52	10	295.9	3	0	0	87	1012	0
6	1	19	19	2	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	104	10	295.5	3	0	0	84	1011	7
6	1	19	19	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	108	10	295.2	3	0	0	97	1010	3
6	1	19	19	4	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	79	10	294.9	3	0	0	90	1010	7
6	1	19	19	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	114	10	294.9	3	0	0	97	1010	7
6	1	19	19	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	91	10	295	3	0	0	100	1011	7
6	1	19	19	7	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	82	10	297.2	3	0	0	93	1012	7
6	1	19	19	8	55.2	0.193	0.781	0.005	311	194	-11.7	0.655	0.64	0.33	0.9	52	10	300.6	3	0	0	90	1012	0
6	1	19	19	9	106.9	0.331	1.366	0.005	861	438	-30.6	0.655	0.64	0.22	1.8	39	10	301.6	3	0	0	74	1012	0
6	1	19	19	10	146.4	0.355	1.612	0.005	1034	485	-27.5	0.655	0.64	0.19	1.9	39	10	302.8	3	0	0	59	1012	0
6	1	19	19	11	156	0.344	1.736	0.006	1212	464	-23.5	0.655	0.64	0.18	1.8	42	10	303.2	3	0	0	55	1012	5
6	1	19	19	12	169.4	0.32	1.875	0.008	1404	417	-17.4	0.655	0.64	0.18	1.6	33	10	303.8	3	0	0	48	1010	6
6	1	19	19	13	109.2	0.383	1.633	0.007	1437	546	-46.4	0.655	0.64	0.18	2.2	348	10	302.1	3	0	0	52	1009	9
6	1	19	19	14	156.1	0.409	1.86	0.007	1487	601	-39.3	0.655	0.64	0.18	2.3	344	10	302.8	3	0	0	48	1008	6
6	1	19	19	15	117.7	0.425	1.708	0.007	1525	637	-58.7	0.655	0.64	0.18	2.5	357	10	302.9	3	0	0	51	1008	7
6	1	19	19	16	53.4	0.376	1.318	0.006	1542	532	-89.5	0.655	0.64	0.2	2.3	0	10	301.8	3	0	0	55	1008	9
6	1	19	19	17	4.3	0.231	0.569	0.006	1541	267	-255.9	0.655	0.64	0.25	1.5	26	10	299.9	3	0	0	61	1008	10
6	1	19	19	18	-2.7	0.128	-9	-9	-999	110	69.9	0.655	0.64	0.47	1.1	35	10	298.2	3	0	0	65	1009	3
6	1	19	19	19	-2.2	0.059	-9	-9	-999	34	8.4	0.655	0.64	1	0.8	45	10	297.4	3	0	0	74	1009	7
6	1	19	19	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	296.5	3	0	0	79	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	19	19	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	100	10	296.1	3	0	0	90	1010	3
6	1	19	19	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	295.9	3	0	0	90	1010	3
6	1	19	19	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	295.4	3	0	0	93	1010	3
6	1	19	19	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	295.4	3	0	0	93	1010	3
6	1	20	20	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	295	3	0	0	100	1009	3
6	1	20	20	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	96	10	294.9	3	0	0	96	1008	3
6	1	20	20	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	96	10	294.6	3	0	0	93	1008	3
6	1	20	20	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	294.6	3	0	0	93	1008	3
6	1	20	20	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	294.8	3	0	0	96	1008	3
6	1	20	20	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	115	10	294.9	3	0	0	100	1009	3
6	1	20	20	7	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	83	10	298.2	3	0	0	93	1010	3
6	1	20	20	8	55.1	0.207	0.708	0.005	232	216	-14.4	0.655	0.64	0.33	1	75	10	300.6	3	0	0	87	1011	0
6	1	20	20	9	67.1	0.226	0.86	0.005	343	247	-15.5	0.37	0.38	0.23	1.4	107	10	301.8	3	0	0	74	1012	0
6	1	20	20	10	104.2	0.259	1.143	0.005	516	304	-15.1	0.37	0.38	0.2	1.6	99	10	303	3	0	0	66	1011	0
6	1	20	20	11	123.4	0.264	1.413	0.005	825	312	-13.4	0.37	0.38	0.19	1.6	112	10	304	3	0	0	59	1010	0
6	1	20	20	12	110.7	0.215	1.429	0.005	951	231	-8.1	0.37	0.38	0.19	1.2	104	10	304.6	3	0	0	55	1009	7
6	1	20	20	13	113.6	0.164	1.504	0.005	1078	154	-3.5	0.655	0.64	0.18	0.6	4	10	303.5	3	0	0	53	1008	9
6	1	20	20	14	47.8	0.189	1.145	0.005	1129	190	-12.8	0.655	0.64	0.18	0.9	351	10	302.1	3	0	0	52	1008	10
6	1	20	20	15	29.2	0.138	0.981	0.005	1160	118	-8	0.655	0.64	0.18	0.6	6	10	301.4	3	0	0	52	1008	10
6	1	20	20	16	13.9	0.218	0.769	0.005	1176	234	-66.7	0.37	0.38	0.21	1.6	125	10	301.8	3	0	0	59	1008	10
6	1	20	20	17	2	0.188	0.403	0.005	1175	188	-299.7	0.37	0.38	0.26	1.5	114	10	300.4	3	0	0	65	1008	10
6	1	20	20	18	0.1	0.17	0.148	0.005	1171	162	-4443.3	0.37	0.38	0.47	1.4	110	10	299.1	3	0	0	79	1009	7
6	1	20	20	19	-3.1	0.067	-9	-9	-999	46	8.7	0.37	0.38	1	1.1	101	10	298.4	3	0	0	79	1009	7
6	1	20	20	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	83	10	298	3	0	0	82	1010	7
6	1	20	20	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	297.8	3	0	0	79	1010	7
6	1	20	20	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	91	10	297.9	3	0	0	85	1011	7
6	1	20	20	23	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	93	10	297.5	3	0	0	90	1010	7
6	1	20	20	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	107	10	296.9	3	0	0	94	1010	7
6	1	21	21	1	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	84	10	296.9	3	0	0	94	1009	3
6	1	21	21	2	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	92	10	297	3	0	0	94	1009	7
6	1	21	21	3	-3.5	0.067	-9	-9	-999	40	7.5	0.37	0.38	1	1.1	90	10	296.9	3	0	0	94	1009	0
6	1	21	21	4	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	103	10	296.4	3	0	0	94	1009	3
6	1	21	21	5	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	88	10	296.4	3	0	0	94	1010	7
6	1	21	21	6	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	62	10	296.2	3	0	0	97	1010	3
6	1	21	21	7	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	85	10	296.5	3	0	0	97	1011	3
6	1	21	21	8	28.6	0.208	0.329	0.007	45	218	-28.4	0.37	0.38	0.34	1.4	86	10	299.5	3	0	0	85	1012	0
6	1	21	21	9	84.1	0.308	0.746	0.007	178	393	-31.4	0.37	0.38	0.23	2.1	92	10	302.4	3	0	0	74	1013	0
6	1	21	21	10	87.4	0.287	0.916	0.007	317	354	-24.5	0.37	0.38	0.2	1.9	86	10	303.4	3	0	0	78	1013	5
6	1	21	21	11	68.7	0.292	0.929	0.007	422	363	-32.7	0.37	0.38	0.19	2	106	10	300.4	3	0	0.25	83	1012	8
6	1	21	21	12	82	0.297	1.08	0.006	554	371	-28.7	0.37	0.38	0.19	2	100	10	301.9	3	0	0	88	1011	8
6	1	21	21	13	59.7	0.235	1.023	0.005	646	263	-19.6	0.655	0.64	0.18	1.2	84	10	300.5	3	0	0.25	75	1010	10
6	1	21	21	14	39.3	0.258	0.919	0.005	711	301	-39.3	0.37	0.38	0.19	1.8	91	10	301.5	3	0	0	63	1009	10
6	1	21	21	15	39.1	0.29	0.943	0.005	773	359	-56.2	0.37	0.38	0.19	2.1	97	10	301.5	3	0	0	67	1009	10
6	1	21	21	16	39.6	0.28	0.964	0.005	816	340	-49.7	0.37	0.38	0.2	2	89	10	301.8	3	0	0	74	1009	9
6	1	21	21	17	6.7	0.209	0.534	0.005	819	221	-122.5	0.37	0.38	0.26	1.6	92	10	300.6	3	0	0	67	1010	10
6	1	21	21	18	-2.4	0.192	-9	-9	-999	194	270.4	0.655	0.64	0.46	1.4	76	10	299.4	3	0	0	74	1010	3
6	1	21	21	19	-6.4	0.095	-9	-9	-999	71	12.2	0.655	0.64	1	1.3	78	10	298.6	3	0	0	79	1011	3
6	1	21	21	20	-6.6	0.095	-9	-9	-999	68	11.9	0.655	0.64	1	1.3	82	10	297.9	3	0	0	82	1012	0
6	1	21	21	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	62	10	297.8	3	0	0	94	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	21	21	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	84	10	297.5	3	0	0	88	1012	3
6	1	21	21	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	66	10	297.4	3	0	0	88	1012	7
6	1	21	21	24	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	69	10	297.2	3	0	0	88	1012	3
6	1	22	22	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	64	10	297.1	3	0	0	88	1010	3
6	1	22	22	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	64	10	297.1	3	0	0	91	1010	7
6	1	22	22	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	83	10	297.1	3	0	0	88	1010	7
6	1	22	22	4	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	78	10	297	3	0	0	88	1010	7
6	1	22	22	5	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	90	10	297.1	3	0	0	97	1010	7
6	1	22	22	6	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	86	10	297.1	3	0	0	95	1011	0
6	1	22	22	7	-5.6	0.088	-9	-9	-999	60	11	0.655	0.64	1	1.2	81	10	298.9	3	0	0	93	1012	0
6	1	22	22	8	47.6	0.308	0.678	0.005	236	393	-55.4	0.655	0.64	0.33	1.8	76	10	300.2	3	0	0	91	1013	0
6	1	22	22	9	74.6	0.372	0.93	0.005	389	521	-62.3	0.655	0.64	0.22	2.2	77	10	300.2	3	0	0.25	84	1013	6
6	1	22	22	10	126.7	0.467	1.403	0.005	788	733	-72.3	0.655	0.64	0.19	2.8	84	10	301.6	3	0	0	77	1013	5
6	1	22	22	11	75.6	0.403	1.22	0.005	868	591	-78.2	0.37	0.38	0.19	3	90	10	302	3	0	0	65	1012	8
6	1	22	22	12	151	0.499	1.626	0.006	1028	810	-74.1	0.655	0.64	0.18	3	85	10	302.9	3	0	0	64	1011	7
6	1	22	22	13	66.9	0.335	1.267	0.006	1096	464	-50.6	0.37	0.38	0.19	2.4	96	10	301.5	3	0	0	63	1010	9
6	1	22	22	14	93.5	0.457	1.456	0.006	1191	710	-91.9	0.655	0.64	0.18	2.8	81	10	299.9	3	0	0	63	1010	9
6	1	22	22	15	84.9	0.414	1.441	0.006	1272	615	-75.5	0.655	0.64	0.18	2.5	81	10	301.5	3	0	0	82	1010	9
6	1	22	22	16	43.9	0.385	1.163	0.006	1289	549	-116.7	0.655	0.64	0.2	2.4	82	10	300.4	3	0	0	77	1010	9
6	1	22	22	17	6	0.289	0.6	0.006	1291	361	-359.3	0.655	0.64	0.25	1.9	77	10	299.9	3	0	0	72	1010	10
6	1	22	22	18	-2.2	0.193	-9	-9	-999	199	291.8	0.655	0.64	0.46	1.4	82	10	298.8	3	0	0	69	1010	3
6	1	22	22	19	-3.8	0.073	-9	-9	-999	56	9.3	0.655	0.64	1	1	72	10	297.9	3	0	0	74	1011	3
6	1	22	22	20	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	85	10	297.5	3	0	0	79	1012	3
6	1	22	22	21	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	81	10	297.8	3	0	0	74	1012	3
6	1	22	22	22	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	78	10	297.9	3	0	0	74	1012	3
6	1	22	22	23	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	69	10	297.9	3	0	0	79	1012	3
6	1	22	22	24	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	73	10	297.4	3	0	0	79	1011	0
6	1	23	23	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	48	10	296.5	3	0	0	79	1011	3
6	1	23	23	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	61	10	296.1	3	0	0	82	1010	3
6	1	23	23	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	53	10	296.4	3	0	0	84	1010	3
6	1	23	23	4	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	88	10	296.4	3	0	0.51	84	1010	3
6	1	23	23	5	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	76	10	296	3	0	0.25	88	1010	3
6	1	23	23	6	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	83	10	295.9	3	0	0	92	1011	0
6	1	23	23	7	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	78	10	297.6	3	0	0	97	1012	3
6	1	23	23	8	37.2	0.289	0.578	0.005	187	358	-58.6	0.655	0.64	0.33	1.7	76	10	299.9	3	0	0	79	1013	0
6	1	23	23	9	91.4	0.339	1.047	0.005	453	453	-38.4	0.655	0.64	0.22	1.9	76	10	301.4	3	0	0	72	1013	0
6	1	23	23	10	77.2	0.339	1.133	0.005	680	453	-45.4	0.37	0.38	0.2	2.4	90	10	301.9	3	0	1.02	72	1013	7
6	1	23	23	11	82.7	0.286	1.24	0.005	833	353	-25.5	0.37	0.38	0.19	1.9	87	10	301	3	0	0	72	1012	8
6	1	23	23	12	83.5	0.308	1.278	0.005	901	393	-31.5	0.37	0.38	0.19	2.1	96	10	302.5	3	0	0	67	1011	8
6	1	23	23	13	100.1	0.324	1.397	0.005	983	424	-30.5	0.37	0.38	0.19	2.2	94	10	303	3	0	0	65	1010	8
6	1	23	23	14	76	0.317	1.301	0.005	1044	410	-37.6	0.37	0.38	0.19	2.2	89	10	302.8	3	0	0	63	1010	8
6	1	23	23	15	51.6	0.264	1.158	0.005	1084	312	-31.9	0.37	0.38	0.19	1.8	86	10	301.8	3	0	0	64	1010	9
6	1	23	23	16	42.3	0.292	1.094	0.005	1116	363	-53.2	0.655	0.64	0.2	1.7	85	10	300.4	3	0	1.02	65	1010	10
6	1	23	23	17	4.1	0.182	0.505	0.005	1118	184	-131.5	0.37	0.38	0.26	1.4	86	10	299.9	3	0	0	67	1010	10
6	1	23	23	18	0.1	0.194	0.146	0.005	1115	197	-6626.6	0.37	0.38	0.46	1.6	89	10	298.2	3	0	0.25	72	1010	7
6	1	23	23	19	-4.1	0.073	-9	-9	-999	56	8.4	0.37	0.38	1	1.2	86	10	297.6	3	0	0	88	1011	3
6	1	23	23	20	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	94	10	297.4	3	0	0.25	85	1012	7
6	1	23	23	21	-10	0.117	-9	-9	-999	93	14.6	0.655	0.64	1	1.6	82	10	297.1	3	0	0	86	1011	0
6	1	23	23	22	-6.5	0.095	-9	-9	-999	68	12.1	0.655	0.64	1	1.3	84	10	297.2	3	0	0.25	88	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	23	23	23	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	97	10	296.9	3	0	1.02	88	1011	7
6	1	23	23	24	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	83	10	296.9	3	0	1.02	88	1011	7
6	1	24	24	1	-6.7	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	78	10	296.9	3	0	1.27	94	1010	7
6	1	24	24	2	-4	0.088	-9	-9	-999	60	15.5	0.655	0.64	1	1.2	69	10	296.9	3	0	0	94	1010	10
6	1	24	24	3	-5.5	0.088	-9	-9	-999	60	11.2	0.655	0.64	1	1.2	69	10	296.9	3	0	0	94	1009	3
6	1	24	24	4	-5.7	0.085	-9	-9	-999	57	9.6	0.37	0.38	1	1.4	86	10	296.9	3	0	0	94	1009	0
6	1	24	24	5	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	83	10	297	3	0	0.25	94	1010	7
6	1	24	24	6	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	98	10	296.9	3	0	5.33	90	1011	3
6	1	24	24	7	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	78	10	296.8	3	0	6.35	94	1012	7
6	1	24	24	8	6.5	0.175	0.262	0.005	99	169	-74.7	0.37	0.38	0.34	1.3	86	10	297.1	3	0	2.03	94	1012	10
6	1	24	24	9	18	0.211	0.417	0.005	145	223	-47	0.37	0.38	0.23	1.5	86	10	297.6	3	0	3.05	100	1012	10
6	1	24	24	10	27.7	0.218	0.551	0.005	217	234	-33.8	0.37	0.38	0.2	1.5	105	10	298.2	3	0	0.51	94	1012	10
6	1	24	24	11	33.1	0.243	0.653	0.005	303	276	-39.3	0.37	0.38	0.19	1.7	108	10	298.5	3	0	5.59	97	1012	10
6	1	24	24	12	24.1	0.237	0.625	0.005	365	266	-50.1	0.37	0.38	0.19	1.7	102	10	297.5	3	0	4.57	94	1011	10
6	1	24	24	13	25.2	0.238	0.67	0.005	429	268	-48.3	0.37	0.38	0.19	1.7	117	10	297	3	0	1.27	94	1010	10
6	1	24	24	14	21.6	0.225	0.663	0.005	486	245	-47.3	0.37	0.38	0.19	1.6	107	10	297.6	3	0	3.05	97	1010	10
6	1	24	24	15	10.1	0.224	0.524	0.005	511	245	-100.9	0.37	0.38	0.19	1.7	112	10	297.1	3	0	8.64	95	1010	10
6	1	24	24	16	9.9	0.213	0.529	0.005	537	226	-87.9	0.37	0.38	0.2	1.6	98	10	297.4	3	0	0.51	94	1009	10
6	1	24	24	17	1.6	0.169	0.291	0.005	542	160	-264.6	0.655	0.64	0.25	1.1	75	10	297.6	3	0	0	97	1010	10
6	1	24	24	18	0.1	0.162	0.115	0.005	542	150	-3828.2	0.655	0.64	0.45	1.1	72	10	297.5	3	0	0	100	1010	7
6	1	24	24	19	-4.7	0.081	-9	-9	-999	55	10	0.655	0.64	1	1.1	85	10	297.5	3	0	0	97	1010	0
6	1	24	24	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	69	10	297.6	3	0	0	94	1011	7
6	1	24	24	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	297.6	3	0	0.25	88	1012	3
6	1	24	24	22	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	94	10	297.4	3	0	2.03	88	1012	7
6	1	24	24	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	296.9	3	0	1.78	94	1012	7
6	1	24	24	24	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	97	10	296.9	3	0	2.79	100	1012	7
6	1	25	25	1	-2.9	0.061	-9	-9	-999	34	6.8	0.37	0.38	1	1	87	10	296.6	3	0	1.02	97	1011	0
6	1	25	25	2	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	82	10	296.9	3	0	0.51	94	1010	7
6	1	25	25	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	297.1	3	0	0.25	100	1010	7
6	1	25	25	4	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	95	10	297.2	3	0	0.51	94	1010	7
6	1	25	25	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297.2	3	0	0.25	94	1011	7
6	1	25	25	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	297.4	3	0	0	94	1011	7
6	1	25	25	7	-0.5	0.03	-9	-9	-999	12	4.8	0.37	0.38	1	0.5	96	10	297.5	3	0	0	100	1013	10
6	1	25	25	8	1.7	0.098	0.1	0.005	21	70	-49.3	0.37	0.38	0.34	0.7	102	10	298	3	0	0	88	1014	10
6	1	25	25	9	43.6	0.206	0.66	0.005	238	214	-18	0.37	0.38	0.23	1.3	90	10	299.8	3	0	0	88	1014	8
6	1	25	25	10	49.8	0.285	0.783	0.005	349	349	-41.8	0.37	0.38	0.2	2	110	10	301.4	3	0	0	88	1014	9
6	1	25	25	11	49.1	0.273	0.853	0.005	457	329	-37.7	0.37	0.38	0.19	1.9	112	10	301.2	3	0	0	79	1014	9
6	1	25	25	12	48	0.262	1.025	0.005	812	308	-33.8	0.37	0.38	0.19	1.8	98	10	301.1	3	0	0	88	1013	10
6	1	25	25	13	46.7	0.239	1.027	0.005	837	270	-26.5	0.37	0.38	0.19	1.6	123	10	301.1	3	0	0	88	1013	10
6	1	25	25	14	8.2	0.189	0.576	0.005	840	189	-74.1	0.37	0.38	0.19	1.4	91	10	298.9	3	0	7.37	85	1012	10
6	1	25	25	15	15.4	0.165	0.713	0.005	848	154	-26.2	0.37	0.38	0.19	1.1	108	10	298.2	3	0	2.54	88	1012	10
6	1	25	25	16	10.5	0.17	0.628	0.005	854	162	-42.7	0.37	0.38	0.2	1.2	119	10	298.9	3	0	0.25	88	1012	10
6	1	25	25	17	0.3	0.1	0.189	0.005	854	74	-319.7	0.37	0.38	0.25	0.8	111	10	298.6	3	0	0	90	1012	10
6	1	25	25	18	0.1	0.09	0.133	0.005	853	62	-653.4	0.655	0.64	0.45	0.6	71	10	298	3	0	0	94	1012	7
6	1	25	25	19	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	297.8	3	0	0	94	1013	7
6	1	25	25	20	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	68	10	297.5	3	0	0	97	1013	7
6	1	25	25	21	-0.7	0.037	-9	-9	-999	16	6.4	0.655	0.64	1	0.5	60	10	297.4	3	0	0	94	1013	10
6	1	25	25	22	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	31	10	297	3	0	0	100	1013	7
6	1	25	25	23	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	35	10	296.8	3	0	0	88	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	25	25	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	59	10	296.9	3	0	0	100	1013	7
6	1	26	26	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	80	10	296.6	3	0	0	94	1012	7
6	1	26	26	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	296.5	3	0	0	97	1012	7
6	1	26	26	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	62	10	296.4	3	0	0	94	1012	7
6	1	26	26	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	67	10	296.5	3	0	0	94	1012	3
6	1	26	26	5	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	70	10	296.8	3	0	0	94	1012	7
6	1	26	26	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	100	10	296.9	3	0	0	88	1013	7
6	1	26	26	7	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	94	10	298.8	3	0	0	88	1013	3
6	1	26	26	8	36.1	0.245	0.597	0.005	212	279	-36.9	0.37	0.38	0.34	1.7	104	10	300.8	3	0	0	82	1014	0
6	1	26	26	9	66	0.324	0.881	0.005	374	423	-46.5	0.37	0.38	0.23	2.3	109	10	301.9	3	0	0	77	1014	0
6	1	26	26	10	86.1	0.32	1.118	0.005	587	415	-34.3	0.37	0.38	0.2	2.2	108	10	302.8	3	0	0	72	1015	6
6	1	26	26	11	96.1	0.345	1.289	0.006	808	465	-38.5	0.37	0.38	0.19	2.4	117	10	303.2	3	0	0	68	1014	7
6	1	26	26	12	98.9	0.378	1.35	0.007	901	534	-49.3	0.37	0.38	0.19	2.7	122	10	303.4	3	0	0	66	1014	7
6	1	26	26	13	102.9	0.347	1.416	0.008	998	470	-36.5	0.37	0.38	0.19	2.4	122	10	303.9	3	0	0	65	1013	7
6	1	26	26	14	102.9	0.314	1.461	0.008	1095	404	-27	0.37	0.38	0.19	2.1	107	10	304	3	0	0	63	1012	7
6	1	26	26	15	69.8	0.304	1.305	0.008	1149	385	-36.2	0.37	0.38	0.19	2.1	112	10	303.6	3	0	0	65	1012	8
6	1	26	26	16	31.4	0.264	1.002	0.007	1159	313	-52.9	0.37	0.38	0.2	1.9	109	10	302.2	3	0	0	70	1012	10
6	1	26	26	17	10.4	0.203	0.695	0.007	1162	211	-72.1	0.37	0.38	0.25	1.5	95	10	301.2	3	0	0	74	1012	10
6	1	26	26	18	0.1	0.147	0.148	0.007	1161	131	-2892.7	0.655	0.64	0.45	1	79	10	299.8	3	0	0	77	1012	3
6	1	26	26	19	-2.4	0.059	-9	-9	-999	37	7.5	0.655	0.64	1	0.8	74	10	299	3	0	0	88	1013	3
6	1	26	26	20	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	85	10	298.6	3	0	0	88	1013	3
6	1	26	26	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	80	10	298.1	3	0	0	94	1014	3
6	1	26	26	22	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	61	10	297.9	3	0	0	91	1014	0
6	1	26	26	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	88	1014	7
6	1	26	26	24	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	66	10	297.8	3	0	0	91	1014	0
6	1	27	27	1	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	52	10	297.5	3	0	0	94	1013	0
6	1	27	27	2	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	61	10	297.5	3	0	0	97	1013	3
6	1	27	27	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	38	10	297.4	3	0	0	94	1013	7
6	1	27	27	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	297.2	3	0	0	94	1013	7
6	1	27	27	5	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	69	10	297.4	3	0	0	94	1013	7
6	1	27	27	6	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	75	10	297.4	3	0	0.25	88	1013	7
6	1	27	27	7	-6.5	0.091	-9	-9	-999	63	10.5	0.37	0.38	1	1.5	88	10	298.2	3	0	0	88	1014	3
6	1	27	27	8	43.5	0.293	0.61	0.005	189	364	-52.2	0.655	0.64	0.33	1.7	84	10	300.5	3	0	0	85	1015	0
6	1	27	27	9	74	0.294	0.882	0.005	335	366	-31	0.655	0.64	0.22	1.6	82	10	301.9	3	0	0	67	1016	7
6	1	27	27	10	80.9	0.285	1.034	0.005	495	350	-25.9	0.37	0.38	0.2	1.9	92	10	302.1	3	0	0	80	1015	6
6	1	27	27	11	96	0.322	1.221	0.005	686	421	-31.6	0.37	0.38	0.19	2.2	95	10	303.1	3	0	0	94	1015	7
6	1	27	27	12	70.7	0.304	1.166	0.005	810	385	-35.9	0.37	0.38	0.19	2.1	101	10	301.8	3	0	0	79	1014	9
6	1	27	27	13	77.3	0.349	1.228	0.005	866	475	-49.8	0.37	0.38	0.19	2.5	102	10	302.4	3	0	0	77	1013	9
6	1	27	27	14	51.6	0.339	1.088	0.005	901	455	-68.4	0.37	0.38	0.19	2.5	98	10	300.9	3	0	0	75	1012	9
6	1	27	27	15	54.1	0.33	1.121	0.005	941	435	-59.7	0.37	0.38	0.19	2.4	99	10	301.6	3	0	0	79	1012	9
6	1	27	27	16	33.5	0.309	0.964	0.005	965	395	-79.3	0.37	0.38	0.2	2.3	99	10	301.6	3	0	0	82	1012	9
6	1	27	27	17	5.6	0.23	0.531	0.005	967	255	-195.5	0.37	0.38	0.25	1.8	88	10	300.5	3	0	0	85	1012	10
6	1	27	27	18	-4.7	0.174	-9	-9	-999	168	101.8	0.655	0.64	0.44	1.4	69	10	298.8	3	0	0	86	1012	0
6	1	27	27	19	-5.7	0.095	-9	-9	-999	69	13.7	0.655	0.64	1	1.3	67	10	298.2	3	0	0	88	1013	7
6	1	27	27	20	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	75	10	298	3	0	0	91	1013	7
6	1	27	27	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	79	10	297.9	3	0	0	94	1014	7
6	1	27	27	22	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	77	10	297.8	3	0	0.25	92	1014	0
6	1	27	27	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	297.5	3	0	0	91	1014	7
6	1	27	27	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	297.4	3	0	0	94	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	28	28	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	82	10	297.2	3	0	0	100	1013	3
6	1	28	28	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	65	10	297.1	3	0	0	88	1013	7
6	1	28	28	3	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	72	10	297.1	3	0	0	94	1012	3
6	1	28	28	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	63	10	296.9	3	0	0	94	1013	3
6	1	28	28	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	70	10	296.8	3	0	0	97	1013	7
6	1	28	28	6	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	82	10	296.9	3	0	0	100	1013	7
6	1	28	28	7	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	58	10	299.1	3	0	0	92	1014	0
6	1	28	28	8	51.1	0.245	-9	-9	-999	278	-25.9	0.655	0.64	0.33	1.3	79	10	301.1	3	0	0	85	1015	0
6	1	28	28	9	83.3	0.336	-9	-9	-999	447	-41.1	0.655	0.64	0.22	1.9	70	10	302.1	3	0	0	70	1016	0
6	1	28	28	10	88.7	0.309	-9	-9	-999	396	-30.2	0.37	0.38	0.2	2.1	87	10	303	3	0	0	65	1015	6
6	1	28	28	11	78.7	0.321	-9	-9	-999	418	-38.1	0.655	0.64	0.18	1.8	79	10	302.9	3	0	0	61	1015	9
6	1	28	28	12	65.9	0.269	-9	-9	-999	322	-26.7	0.37	0.38	0.19	1.8	100	10	302.2	3	0	0	65	1014	9
6	1	28	28	13	96.2	0.314	-9	-9	-999	405	-29.2	0.655	0.64	0.18	1.7	79	10	301.4	3	0	0	70	1013	9
6	1	28	28	14	76.9	0.307	-9	-9	-999	392	-34.1	0.655	0.64	0.18	1.7	61	10	302.6	3	0	0	68	1012	9
6	1	28	28	15	40.1	0.226	-9	-9	-999	249	-25.9	0.655	0.64	0.18	1.2	36	10	301.4	3	0	0	68	1012	10
6	1	28	28	16	17.8	0.235	-9	-9	-999	262	-66	0.655	0.64	0.19	1.4	44	10	300.8	3	0	0	69	1012	10
6	1	28	28	17	0.1	0.162	-9	-9	-999	151	-3837.1	0.655	0.64	0.24	1.1	56	10	300	3	0	0	70	1012	10
6	1	28	28	18	0.1	0.133	-9	-9	-999	112	-2120	0.655	0.64	0.44	0.9	57	10	298.8	3	0	0	74	1013	7
6	1	28	28	19	-3.2	0.066	-9	-9	-999	40	8.2	0.655	0.64	1	0.9	44	10	297.9	3	0	0	75	1013	0
6	1	28	28	20	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	42	10	297.2	3	0	0	77	1014	7
6	1	28	28	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	297	3	0	0	79	1014	3
6	1	28	28	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	297.2	3	0	0	85	1014	3
6	1	28	28	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	34	10	297.2	3	0	0	87	1014	3
6	1	28	28	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	69	10	297	3	0	0	90	1014	3
6	1	29	29	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	71	10	296.2	3	0	0	90	1013	3
6	1	29	29	2	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	79	10	295.9	3	0	0	90	1013	3
6	1	29	29	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	295.6	3	0	0	90	1012	3
6	1	29	29	4	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	295.9	3	0	0	90	1012	7
6	1	29	29	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	296.2	3	0	0	87	1013	7
6	1	29	29	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	296.4	3	0	0	90	1013	3
6	1	29	29	7	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	69	10	297.9	3	0	0	90	1013	7
6	1	29	29	8	49.5	0.23	0.762	0.005	323	254	-22.4	0.655	0.64	0.33	1.2	55	10	300.6	3	0	0	76	1014	0
6	1	29	29	9	70.3	0.239	1.078	0.005	644	270	-17.7	0.655	0.64	0.22	1.2	74	10	301.2	3	0	0	63	1014	7
6	1	29	29	10	80.4	0.269	1.231	0.005	841	322	-22	0.655	0.64	0.19	1.4	77	10	300.9	3	0	0	67	1014	8
6	1	29	29	11	92	0.273	1.329	0.005	924	329	-20.1	0.655	0.64	0.18	1.4	81	10	300.8	3	0	0	72	1014	9
6	1	29	29	12	104.7	0.277	1.434	0.005	1020	335	-18.4	0.655	0.64	0.18	1.4	31	10	300.4	3	0	3.05	94	1013	9
6	1	29	29	13	85	0.311	1.372	0.005	1098	398	-31.9	0.655	0.64	0.18	1.7	66	10	300.6	3	0	0	79	1012	9
6	1	29	29	14	70.9	0.305	1.318	0.005	1165	388	-36.1	0.655	0.64	0.18	1.7	69	10	301.4	3	0	0	79	1011	9
6	1	29	29	15	49.2	0.283	1.182	0.005	1211	346	-41.3	0.655	0.64	0.18	1.6	74	10	301.8	3	0	0	76	1011	10
6	1	29	29	16	25.2	0.242	0.952	0.005	1233	274	-50.6	0.655	0.64	0.19	1.4	71	10	301.4	3	0	0	73	1011	10
6	1	29	29	17	6.3	0.221	0.601	0.005	1237	239	-153.4	0.655	0.64	0.24	1.4	82	10	300.4	3	0	0	70	1011	10
6	1	29	29	18	0.1	0.191	0.151	0.005	1234	192	-6301.6	0.655	0.64	0.44	1.3	83	10	298.9	3	0	0	79	1011	7
6	1	29	29	19	-3.4	0.073	-9	-9	-999	55	10.5	0.655	0.64	1	1	72	10	298	3	0	0	79	1012	7
6	1	29	29	20	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	75	10	297.8	3	0	0	85	1012	3
6	1	29	29	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	297.4	3	0	0	90	1013	3
6	1	29	29	22	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	105	10	296.9	3	0	0	90	1013	7
6	1	29	29	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	86	10	296.4	3	0	0	93	1013	0
6	1	29	29	24	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	76	10	296.9	3	0	0	93	1013	0
6	1	30	30	1	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	71	10	296.6	3	0	0	94	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	1	30	30	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	88	10	296.2	3	0	0	93	1012	0
6	1	30	30	3	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	77	10	296.1	3	0	0	97	1011	3
6	1	30	30	4	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	69	10	295.8	3	0	0	97	1011	3
6	1	30	30	5	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	72	10	295.6	3	0	0	93	1012	3
6	1	30	30	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	295.6	3	0	0	93	1012	7
6	1	30	30	7	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	71	10	298.1	3	0	0	93	1013	7
6	1	30	30	8	55.4	0.26	0.672	0.005	198	305	-28.6	0.655	0.64	0.33	1.4	71	10	300.8	3	0	0	87	1013	0
6	1	30	30	9	96.9	0.353	1.001	0.005	374	483	-41.1	0.655	0.64	0.22	2	83	10	301.8	3	0	0	67	1014	0
6	1	30	30	10	104.5	0.282	1.177	0.005	565	346	-19.3	0.37	0.38	0.2	1.8	92	10	303.2	3	0	0	68	1014	0
6	1	30	30	11	99.8	0.291	1.273	0.005	747	361	-22.4	0.37	0.38	0.19	1.9	98	10	303.2	3	0	0	70	1013	7
6	1	30	30	12	111.8	0.284	1.386	0.006	861	347	-18.4	0.37	0.38	0.19	1.8	100	10	304.1	3	0	0	63	1012	7
6	1	30	30	13	85.3	0.265	1.301	0.007	932	314	-19.7	0.37	0.38	0.19	1.7	95	10	303.6	3	0	0	56	1011	8
6	1	30	30	14	95.5	0.268	1.389	0.006	1012	320	-18.2	0.37	0.38	0.19	1.7	98	10	304.2	3	0	0	50	1011	8
6	1	30	30	15	77.5	0.273	1.322	0.006	1076	328	-23.7	0.37	0.38	0.19	1.8	108	10	303.9	3	0	0	55	1010	8
6	1	30	30	16	27.8	0.251	0.945	0.006	1096	289	-51.2	0.37	0.38	0.2	1.8	99	10	302.4	3	0	0	60	1011	10
6	1	30	30	17	4.9	0.232	0.53	0.006	1096	256	-229.1	0.655	0.64	0.24	1.5	81	10	300.8	3	0	0	65	1011	10
6	1	30	30	18	0.1	0.177	0.145	0.006	1093	171	-4965.1	0.655	0.64	0.44	1.2	83	10	299	3	0	0	79	1011	3
6	1	30	30	19	-4.7	0.081	-9	-9	-999	57	10	0.655	0.64	1	1.1	74	10	298.2	3	0	0	80	1012	0
6	1	30	30	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	84	10	297.5	3	0	0	82	1012	7
6	1	30	30	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	88	10	296.9	3	0	0	79	1013	3
6	1	30	30	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	296.4	3	0	0	79	1013	3
6	1	30	30	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	98	10	296	3	0	0	79	1013	0
6	1	30	30	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	295.9	3	0	0	84	1013	3
6	1	31	31	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	295.8	3	0	0	84	1012	3
6	1	31	31	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	113	10	295.4	3	0	0	90	1012	3
6	1	31	31	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	295.4	3	0	0	93	1011	3
6	1	31	31	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	295.4	3	0	0	93	1012	3
6	1	31	31	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	295.4	3	0	0	97	1012	0
6	1	31	31	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	295.4	3	0	0	93	1012	3
6	1	31	31	7	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	75	10	298.4	3	0	0	93	1012	3
6	1	31	31	8	56.8	0.221	0.762	0.005	281	239	-17.1	0.655	0.64	0.33	1.1	79	10	300.5	3	0	0	87	1013	0
6	1	31	31	9	68.6	0.249	0.992	0.005	515	285	-20.3	0.37	0.38	0.22	1.6	93	10	302	3	0	0	77	1013	0
6	1	31	31	10	103.1	0.292	1.32	0.005	807	363	-21.8	0.37	0.38	0.2	1.9	106	10	303	3	0	0	67	1013	0
6	1	31	31	11	119.7	0.318	1.435	0.005	892	412	-24.2	0.37	0.38	0.19	2.1	114	10	303.9	3	0	0	57	1013	0
6	1	31	31	12	92.8	0.278	1.35	0.005	958	338	-21	0.37	0.38	0.19	1.8	102	10	303.5	3	0	0	54	1012	8
6	1	31	31	13	108	0.304	1.458	0.005	1036	386	-23.6	0.37	0.38	0.19	2	105	10	304	3	0	0	52	1012	7
6	1	31	31	14	77.7	0.273	1.329	0.005	1091	329	-23.7	0.37	0.38	0.19	1.8	104	10	303.6	3	0	0	50	1010	8
6	1	31	31	15	66.1	0.28	1.277	0.005	1138	341	-30	0.37	0.38	0.19	1.9	104	10	303.4	3	0	0	54	1010	9
6	1	31	31	16	32.6	0.265	1.016	0.005	1159	313	-51.3	0.37	0.38	0.2	1.9	104	10	302.4	3	0	0	58	1010	9
6	1	31	31	17	9.3	0.223	0.669	0.005	1163	243	-108.4	0.37	0.38	0.25	1.7	97	10	301	3	0	0	63	1010	10
6	1	31	31	18	0.1	0.177	0.148	0.005	1160	171	-4963.4	0.655	0.64	0.43	1.2	85	10	299	3	0	0	74	1011	3
6	1	31	31	19	-2.3	0.055	-9	-9	-999	44	6.3	0.37	0.38	1	0.9	90	10	298.1	3	0	0	79	1011	3
6	1	31	31	20	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	84	10	297.8	3	0	0	79	1012	0
6	1	31	31	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	75	10	297.4	3	0	0	79	1012	3
6	1	31	31	22	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	82	10	297	3	0	0	90	1012	3
6	1	31	31	23	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	70	10	296.8	3	0	0	90	1012	3
6	1	31	31	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	63	10	296.4	3	0	0	90	1012	3
6	2	1	32	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	296.4	3	0	0	94	1012	3
6	2	1	32	2	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	296.8	3	0	0	94	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	1	32	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	296.2	3	0	0	94	1010	3
6	2	1	32	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	296.1	3	0	0	97	1010	3
6	2	1	32	5	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	79	10	295.9	3	0	0	87	1011	3
6	2	1	32	6	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	99	10	296.4	3	0	0	90	1011	3
6	2	1	32	7	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	61	10	298.9	3	0	0	90	1012	3
6	2	1	32	8	28.7	0.246	0.52	0.005	177	280	-46.8	0.562	0.7	0.33	1.5	76	10	300.2	3	0	0	82	1013	0
6	2	1	32	9	68.4	0.303	0.879	0.005	359	384	-36.7	0.562	0.7	0.22	1.8	85	10	300.9	3	0	0	74	1013	8
6	2	1	32	10	99.3	0.283	1.197	0.005	625	346	-20.5	0.212	0.48	0.19	2.2	96	10	302.5	3	0	0.76	72	1013	6
6	2	1	32	11	142.3	0.321	1.501	0.005	859	417	-20.9	0.212	0.48	0.18	2.5	108	10	303.6	3	0	0	65	1013	4
6	2	1	32	12	131.2	0.309	1.516	0.005	961	395	-20.3	0.212	0.48	0.18	2.4	101	10	304.1	3	0	0	64	1012	7
6	2	1	32	13	113.3	0.324	1.487	0.005	1048	424	-27.1	0.212	0.48	0.18	2.6	112	10	303.9	3	0	0	63	1011	8
6	2	1	32	14	84.7	0.288	1.377	0.005	1113	356	-25.5	0.212	0.48	0.18	2.3	106	10	303.4	3	0	0	57	1010	9
6	2	1	32	15	57.3	0.27	1.226	0.005	1157	323	-31	0.212	0.48	0.18	2.2	106	10	302.8	3	0	0	59	1010	9
6	2	1	32	16	41.6	0.245	1.112	0.005	1188	279	-31.8	0.212	0.48	0.2	2	115	10	302.4	3	0	0	63	1010	9
6	2	1	32	17	5.4	0.179	0.562	0.005	1189	176	-96.8	0.212	0.48	0.24	1.6	100	10	300.6	3	0	0	74	1010	10
6	2	1	32	18	0.1	0.136	0.149	0.005	1187	115	-2242.6	0.212	0.48	0.43	1.3	93	10	299.5	3	0	0	74	1010	3
6	2	1	32	19	-2.7	0.057	-9	-9	-999	34	6.1	0.212	0.48	1	1.1	106	10	298.4	3	0	0	82	1010	3
6	2	1	32	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	90	10	298.1	3	0	0	85	1011	7
6	2	1	32	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	88	10	298	3	0	0	88	1012	3
6	2	1	32	22	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	82	10	297.8	3	0	0	88	1012	3
6	2	1	32	23	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	83	10	297.5	3	0	0	88	1012	3
6	2	1	32	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	297.2	3	0	0	94	1011	3
6	2	2	33	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	65	10	296.9	3	0	0	94	1011	3
6	2	2	33	2	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	84	10	297	3	0	0	94	1010	3
6	2	2	33	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	77	10	296.8	3	0	0	94	1010	3
6	2	2	33	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	89	10	296.5	3	0	0	94	1010	3
6	2	2	33	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	101	10	296.4	3	0	0	94	1011	3
6	2	2	33	6	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	296.9	3	0	0	94	1011	3
6	2	2	33	7	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	106	10	298.8	3	0	0	94	1012	3
6	2	2	33	8	33.6	0.222	0.6	0.005	231	241	-29.5	0.212	0.48	0.33	1.8	101	10	300.5	3	0	0	82	1013	0
6	2	2	33	9	83.2	0.269	1.097	0.005	574	321	-21.1	0.212	0.48	0.22	2.1	99	10	302.4	3	0	0	72	1013	0
6	2	2	33	10	102.4	0.302	1.344	0.005	857	382	-24.4	0.212	0.48	0.19	2.4	109	10	302.9	3	0	0	67	1013	6
6	2	2	33	11	75.1	0.257	1.246	0.005	931	301	-20.4	0.212	0.48	0.18	2	124	10	302.2	3	0	0	65	1012	9
6	2	2	33	12	147.5	0.331	1.64	0.006	1080	438	-22.2	0.212	0.48	0.18	2.6	113	10	304.1	3	0	0	63	1012	6
6	2	2	33	13	101.2	0.293	1.49	0.008	1180	365	-22.3	0.212	0.48	0.18	2.3	102	10	303.5	3	0	0	63	1011	8
6	2	2	33	14	75.6	0.295	1.38	0.009	1255	369	-30.6	0.212	0.48	0.18	2.4	100	10	302.9	3	0	0	59	1010	9
6	2	2	33	15	78.3	0.315	1.426	0.009	1333	406	-35.8	0.212	0.48	0.18	2.6	111	10	303.1	3	0	0	72	1009	9
6	2	2	33	16	49.2	0.267	1.236	0.009	1382	318	-34.8	0.212	0.48	0.2	2.2	112	10	302.9	3	0	0	67	1009	9
6	2	2	33	17	4.1	0.196	0.54	0.009	1381	201	-166.5	0.212	0.48	0.24	1.8	104	10	300.9	3	0	0	74	1010	10
6	2	2	33	18	0.1	0.146	0.157	0.009	1377	128	-2792.8	0.212	0.48	0.43	1.4	106	10	299.4	3	0	0	77	1010	7
6	2	2	33	19	-2.4	0.057	-9	-9	-999	35	6.9	0.212	0.48	1	1.1	93	10	298.5	3	0	0	82	1010	7
6	2	2	33	20	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	66	10	297.9	3	0	0	85	1011	7
6	2	2	33	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	297.5	3	0	0	88	1012	7
6	2	2	33	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	53	10	297.2	3	0	0	82	1012	7
6	2	2	33	23	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	45	10	297	3	0	0	85	1012	0
6	2	2	33	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	75	10	297.1	3	0	0	85	1012	7
6	2	3	34	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	64	10	296.9	3	0	0	85	1012	7
6	2	3	34	2	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	77	10	296.5	3	0	0	82	1011	0
6	2	3	34	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	66	10	296.2	3	0	0	85	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	3	34	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	50	10	296.1	3	0	0	85	1011	7
6	2	3	34	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	66	10	296.4	3	0	0	82	1011	7
6	2	3	34	6	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	90	10	296.4	3	0	0	90	1012	7
6	2	3	34	7	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	73	10	298.9	3	0	0	90	1012	7
6	2	3	34	8	43.6	0.217	-9	-9	-999	233	-21.3	0.212	0.48	0.33	1.7	91	10	300.9	3	0	0	77	1013	0
6	2	3	34	9	97.4	0.339	-9	-9	-999	453	-36	0.212	0.48	0.22	2.8	99	10	302.2	3	0	0	72	1013	0
6	2	3	34	10	124.1	0.354	-9	-9	-999	485	-32.4	0.212	0.48	0.19	2.9	104	10	303	3	0	0	59	1013	0
6	2	3	34	11	132.1	0.318	-9	-9	-999	414	-22.1	0.212	0.48	0.18	2.5	93	10	303.8	3	0	0	65	1013	6
6	2	3	34	12	139.9	0.339	-9	-9	-999	454	-25.1	0.212	0.48	0.18	2.7	95	10	303.8	3	0	0	48	1012	6
6	2	3	34	13	144.7	0.321	-9	-9	-999	419	-20.6	0.212	0.48	0.18	2.5	93	10	304.2	3	0	0	51	1011	6
6	2	3	34	14	123.6	0.307	-9	-9	-999	392	-21.2	0.212	0.48	0.18	2.4	87	10	303.9	3	0	0	50	1011	7
6	2	3	34	15	109.2	0.354	-9	-9	-999	484	-36.5	0.562	0.7	0.18	2.1	78	10	303.5	3	0	0	48	1010	8
6	2	3	34	16	67.8	0.365	-9	-9	-999	507	-64.5	0.562	0.7	0.19	2.3	84	10	302.4	3	0	0	46	1010	9
6	2	3	34	17	15.5	0.26	-9	-9	-999	309	-101.6	0.562	0.7	0.24	1.7	79	10	300.4	3	0	0	55	1010	10
6	2	3	34	18	0.1	0.167	-9	-9	-999	160	-4221	0.562	0.7	0.43	1.2	76	10	298.4	3	0	0	56	1011	7
6	2	3	34	19	-3.1	0.069	-9	-9	-999	47	9.7	0.562	0.7	1	1	80	10	297.4	3	0	0	65	1011	7
6	2	3	34	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	116	10	296.4	3	0	0	69	1012	7
6	2	3	34	21	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	113	10	295.9	3	0	0	74	1012	7
6	2	3	34	22	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	124	10	295.2	3	0	0	79	1012	7
6	2	3	34	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	124	10	295.1	3	0	0	79	1012	7
6	2	3	34	24	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	92	10	294.8	3	0	0	87	1012	7
6	2	4	35	1	-1	0.036	-9	-9	-999	16	4.3	0.212	0.48	1	0.7	104	10	294.5	3	0	0	87	1011	7
6	2	4	35	2	-1	0.036	-9	-9	-999	16	4.3	0.212	0.48	1	0.7	95	10	294.4	3	0	0	90	1011	7
6	2	4	35	3	-1	0.036	-9	-9	-999	16	4.3	0.212	0.48	1	0.7	92	10	294.4	3	0	0	93	1010	7
6	2	4	35	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	103	10	294.4	3	0	0	93	1010	7
6	2	4	35	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	71	10	295.1	3	0	0	90	1011	7
6	2	4	35	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	73	10	294.9	3	0	0	93	1012	7
6	2	4	35	7	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	296.8	3	0	0	87	1013	7
6	2	4	35	8	29.7	0.154	-9	-9	-999	139	-11.1	0.212	0.48	0.33	1.1	92	10	299.5	3	0	0	77	1013	0
6	2	4	35	9	90.1	0.223	-9	-9	-999	243	-11.2	0.212	0.48	0.22	1.6	96	10	301.9	3	0	0	67	1013	0
6	2	4	35	10	108.2	0.285	-9	-9	-999	350	-19.3	0.212	0.48	0.19	2.2	106	10	302.9	3	0	0	55	1013	5
6	2	4	35	11	94.7	0.253	-9	-9	-999	294	-15.5	0.212	0.48	0.18	1.9	97	10	302.9	3	0	0	53	1013	8
6	2	4	35	12	118.9	0.287	-9	-9	-999	354	-18	0.212	0.48	0.18	2.2	106	10	303.2	3	0	0	59	1012	8
6	2	4	35	13	108.4	0.275	-9	-9	-999	333	-17.4	0.212	0.48	0.18	2.1	108	10	303	3	0	0	48	1012	8
6	2	4	35	14	80	0.249	-9	-9	-999	286	-17.4	0.212	0.48	0.18	1.9	108	10	302.8	3	0	0	59	1011	9
6	2	4	35	15	61.5	0.262	-9	-9	-999	309	-26.5	0.212	0.48	0.18	2.1	102	10	302.1	3	0	0	51	1010	9
6	2	4	35	16	28	0.228	-9	-9	-999	251	-38.3	0.212	0.48	0.19	1.9	108	10	301	3	0	0	59	1010	10
6	2	4	35	17	5	0.169	-9	-9	-999	160	-87.6	0.212	0.48	0.24	1.5	111	10	299.6	3	0	0	65	1010	10
6	2	4	35	18	0.1	0.105	-9	-9	-999	79	-1036.7	0.212	0.48	0.42	1	96	10	298.4	3	0	0	79	1011	7
6	2	4	35	19	-1.6	0.047	-9	-9	-999	24	5.6	0.212	0.48	1	0.9	99	10	297.5	3	0	0	79	1011	7
6	2	4	35	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	82	10	296.9	3	0	0	74	1011	7
6	2	4	35	21	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	84	10	296.4	3	0	0	84	1012	7
6	2	4	35	22	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	78	10	295.9	3	0	0	100	1012	7
6	2	4	35	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	295.8	3	0	0	93	1012	7
6	2	4	35	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	110	10	295.8	3	0	0	93	1012	7
6	2	5	36	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	295.5	3	0	0	93	1011	7
6	2	5	36	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	295.8	3	0	0	97	1011	7
6	2	5	36	3	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	91	10	295.8	3	0	0	93	1011	0
6	2	5	36	4	-0.8	0.031	-9	-9	-999	13	3.2	0.212	0.48	1	0.6	97	10	295.2	3	0	0	93	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	5	36	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	80	10	294.9	3	0	0	100	1012	0
6	2	5	36	6	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	64	10	295	3	0	0	93	1013	0
6	2	5	36	7	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	83	10	296.6	3	0	0	90	1013	0
6	2	5	36	8	49.3	0.239	-9	-9	-999	268	-24.9	0.212	0.48	0.33	1.9	86	10	299.8	3	0	0	79	1014	0
6	2	5	36	9	70.2	0.237	-9	-9	-999	265	-17.1	0.212	0.48	0.22	1.8	101	10	300.4	3	0	0	69	1015	4
6	2	5	36	10	76.8	0.267	-9	-9	-999	317	-22.4	0.212	0.48	0.19	2.1	95	10	301.1	3	0	0	65	1015	8
6	2	5	36	11	107.3	0.257	-9	-9	-999	299	-14.2	0.212	0.48	0.18	1.9	108	10	301.1	3	0	0	67	1014	8
6	2	5	36	12	112.6	0.28	-9	-9	-999	341	-17.6	0.562	0.7	0.18	1.5	79	10	301.9	3	0	0	79	1014	9
6	2	5	36	13	60.9	0.238	-9	-9	-999	267	-20	0.562	0.7	0.18	1.3	85	10	300.9	3	0	0	65	1013	10
6	2	5	36	14	44.5	0.177	-9	-9	-999	172	-11.2	0.687	0.8	0.18	0.8	170	10	299.9	3	0	0	65	1012	10
6	2	5	36	15	22	0.12	-9	-9	-999	96	-7.1	0.212	0.48	0.18	0.8	109	10	299.8	3	0	3.81	74	1012	10
6	2	5	36	16	18.3	0.127	-9	-9	-999	105	-10.2	0.212	0.48	0.19	0.9	108	10	298.8	3	0	0.25	65	1012	10
6	2	5	36	17	0.1	0.105	-9	-9	-999	78	-991	0.212	0.48	0.24	1	108	10	297.9	3	0	0	63	1012	10
6	2	5	36	18	0.1	0.126	-9	-9	-999	103	-1804.5	0.562	0.7	0.42	0.9	80	10	297.5	3	0	0	69	1012	3
6	2	5	36	19	-1.7	0.049	-9	-9	-999	27	6	0.562	0.7	1	0.7	84	10	297	3	0	0	74	1013	3
6	2	5	36	20	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	59	10	296.4	3	0	0	74	1013	0
6	2	5	36	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	295.8	3	0	0	84	1013	7
6	2	5	36	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	295.5	3	0	0	84	1013	7
6	2	5	36	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	97	10	295.4	3	0	0	87	1013	0
6	2	5	36	24	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	101	10	295.5	3	0	0	87	1013	7
6	2	6	37	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	94	10	295.9	3	0	0	87	1012	7
6	2	6	37	2	-2.5	0.057	-9	-9	-999	31	6.8	0.212	0.48	1	1.1	95	10	295.4	3	0	0.76	87	1012	7
6	2	6	37	3	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	68	10	295.1	3	0	0	90	1011	3
6	2	6	37	4	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	72	10	295.2	3	0	0	100	1011	7
6	2	6	37	5	-3.1	0.069	-9	-9	-999	42	9.6	0.562	0.7	1	1	65	10	295.4	3	0	0.25	90	1012	7
6	2	6	37	6	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	80	10	295.4	3	0	0.25	100	1012	3
6	2	6	37	7	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	65	10	295.9	3	0	0.76	100	1013	7
6	2	6	37	8	21.4	0.191	-9	-9	-999	192	-29.3	0.562	0.7	0.33	1.1	82	10	297.6	3	0	0	94	1014	0
6	2	6	37	9	76.8	0.231	-9	-9	-999	256	-14.6	0.562	0.7	0.22	1.2	85	10	299.9	3	0	0.25	85	1014	7
6	2	6	37	10	103.1	0.256	-9	-9	-999	297	-14.6	0.212	0.48	0.19	1.9	117	10	301.1	3	0	0	79	1014	6
6	2	6	37	11	119.1	0.316	-9	-9	-999	408	-23.9	0.212	0.48	0.18	2.5	122	10	301.1	3	0	0	74	1014	7
6	2	6	37	12	122.6	0.298	-9	-9	-999	374	-19.4	0.212	0.48	0.18	2.3	113	10	301.8	3	0	0	74	1013	7
6	2	6	37	13	80.3	0.24	-9	-9	-999	272	-15.6	0.212	0.48	0.18	1.8	115	10	299.9	3	0	2.29	74	1012	9
6	2	6	37	14	88.7	0.27	-9	-9	-999	324	-20.1	0.212	0.48	0.18	2.1	93	10	302.2	3	0	0	72	1011	9
6	2	6	37	15	75	0.267	-9	-9	-999	317	-22.8	0.212	0.48	0.18	2.1	113	10	302.4	3	0	0	63	1011	9
6	2	6	37	16	25.1	0.217	-9	-9	-999	233	-36.8	0.212	0.48	0.19	1.8	109	10	301	3	0	0	59	1011	10
6	2	6	37	17	3.7	0.196	-9	-9	-999	199	-182.8	0.212	0.48	0.24	1.8	93	10	299.9	3	0	0	67	1012	10
6	2	6	37	18	0.1	0.136	-9	-9	-999	115	-2245.5	0.212	0.48	0.42	1.3	86	10	298.4	3	0	0	60	1012	3
6	2	6	37	19	-2.8	0.063	-9	-9	-999	38	7.7	0.562	0.7	1	0.9	82	10	297.6	3	0	0	85	1012	3
6	2	6	37	20	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	68	10	297.4	3	0	0	85	1013	3
6	2	6	37	21	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	66	10	296.8	3	0	0	84	1013	3
6	2	6	37	22	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	74	10	296.2	3	0	0	97	1013	3
6	2	6	37	23	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	72	10	295.9	3	0	0	97	1013	3
6	2	6	37	24	-6	0.09	-9	-9	-999	62	11.2	0.562	0.7	1	1.3	58	10	295.8	3	0	0	84	1012	3
6	2	7	38	1	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	68	10	295.8	3	0	0	90	1012	3
6	2	7	38	2	-2.9	0.063	-9	-9	-999	36	7.5	0.562	0.7	1	0.9	70	10	295.1	3	0	0	90	1011	0
6	2	7	38	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	91	10	294.9	3	0	0	73	1011	3
6	2	7	38	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	88	10	294.8	3	0	0	93	1011	3
6	2	7	38	5	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	64	10	294.6	3	0	0	97	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	7	38	6	-4.3	0.076	-9	-9	-999	49	9.4	0.562	0.7	1	1.1	56	10	294.8	3	0	0	93	1012	3
6	2	7	38	7	-7.9	0.104	-9	-9	-999	77	12.9	0.562	0.7	1	1.5	67	10	297.9	3	0	0	93	1013	3
6	2	7	38	8	59.7	0.361	0.774	0.005	281	499	-71.3	0.562	0.7	0.33	2.3	81	10	299.5	3	0	0	79	1014	0
6	2	7	38	9	120	0.344	1.293	0.005	652	465	-30.7	0.562	0.7	0.22	2	85	10	301.4	3	0	0	67	1014	0
6	2	7	38	10	125.5	0.289	1.445	0.005	871	358	-17.3	0.212	0.48	0.19	2.2	90	10	302.8	3	0	0	59	1014	0
6	2	7	38	11	149.3	0.331	1.629	0.005	1049	439	-22	0.212	0.48	0.18	2.6	94	10	303.2	3	0	0	59	1013	0
6	2	7	38	12	147.3	0.312	1.709	0.005	1225	401	-18.6	0.212	0.48	0.18	2.4	95	10	303.6	3	0	0	55	1012	6
6	2	7	38	13	113.1	0.267	1.621	0.005	1359	319	-15.3	0.212	0.48	0.18	2	88	10	303.4	3	0	0	51	1012	8
6	2	7	38	14	125.1	0.289	1.736	0.005	1510	357	-17.3	0.212	0.48	0.18	2.2	88	10	303.9	3	0	0	48	1011	7
6	2	7	38	15	91.8	0.29	1.583	0.005	1560	359	-24	0.212	0.48	0.18	2.3	102	10	303.4	3	0	0	51	1010	8
6	2	7	38	16	53.5	0.278	1.331	0.005	1588	337	-36.2	0.212	0.48	0.19	2.3	105	10	302.5	3	0	0	51	1010	9
6	2	7	38	17	11	0.196	0.785	0.005	1590	202	-62	0.212	0.48	0.24	1.7	95	10	300.6	3	0	0	55	1011	10
6	2	7	38	18	0.1	0.125	0.164	0.005	1586	103	-1771.7	0.212	0.48	0.42	1.2	88	10	298.6	3	0	0	60	1011	3
6	2	7	38	19	-1.5	0.042	-9	-9	-999	24	4.4	0.212	0.48	1	0.8	86	10	297.4	3	0	0	69	1012	3
6	2	7	38	20	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	87	10	296.8	3	0	0	76	1012	0
6	2	7	38	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	296.2	3	0	0	79	1013	3
6	2	7	38	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	88	10	295.9	3	0	0	93	1013	3
6	2	7	38	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	103	10	295.4	3	0	0	82	1013	3
6	2	7	38	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	95	10	295.2	3	0	0	87	1012	3
6	2	8	39	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	295.2	3	0	0	87	1012	3
6	2	8	39	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	81	10	295.2	3	0	0	93	1011	0
6	2	8	39	3	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	88	10	295.4	3	0	1.52	100	1011	3
6	2	8	39	4	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	80	10	295.8	3	0	0.51	93	1011	3
6	2	8	39	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	68	10	295.5	3	0	0	97	1012	3
6	2	8	39	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	90	10	295.1	3	0	0	100	1012	3
6	2	8	39	7	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	108	10	297.9	3	0	0	87	1013	3
6	2	8	39	8	19.1	0.25	0.264	0.006	35	288	-74.5	0.212	0.48	0.33	2.2	115	10	296.9	3	0	0	87	1014	7
6	2	8	39	9	74	0.238	0.705	0.006	171	267	-16.5	0.212	0.48	0.22	1.8	106	10	300.4	3	0	0	85	1014	0
6	2	8	39	10	116.5	0.249	1.077	0.005	388	286	-12	0.212	0.48	0.19	1.8	102	10	302.4	3	0	0	67	1014	0
6	2	8	39	11	146.6	0.274	1.39	0.005	663	331	-12.7	0.212	0.48	0.18	2	111	10	303.9	3	0	0	53	1013	0
6	2	8	39	12	158.2	0.257	1.773	0.006	1275	299	-9.7	0.212	0.48	0.18	1.8	106	10	304.5	3	0	0	45	1013	5
6	2	8	39	13	122.5	0.26	1.649	0.006	1322	305	-13	0.212	0.48	0.18	1.9	103	10	304.2	3	0	0	51	1012	8
6	2	8	39	14	122.3	0.26	1.668	0.006	1369	305	-13	0.212	0.48	0.18	1.9	100	10	304.4	3	0	0	55	1011	7
6	2	8	39	15	92.2	0.253	1.531	0.006	1405	292	-15.8	0.212	0.48	0.18	1.9	109	10	304.1	3	0	0	51	1010	8
6	2	8	39	16	51	0.249	1.263	0.006	1423	286	-27.3	0.212	0.48	0.19	2	117	10	303.4	3	0	0	55	1010	9
6	2	8	39	17	11.2	0.196	0.762	0.006	1425	201	-60.9	0.212	0.48	0.24	1.7	113	10	301.1	3	0	0	59	1011	10
6	2	8	39	18	0.1	0.105	0.158	0.006	1422	81	-1037	0.212	0.48	0.42	1	106	10	298.9	3	0	0	65	1011	3
6	2	8	39	19	-1.5	0.042	-9	-9	-999	21	4.4	0.212	0.48	1	0.8	104	10	297.8	3	0	0	79	1012	3
6	2	8	39	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	89	10	297.2	3	0	0	82	1012	0
6	2	8	39	21	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	91	10	296.9	3	0	0	84	1013	3
6	2	8	39	22	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	72	10	296.4	3	0	0	97	1013	3
6	2	8	39	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	64	10	296	3	0	0	87	1013	3
6	2	8	39	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	295.6	3	0	0	90	1013	3
6	2	9	40	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	77	10	295.5	3	0	0	90	1012	3
6	2	9	40	2	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	65	10	295.4	3	0	0	93	1012	7
6	2	9	40	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	66	10	295	3	0	0	97	1012	3
6	2	9	40	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	295	3	0	0	97	1012	7
6	2	9	40	5	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	84	10	294.9	3	0	0	97	1013	7
6	2	9	40	6	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	94	10	295.6	3	0	0	97	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	9	40	7	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	90	10	298.6	3	0	0	97	1014	3
6	2	9	40	8	49	0.22	0.674	0.005	226	237	-19.6	0.212	0.48	0.33	1.7	99	10	300.9	3	0	0	82	1015	0
6	2	9	40	9	102	0.312	1.119	0.005	498	400	-26.9	0.212	0.48	0.22	2.5	111	10	302.2	3	0	0	72	1015	0
6	2	9	40	10	139.2	0.32	1.474	0.005	834	416	-21.3	0.212	0.48	0.19	2.5	117	10	303.5	3	0	0	67	1015	0
6	2	9	40	11	145.6	0.302	1.573	0.005	970	382	-17.1	0.212	0.48	0.18	2.3	111	10	304.1	3	0	0	63	1015	4
6	2	9	40	12	140.3	0.292	1.621	0.005	1100	363	-16.1	0.212	0.48	0.18	2.2	110	10	304.4	3	0	0	55	1014	7
6	2	9	40	13	110.4	0.285	1.542	0.006	1202	351	-19	0.212	0.48	0.18	2.2	98	10	304	3	0	0	59	1013	8
6	2	9	40	14	89	0.261	1.467	0.007	1282	307	-18	0.212	0.48	0.18	2	87	10	302.9	3	0	0	57	1013	9
6	2	9	40	15	73.9	0.266	1.403	0.008	1351	316	-23	0.212	0.48	0.18	2.1	96	10	303.1	3	0	0	55	1012	9
6	2	9	40	16	40.3	0.263	1.156	0.008	1386	310	-40.7	0.212	0.48	0.19	2.2	96	10	302.4	3	0	0	63	1012	9
6	2	9	40	17	10.9	0.215	0.75	0.008	1391	230	-82	0.212	0.48	0.24	1.9	105	10	300.5	3	0	0	65	1012	10
6	2	9	40	18	0.1	0.125	0.157	0.008	1387	104	-1774.1	0.212	0.48	0.41	1.2	95	10	299	3	0	0	69	1013	7
6	2	9	40	19	-2.4	0.057	-9	-9	-999	33	6.9	0.212	0.48	1	1.1	97	10	298	3	0	0	79	1013	7
6	2	9	40	20	-3.4	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	108	10	297.4	3	0	0	79	1014	0
6	2	9	40	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	64	10	296.9	3	0	0	84	1014	7
6	2	9	40	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	78	10	296.5	3	0	0	90	1015	3
6	2	9	40	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	62	10	296.8	3	0	0	84	1015	7
6	2	9	40	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	61	10	296.8	3	0	0	90	1014	7
6	2	10	41	1	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	55	10	296.9	3	0	0	79	1014	7
6	2	10	41	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	50	10	296.8	3	0	0	76	1013	7
6	2	10	41	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	296.6	3	0	0	69	1013	7
6	2	10	41	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	58	10	296.6	3	0	0	84	1013	7
6	2	10	41	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	296.6	3	0	0	79	1014	7
6	2	10	41	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.4	3	0	0	84	1015	7
6	2	10	41	7	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	38	10	297.4	3	0	0	79	1015	3
6	2	10	41	8	35	0.225	0.604	0.005	227	246	-29.6	0.562	0.7	0.32	1.3	54	10	299.4	3	0	0	69	1016	0
6	2	10	41	9	86.3	0.232	1.056	0.005	495	257	-13.1	0.212	0.48	0.21	1.7	96	10	302.2	3	0	0	67	1017	0
6	2	10	41	10	114.3	0.249	1.414	0.009	899	285	-12.2	0.212	0.48	0.19	1.8	98	10	302.9	3	0	0	63	1017	5
6	2	10	41	11	144.2	0.244	1.644	0.01	1119	278	-9.2	0.212	0.48	0.18	1.7	96	10	304.1	3	0	0	53	1017	5
6	2	10	41	12	147.7	0.255	1.685	0.009	1175	296	-10.2	0.212	0.48	0.18	1.8	101	10	304.4	3	0	0	55	1016	6
6	2	10	41	13	85.1	0.173	1.415	0.009	1206	167	-5.5	0.212	0.48	0.18	1.1	91	10	304	3	0	0	51	1015	9
6	2	10	41	14	90.8	0.137	1.454	0.008	1226	117	-2.6	0.562	0.7	0.18	0.5	50	10	303.6	3	0	0	50	1014	9
6	2	10	41	15	53.4	0.164	1.223	0.008	1238	153	-7.5	0.212	0.48	0.18	1.1	100	10	303.5	3	0	0	51	1013	10
6	2	10	41	16	10.8	0.186	0.719	0.008	1239	185	-54	0.212	0.48	0.19	1.6	97	10	301.9	3	0	0	59	1013	10
6	2	10	41	17	0.1	0.187	0.151	0.008	1238	186	-5924.3	0.212	0.48	0.24	1.8	97	10	300.2	3	0	0	61	1014	10
6	2	10	41	18	0.1	0.125	0.151	0.008	1237	103	-1776.4	0.212	0.48	0.41	1.2	106	10	298.8	3	0	0	65	1014	3
6	2	10	41	19	-2.8	0.057	-9	-9	-999	33	6.1	0.212	0.48	1	1.1	96	10	297.8	3	0	0	69	1014	3
6	2	10	41	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	90	10	297	3	0	0	74	1015	0
6	2	10	41	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	88	10	296.4	3	0	0	74	1015	3
6	2	10	41	22	-1.9	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	295.9	3	0	0	84	1015	3
6	2	10	41	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	87	10	295.6	3	0	0	87	1015	0
6	2	10	41	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	295.4	3	0	0	87	1015	3
6	2	11	42	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	295.1	3	0	0	87	1014	3
6	2	11	42	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	87	10	294.9	3	0	0	90	1013	0
6	2	11	42	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	72	10	294.8	3	0	0	93	1013	3
6	2	11	42	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	85	10	294.6	3	0	0	93	1014	3
6	2	11	42	5	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	63	10	294.2	3	0	0	93	1014	0
6	2	11	42	6	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	44	10	294.1	3	0	0	93	1015	3
6	2	11	42	7	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	42	10	297.5	3	0	0	93	1015	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	11	42	8	47.8	0.162	0.61	0.007	172	150	-8.1	0.212	0.48	0.32	1.1	87	10	300.5	3	0	0	82	1016	0
6	2	11	42	9	65.6	0.226	0.764	0.005	246	247	-15.9	0.212	0.48	0.21	1.7	107	10	301.8	3	0	0	72	1016	6
6	2	11	42	10	108.4	0.257	1.033	0.005	369	299	-14.2	0.212	0.48	0.19	1.9	110	10	302.6	3	0	0	63	1016	6
6	2	11	42	11	126.1	0.298	1.431	0.005	843	375	-19	0.212	0.48	0.18	2.3	101	10	303.2	3	0	0	59	1015	7
6	2	11	42	12	121.9	0.316	1.466	0.005	937	409	-23.5	0.212	0.48	0.18	2.5	107	10	303.2	3	0	0	55	1015	8
6	2	11	42	13	137	0.338	1.58	0.005	1043	452	-25.5	0.212	0.48	0.18	2.7	106	10	303.5	3	0	0	59	1014	7
6	2	11	42	14	101.1	0.293	1.463	0.005	1121	365	-22.4	0.212	0.48	0.18	2.3	103	10	303.4	3	0	0	47	1013	8
6	2	11	42	15	69.3	0.274	1.31	0.005	1174	331	-26.9	0.212	0.48	0.18	2.2	94	10	302.6	3	0	0	59	1013	9
6	2	11	42	16	23.2	0.253	0.92	0.005	1214	293	-63.4	0.212	0.48	0.19	2.2	120	10	299.9	3	0	0	79	1013	10
6	2	11	42	17	2	0.143	0.404	0.005	1212	130	-135.3	0.212	0.48	0.24	1.3	120	10	298.9	3	0	0	72	1013	10
6	2	11	42	18	0.1	0.084	0.15	0.005	1203	57	-544.7	0.212	0.48	0.41	0.8	110	10	297.6	3	0	0	65	1013	7
6	2	11	42	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	107	10	297.4	3	0	0	79	1014	7
6	2	11	42	20	-3.4	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	91	10	297.4	3	0	0	79	1015	0
6	2	11	42	21	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	73	10	296.8	3	0	0	79	1015	3
6	2	11	42	22	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	77	10	296	3	0	0	87	1015	3
6	2	11	42	23	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	87	10	295.9	3	0	0	90	1015	7
6	2	11	42	24	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	122	10	295.9	3	0	0	97	1015	3
6	2	12	43	1	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	77	10	295.6	3	0	0	97	1014	7
6	2	12	43	2	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	86	10	295.6	3	0	0	97	1014	7
6	2	12	43	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	60	10	295.4	3	0	0	100	1013	3
6	2	12	43	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	134	10	295.5	3	0	0.25	93	1014	3
6	2	12	43	5	-2.5	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	109	10	295.9	3	0	0	97	1014	7
6	2	12	43	6	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	105	10	296	3	0	0	97	1015	7
6	2	12	43	7	-5.3	0.09	-9	-9	-999	62	12.6	0.562	0.7	1	1.3	77	10	296.9	3	0	0	100	1015	7
6	2	12	43	8	53.6	0.272	0.744	0.005	278	326	-34	0.562	0.7	0.32	1.6	83	10	298.5	3	0	0	90	1016	0
6	2	12	43	9	71.7	0.247	0.913	0.005	385	282	-18.9	0.212	0.48	0.21	1.9	102	10	300.9	3	0	0	79	1016	1
6	2	12	43	10	97.7	0.311	1.127	0.005	531	398	-27.8	0.212	0.48	0.19	2.5	119	10	301.6	3	0	0	72	1016	7
6	2	12	43	11	136.3	0.329	1.517	0.005	929	433	-23.6	0.212	0.48	0.18	2.6	116	10	303	3	0	0	70	1015	6
6	2	12	43	12	123.4	0.298	1.606	0.006	1217	374	-19.3	0.212	0.48	0.18	2.3	121	10	303.2	3	0	0	63	1015	8
6	2	12	43	13	108.5	0.304	1.572	0.006	1296	385	-23.3	0.212	0.48	0.18	2.4	117	10	303	3	0	0	72	1014	8
6	2	12	43	14	120.4	0.325	1.664	0.006	1385	427	-25.8	0.212	0.48	0.18	2.6	119	10	303.4	3	0	0	63	1013	7
6	2	12	43	15	81.3	0.288	1.475	0.006	1427	355	-26.4	0.212	0.48	0.18	2.3	103	10	302.9	3	0	0	59	1013	9
6	2	12	43	16	41.7	0.264	1.186	0.006	1443	311	-39.6	0.212	0.48	0.19	2.2	98	10	302.2	3	0	0	59	1013	9
6	2	12	43	17	9.7	0.195	0.729	0.006	1445	199	-68.8	0.212	0.48	0.23	1.7	103	10	300.8	3	0	0	57	1013	10
6	2	12	43	18	0.1	0.125	0.159	0.006	1443	103	-1775.2	0.212	0.48	0.41	1.2	91	10	298.9	3	0	0	65	1013	7
6	2	12	43	19	-2	0.052	-9	-9	-999	29	6.2	0.212	0.48	1	1	88	10	297.9	3	0	0	79	1014	7
6	2	12	43	20	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	87	10	296.9	3	0	0	87	1014	7
6	2	12	43	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	78	10	296.4	3	0	0	90	1015	7
6	2	12	43	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	79	10	295.9	3	0	0	97	1015	7
6	2	12	43	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	49	10	295.5	3	0	0	90	1015	7
6	2	12	43	24	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	59	10	295.1	3	0	0	84	1015	7
6	2	13	44	1	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	60	10	295	3	0	0	90	1014	7
6	2	13	44	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	75	10	295.5	3	0	0	90	1014	7
6	2	13	44	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	47	10	295.4	3	0	0	90	1013	7
6	2	13	44	4	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	98	10	296	3	0	0	97	1014	7
6	2	13	44	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	61	10	295.9	3	0	0	98	1014	7
6	2	13	44	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	54	10	295.4	3	0	0	100	1014	7
6	2	13	44	7	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	298.1	3	0	0	97	1015	7
6	2	13	44	8	24.3	0.198	0.46	0.007	145	203	-28.9	0.212	0.48	0.32	1.6	88	10	299.9	3	0	0	85	1016	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	13	44	9	55.9	0.241	0.713	0.006	235	272	-22.7	0.212	0.48	0.21	1.9	110	10	298.4	3	0	0	94	1017	8
6	2	13	44	10	111.8	0.276	1.087	0.005	417	334	-17.1	0.212	0.48	0.19	2.1	93	10	300.4	3	0	0	88	1017	5
6	2	13	44	11	78.5	0.258	1.056	0.005	544	302	-19.8	0.212	0.48	0.18	2	108	10	299.8	3	0	0.25	82	1016	9
6	2	13	44	12	127.4	0.308	1.386	0.005	758	393	-20.8	0.212	0.48	0.18	2.4	105	10	302.2	3	0	0	79	1015	7
6	2	13	44	13	112.8	0.352	1.394	0.005	869	480	-34.9	0.212	0.48	0.18	2.9	103	10	302.8	3	0	0	67	1014	8
6	2	13	44	14	108.4	0.332	1.418	0.005	952	440	-30.5	0.212	0.48	0.18	2.7	106	10	303	3	0	0	63	1013	8
6	2	13	44	15	82.7	0.307	1.323	0.005	1014	391	-31.5	0.212	0.48	0.18	2.5	106	10	302.9	3	0	0	63	1013	8
6	2	13	44	16	44.7	0.283	1.09	0.005	1047	347	-46	0.212	0.48	0.19	2.4	92	10	302.4	3	0	0	63	1013	9
6	2	13	44	17	8.1	0.212	0.618	0.005	1049	226	-105.7	0.212	0.48	0.23	1.9	99	10	300.4	3	0	0	67	1013	10
6	2	13	44	18	0.1	0.181	0.143	0.005	1046	177	-5370.3	0.562	0.7	0.4	1.3	79	10	298.9	3	0	0	67	1014	3
6	2	13	44	19	-2	0.056	-9	-9	-999	46	7.7	0.562	0.7	1	0.8	66	10	297.9	3	0	0	90	1014	7
6	2	13	44	20	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	79	10	297.2	3	0	0	94	1015	3
6	2	13	44	21	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	84	10	296.8	3	0	0	90	1015	3
6	2	13	44	22	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	86	10	296.4	3	0	0	90	1015	7
6	2	13	44	23	-2.5	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	89	10	296.2	3	0	0	87	1015	7
6	2	13	44	24	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	87	10	296.1	3	0	0	84	1015	3
6	2	14	45	1	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	75	10	295.9	3	0	0	90	1014	3
6	2	14	45	2	-2.9	0.063	-9	-9	-999	36	7.5	0.562	0.7	1	0.9	61	10	295.8	3	0	0	87	1013	0
6	2	14	45	3	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	64	10	295.6	3	0	0	90	1013	3
6	2	14	45	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	295.5	3	0	0	97	1013	3
6	2	14	45	5	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	67	10	295.5	3	0	0	90	1014	3
6	2	14	45	6	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	65	10	295.6	3	0	0	93	1014	3
6	2	14	45	7	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	66	10	298.5	3	0	0	97	1015	3
6	2	14	45	8	49.8	0.307	0.675	0.005	224	392	-52.8	0.562	0.7	0.32	1.9	74	10	299.8	3	0	0	88	1016	0
6	2	14	45	9	120.5	0.394	1.197	0.005	515	569	-46	0.562	0.7	0.21	2.4	83	10	301.5	3	0	0	79	1016	0
6	2	14	45	10	114.3	0.333	1.357	0.005	794	445	-29.4	0.212	0.48	0.19	2.7	87	10	302.8	3	0	0	67	1016	5
6	2	14	45	11	149.8	0.35	1.583	0.005	962	476	-26	0.212	0.48	0.18	2.8	95	10	303.5	3	0	0	61	1016	3
6	2	14	45	12	147.5	0.34	1.658	0.005	1121	457	-24.2	0.212	0.48	0.18	2.7	93	10	303.9	3	0	0	63	1015	6
6	2	14	45	13	124.3	0.307	1.614	0.006	1225	392	-21.1	0.212	0.48	0.18	2.4	102	10	301.8	3	0	1.27	63	1014	8
6	2	14	45	14	120.1	0.354	1.632	0.005	1311	483	-33.2	0.212	0.48	0.18	2.9	99	10	302.6	3	0	0	55	1014	8
6	2	14	45	15	89.6	0.299	1.503	0.006	1372	378	-27	0.212	0.48	0.18	2.4	102	10	301.9	3	0	0	63	1013	8
6	2	14	45	16	44.6	0.274	1.201	0.006	1403	331	-41.8	0.212	0.48	0.19	2.3	100	10	302	3	0	0	55	1013	9
6	2	14	45	17	5.3	0.227	0.59	0.006	1403	250	-200.8	0.212	0.48	0.23	2.1	90	10	300.2	3	0	0	63	1013	10
6	2	14	45	18	0.1	0.209	0.157	0.006	1400	220	-8223.4	0.562	0.7	0.4	1.5	84	10	298.9	3	0	0	60	1013	3
6	2	14	45	19	-3.5	0.069	-9	-9	-999	60	8.6	0.562	0.7	1	1	76	10	297.8	3	0	0	69	1014	3
6	2	14	45	20	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	73	10	297	3	0	0	79	1014	3
6	2	14	45	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	64	10	296.6	3	0	0	79	1015	3
6	2	14	45	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	53	10	296.6	3	0	0	84	1015	3
6	2	14	45	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	296.1	3	0	0	84	1015	3
6	2	14	45	24	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	77	10	295.6	3	0	0	93	1014	3
6	2	15	46	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	295.5	3	0	0	93	1013	3
6	2	15	46	2	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	295.5	3	0	0	93	1013	7
6	2	15	46	3	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	65	10	295.4	3	0	0	93	1012	3
6	2	15	46	4	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	62	10	295.4	3	0	0	100	1012	3
6	2	15	46	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	74	10	295.2	3	0	0	97	1013	7
6	2	15	46	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	57	10	295.4	3	0	0	97	1013	3
6	2	15	46	7	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	76	10	297.9	3	0	0	90	1014	3
6	2	15	46	8	21.2	0.158	0.484	0.005	193	145	-16.9	0.212	0.48	0.32	1.2	99	10	297.9	3	0	1.27	82	1015	0
6	2	15	46	9	58.9	0.205	0.792	0.005	305	213	-13.2	0.212	0.48	0.21	1.5	95	10	298.9	3	0	0	85	1015	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	15	46	10	102.9	0.265	1.126	0.005	503	314	-16.4	0.212	0.48	0.19	2	103	10	300.1	3	0	0	74	1015	6
6	2	15	46	11	88	0.261	1.179	0.005	673	306	-18.2	0.212	0.48	0.18	2	102	10	301	3	0	1.52	74	1014	9
6	2	15	46	12	78.5	0.221	1.204	0.005	805	239	-12.4	0.212	0.48	0.18	1.6	98	10	299.2	3	0	0.51	74	1014	9
6	2	15	46	13	118	0.259	1.537	0.005	1114	303	-13.3	0.212	0.48	0.18	1.9	96	10	300.9	3	0	0.25	72	1013	8
6	2	15	46	14	77.3	0.23	1.413	0.008	1319	254	-14.1	0.212	0.48	0.18	1.7	112	10	300.1	3	0	0	67	1012	9
6	2	15	46	15	77.8	0.267	1.459	0.009	1443	318	-22.2	0.212	0.48	0.18	2.1	112	10	301.8	3	0	0	67	1012	9
6	2	15	46	16	44.5	0.227	1.217	0.009	1461	250	-23.8	0.212	0.48	0.19	1.8	98	10	301.9	3	0	0	67	1012	9
6	2	15	46	17	1.9	0.162	0.425	0.009	1459	151	-203.9	0.212	0.48	0.23	1.5	104	10	298.8	3	0	0.25	77	1012	10
6	2	15	46	18	0.1	0.195	0.16	0.009	1458	198	-6688.7	0.562	0.7	0.4	1.4	84	10	297.8	3	0	0	94	1012	7
6	2	15	46	19	-3.5	0.069	-9	-9	-999	55	8.6	0.562	0.7	1	1	79	10	296.8	3	0	0	97	1013	3
6	2	15	46	20	-4.3	0.076	-9	-9	-999	49	9.4	0.562	0.7	1	1.1	82	10	296.5	3	0	0.25	93	1013	3
6	2	15	46	21	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	64	10	296.4	3	0	0	90	1014	3
6	2	15	46	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	296.2	3	0	0	97	1014	7
6	2	15	46	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	70	10	296.2	3	0	1.02	93	1014	7
6	2	15	46	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	56	10	296	3	0	0	97	1014	7
6	2	16	47	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	295.8	3	0	0	97	1013	7
6	2	16	47	2	-3.1	0.069	-9	-9	-999	42	9.6	0.562	0.7	1	1	66	10	295.5	3	0	0	93	1013	7
6	2	16	47	3	-3.1	0.069	-9	-9	-999	42	9.6	0.562	0.7	1	1	78	10	295.5	3	0	0.25	97	1012	7
6	2	16	47	4	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	103	10	295.8	3	0	0.25	93	1012	3
6	2	16	47	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	295.6	3	0	0	100	1013	3
6	2	16	47	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	295.9	3	0	0	100	1013	3
6	2	16	47	7	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	0.76	1	71	10	298	3	0	0	100	1014	0
6	2	16	47	8	64.4	0.265	0.703	0.005	195	313	-26	0.562	0.7	0.32	1.5	83	10	300	3	0	0	88	1014	0
6	2	16	47	9	80.6	0.221	0.892	0.005	319	240	-12.1	0.212	0.48	0.21	1.6	90	10	301.4	3	0	0	88	1015	0
6	2	16	47	10	96.2	0.291	1.075	0.005	467	361	-23.2	0.212	0.48	0.19	2.3	88	10	301.4	3	0	0	72	1015	7
6	2	16	47	11	111.5	0.286	1.322	0.005	751	351	-18.9	0.212	0.48	0.18	2.2	86	10	300.6	3	0	0	85	1014	7
6	2	16	47	12	143.8	0.321	1.549	0.005	935	418	-20.7	0.212	0.48	0.18	2.5	91	10	302.4	3	0	0	67	1013	6
6	2	16	47	13	136.7	0.31	1.596	0.005	1076	397	-19.7	0.212	0.48	0.18	2.4	98	10	302.9	3	0	0	59	1013	7
6	2	16	47	14	115.9	0.315	1.565	0.005	1196	406	-24.3	0.212	0.48	0.18	2.5	106	10	303	3	0	0	57	1012	8
6	2	16	47	15	65.9	0.264	1.32	0.006	1261	312	-25.1	0.212	0.48	0.18	2.1	104	10	301.8	3	0	0	59	1011	9
6	2	16	47	16	49.1	0.267	1.213	0.007	1312	317	-34.9	0.212	0.48	0.19	2.2	102	10	302.1	3	0	0	59	1010	9
6	2	16	47	17	9.6	0.223	0.705	0.007	1317	243	-104.4	0.212	0.48	0.23	2	93	10	300.4	3	0	0	57	1011	10
6	2	16	47	18	0.1	0.153	0.154	0.007	1311	139	-3260.8	0.562	0.7	0.4	1.1	76	10	298.6	3	0	0	65	1011	3
6	2	16	47	19	-1.8	0.047	-9	-9	-999	34	5	0.212	0.48	1	0.9	92	10	297.5	3	0	0	69	1012	3
6	2	16	47	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	119	10	296.9	3	0	0	87	1013	0
6	2	16	47	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	114	10	296.2	3	0	0	94	1013	3
6	2	16	47	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	122	10	295.9	3	0	0	79	1013	3
6	2	16	47	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	124	10	295.8	3	0	0	82	1013	0
6	2	16	47	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	115	10	295.6	3	0	0	84	1013	3
6	2	17	48	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	295.2	3	0	0	93	1012	3
6	2	17	48	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	96	10	295	3	0	0	90	1012	0
6	2	17	48	3	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	295	3	0	0	93	1012	3
6	2	17	48	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	295	3	0	0	100	1011	3
6	2	17	48	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	294.9	3	0	0	93	1012	3
6	2	17	48	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	51	10	294.8	3	0	0	93	1013	3
6	2	17	48	7	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	0.76	0.8	69	10	298.2	3	0	0	93	1013	0
6	2	17	48	8	51.1	0.173	0.704	0.005	247	165	-9.1	0.212	0.48	0.32	1.2	93	10	300.8	3	0	0	79	1014	0
6	2	17	48	9	76.6	0.239	0.946	0.005	399	269	-16.1	0.212	0.48	0.21	1.8	104	10	302	3	0	0	72	1014	0
6	2	17	48	10	117.5	0.278	1.378	0.005	807	337	-16.5	0.212	0.48	0.19	2.1	99	10	303	3	0	0	74	1014	5

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	17	48	11	129	0.28	1.516	0.005	977	341	-15.4	0.212	0.48	0.18	2.1	98	10	303.1	3	0	0	87	1014	6
6	2	17	48	12	139.5	0.386	1.598	0.005	1057	552	-37.3	0.562	0.7	0.18	2.3	82	10	302.6	3	0	0	79	1013	8
6	2	17	48	13	123.3	0.298	1.571	0.005	1135	377	-19.3	0.212	0.48	0.18	2.3	106	10	302.9	3	0	0	67	1012	8
6	2	17	48	14	125.1	0.298	1.643	0.005	1278	374	-19.1	0.212	0.48	0.18	2.3	109	10	303.9	3	0	0	55	1010	7
6	2	17	48	15	94.9	0.291	1.538	0.005	1384	361	-23.4	0.212	0.48	0.18	2.3	106	10	303.5	3	0	0	55	1010	8
6	2	17	48	16	55.2	0.269	1.303	0.005	1443	322	-31.9	0.212	0.48	0.19	2.2	105	10	302.8	3	0	0	63	1010	9
6	2	17	48	17	2.6	0.184	0.473	0.005	1438	183	-210.9	0.212	0.48	0.23	1.7	100	10	300.5	3	0	0	63	1010	10
6	2	17	48	18	0.1	0.125	0.159	0.005	1432	103	-1770.6	0.212	0.48	0.4	1.2	102	10	298.6	3	0	0	65	1010	3
6	2	17	48	19	-1.8	0.047	-9	-9	-999	26	5	0.212	0.48	1	0.9	92	10	297.8	3	0	0	79	1011	3
6	2	17	48	20	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	297	3	0	0	82	1012	3
6	2	17	48	21	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	76	10	296.4	3	0	0	74	1013	3
6	2	17	48	22	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	77	10	295.9	3	0	0	90	1013	0
6	2	17	48	23	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	295.9	3	0	0	100	1013	3
6	2	17	48	24	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	78	10	295.6	3	0	0	93	1013	3
6	2	18	49	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	61	10	295.1	3	0	0	100	1013	3
6	2	18	49	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	295	3	0	0	97	1012	3
6	2	18	49	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	294.9	3	0	0	93	1012	3
6	2	18	49	4	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	95	10	294.8	3	0	0	93	1012	3
6	2	18	49	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	99	10	294.8	3	0	0	97	1012	0
6	2	18	49	6	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	76	10	295	3	0	0	93	1012	3
6	2	18	49	7	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	0.75	1	65	10	297.5	3	0	0	93	1013	0
6	2	18	49	8	65	0.265	1.162	0.005	873	314	-25.8	0.562	0.7	0.31	1.5	71	10	300.5	3	0	0	82	1014	0
6	2	18	49	9	113.8	0.318	1.483	0.005	1039	413	-25.6	0.562	0.7	0.21	1.8	77	10	301.9	3	0	0	67	1014	0
6	2	18	49	10	137.9	0.243	1.678	0.005	1242	278	-9.5	0.212	0.48	0.19	1.7	87	10	303.4	3	0	0	51	1014	0
6	2	18	49	11	174.1	0.281	1.93	0.008	1496	342	-11.5	0.562	0.7	0.18	1.4	75	10	304.2	3	0	0	51	1014	6
6	2	18	49	12	162.8	0.279	1.916	0.008	1564	338	-12	0.562	0.7	0.18	1.4	9	10	303.6	3	0	0	48	1013	7
6	2	18	49	13	209.9	0.451	2.113	0.007	1627	696	-39.4	0.562	0.7	0.18	2.7	347	10	303.4	3	0	0	59	1012	5
6	2	18	49	14	71.9	-9	-9	-9	1647	-999	-99999	0.475	0.6	0.17	0	0	10	301.6	3	0	0	90	1011	10
6	2	18	49	15	25.3	0.18	1.051	0.007	1653	175	-20.7	0.212	0.48	0.18	1.4	116	10	300.4	3	0	0	74	1010	10
6	2	18	49	16	24.5	0.255	1.041	0.007	1661	296	-61.2	0.562	0.7	0.19	1.6	84	10	300.9	3	0	0	72	1010	10
6	2	18	49	17	0.9	0.149	0.348	0.007	1660	137	-329.7	0.212	0.48	0.23	1.4	96	10	299.8	3	0	0	57	1011	10
6	2	18	49	18	0.1	0.125	0.167	0.007	1658	102	-1771.7	0.212	0.48	0.4	1.2	108	10	298	3	0	0	65	1011	3
6	2	18	49	19	-2.9	0.062	-9	-9	-999	37	7.5	0.212	0.48	1	1.2	87	10	296.9	3	0	0	74	1012	7
6	2	18	49	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	82	10	295.9	3	0	0	84	1012	3
6	2	18	49	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	78	10	295.4	3	0	0	90	1013	3
6	2	18	49	22	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	83	10	295.2	3	0	0	93	1013	3
6	2	18	49	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	74	10	294.9	3	0	0	90	1013	0
6	2	18	49	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	294.8	3	0	0	93	1013	3
6	2	19	50	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	101	10	294.1	3	0	0	93	1012	3
6	2	19	50	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	118	10	293.9	3	0	0	97	1012	0
6	2	19	50	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	103	10	293.9	3	0	0	93	1012	3
6	2	19	50	4	-1.9	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	112	10	293.9	3	0	0	100	1012	3
6	2	19	50	5	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	109	10	293.9	3	0	0	97	1012	7
6	2	19	50	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	294.2	3	0	0	93	1013	7
6	2	19	50	7	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	0.75	0.8	74	10	298.4	3	0	0	93	1013	0
6	2	19	50	8	70.1	0.19	0.77	0.007	235	190	-8.8	0.562	0.7	0.31	0.9	50	10	300.9	3	0	0	90	1014	0
6	2	19	50	9	98.1	0.184	0.997	0.007	365	181	-5.7	0.562	0.7	0.21	0.8	26	10	301.9	3	0	0	79	1015	4
6	2	19	50	10	92.4	0.223	1.076	0.006	488	242	-10.8	0.562	0.7	0.19	1.1	358	10	301.4	3	0	0	63	1015	8
6	2	19	50	11	152	0.315	1.425	0.005	690	406	-18.5	0.562	0.7	0.18	1.7	343	10	301.9	3	0	0	59	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	19	50	12	179	0.395	1.62	0.005	858	571	-31.1	0.562	0.7	0.18	2.3	345	10	302.2	3	0	0	51	1013	7
6	2	19	50	13	179.5	0.395	1.723	0.005	1031	572	-31.1	0.562	0.7	0.18	2.3	341	10	302.9	3	0	0	55	1012	7
6	2	19	50	14	129.8	0.397	1.606	0.005	1153	575	-43.4	0.562	0.7	0.18	2.4	346	10	302.2	3	0	0	47	1012	8
6	2	19	50	15	125.6	0.396	1.642	0.005	1273	573	-44.5	0.562	0.7	0.18	2.4	345	10	302.4	3	0	0	51	1011	8
6	2	19	50	16	24.2	0.23	0.953	0.005	1289	272	-45.4	0.562	0.7	0.19	1.4	22	10	300.4	3	0	0	85	1011	10
6	2	19	50	17	3.2	0.195	0.483	0.005	1285	198	-210.7	0.212	0.48	0.23	1.8	132	10	298.4	3	0	0	82	1012	10
6	2	19	50	18	0.1	0.105	0.153	0.005	1284	81	-1037.4	0.212	0.48	0.4	1	132	10	297.9	3	0	0	90	1012	3
6	2	19	50	19	-2.3	0.052	-9	-9	-999	28	5.6	0.212	0.48	1	1	102	10	297.2	3	0	0	97	1012	3
6	2	19	50	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	89	10	296.9	3	0	0	93	1013	3
6	2	19	50	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	95	10	296.2	3	0	0	97	1013	3
6	2	19	50	22	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	63	10	295.9	3	0	0	93	1013	3
6	2	19	50	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	80	10	295.4	3	0	0	97	1013	0
6	2	19	50	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	91	10	295.1	3	0	0	100	1013	3
6	2	20	51	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	294.9	3	0	0	100	1012	3
6	2	20	51	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	94	10	294.5	3	0	0	93	1012	3
6	2	20	51	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	78	10	294.4	3	0	0	93	1012	3
6	2	20	51	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	110	10	294.2	3	0	0	100	1012	3
6	2	20	51	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	294.1	3	0	0	97	1012	3
6	2	20	51	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	294.8	3	0	0	100	1013	3
6	2	20	51	7	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	0.74	0.7	113	10	297.9	3	0	0	93	1014	0
6	2	20	51	8	55.8	0.211	0.658	0.009	185	223	-15.2	0.562	0.7	0.31	1.1	70	10	300.4	3	0	0	90	1014	0
6	2	20	51	9	99.8	0.255	0.924	0.008	285	296	-15	0.212	0.48	0.21	1.9	88	10	302.2	3	0	0	74	1014	0
6	2	20	51	10	118.6	0.259	1.1	0.006	406	303	-13.3	0.212	0.48	0.19	1.9	96	10	303.1	3	0	0	74	1014	0
6	2	20	51	11	148.7	0.275	1.318	0.005	557	331	-12.6	0.212	0.48	0.18	2	91	10	304.1	3	0	0	67	1014	4
6	2	20	51	12	105.8	0.284	1.282	0.005	721	349	-19.6	0.212	0.48	0.18	2.2	89	10	303.8	3	0	0	55	1013	8
6	2	20	51	13	139	0.31	1.541	0.005	951	398	-19.4	0.212	0.48	0.18	2.4	103	10	304.4	3	0	0	59	1012	7
6	2	20	51	14	75.6	0.276	1.308	0.005	1069	334	-25.1	0.212	0.48	0.18	2.2	97	10	302.9	3	0	0	61	1012	9
6	2	20	51	15	56	0.27	1.216	0.005	1159	322	-31.5	0.212	0.48	0.18	2.2	101	10	302.8	3	0	0	67	1011	10
6	2	20	51	16	42.1	0.264	1.126	0.005	1225	312	-39.3	0.212	0.48	0.19	2.2	97	10	302.5	3	0	0	63	1011	10
6	2	20	51	17	1.7	0.267	0.383	0.005	1219	318	-1040.9	0.562	0.7	0.23	1.9	84	10	300.6	3	0	0	63	1012	10
6	2	20	51	18	0.1	0.181	0.15	0.005	1213	180	-5361.4	0.562	0.7	0.39	1.3	80	10	299.4	3	0	0	69	1012	7
6	2	20	51	19	-5.9	0.09	-9	-9	-999	66	11.2	0.562	0.7	1	1.3	80	10	298.4	3	0	0	74	1013	3
6	2	20	51	20	-5.3	0.09	-9	-9	-999	62	12.6	0.562	0.7	1	1.3	80	10	298.2	3	0	0	79	1013	7
6	2	20	51	21	-6.1	0.097	-9	-9	-999	70	13.6	0.562	0.7	1	1.4	74	10	298.1	3	0	0	85	1014	7
6	2	20	51	22	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	80	10	297.9	3	0	0	90	1014	3
6	2	20	51	23	-4.4	0.076	-9	-9	-999	49	9.2	0.562	0.7	1	1.1	72	10	297.2	3	0	0	82	1014	0
6	2	20	51	24	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	86	10	296.8	3	0	0	79	1013	7
6	2	21	52	1	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	72	10	296.6	3	0	0	97	1012	7
6	2	21	52	2	-5.3	0.09	-9	-9	-999	62	12.6	0.562	0.7	1	1.3	62	10	296.5	3	0	0	97	1012	7
6	2	21	52	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	67	10	296.4	3	0	0	97	1012	7
6	2	21	52	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	79	10	296.2	3	0	0	97	1012	7
6	2	21	52	5	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	87	10	296.4	3	0	0	97	1012	7
6	2	21	52	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	118	10	296.6	3	0	0	100	1013	7
6	2	21	52	7	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	0.74	0.8	113	10	297	3	0	0	94	1013	0
6	2	21	52	8	19.5	0.108	0.407	0.008	124	82	-5.9	0.212	0.48	0.31	0.7	95	10	298.8	3	0	0	91	1014	8
6	2	21	52	9	29.6	0.192	0.514	0.007	166	193	-21.5	0.212	0.48	0.21	1.5	105	10	299.4	3	0	0.51	82	1015	10
6	2	21	52	10	53.7	0.183	0.709	0.006	240	181	-10.4	0.212	0.48	0.19	1.3	93	10	298.4	3	0	2.29	77	1015	9
6	2	21	52	11	103.4	0.265	1.032	0.005	385	313	-16.2	0.562	0.7	0.18	1.4	70	10	299.4	3	0	0.25	87	1014	9
6	2	21	52	12	47.2	0.228	0.838	0.005	450	251	-22.8	0.212	0.48	0.18	1.8	97	10	299	3	0	4.57	94	1014	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	21	52	13	12	0.188	0.536	0.005	464	187	-49.9	0.212	0.48	0.18	1.6	109	10	296.8	3	0	6.86	94	1013	10
6	2	21	52	14	34.7	0.194	0.791	0.005	514	197	-19.1	0.212	0.48	0.18	1.5	93	10	297.6	3	0	1.27	100	1012	10
6	2	21	52	15	50.2	0.202	0.955	0.005	626	208	-14.7	0.212	0.48	0.18	1.5	97	10	299.6	3	0	0	94	1012	10
6	2	21	52	16	18.7	0.166	0.714	0.005	700	155	-21.9	0.212	0.48	0.19	1.3	92	10	299.6	3	0	0	94	1011	10
6	2	21	52	17	2.5	0.189	0.366	0.005	706	189	-245.2	0.562	0.7	0.23	1.3	70	10	298.9	3	0	0	94	1012	10
6	2	21	52	18	0.1	0.126	0.125	0.005	702	104	-1803.4	0.562	0.7	0.39	0.9	73	10	298	3	0	0	88	1012	7
6	2	21	52	19	-3.1	0.069	-9	-9	-999	43	9.7	0.562	0.7	1	1	71	10	297.6	3	0	0	94	1012	7
6	2	21	52	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	74	10	297.4	3	0	0.25	94	1013	7
6	2	21	52	21	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	96	10	297.2	3	0	1.27	94	1013	7
6	2	21	52	22	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	96	10	296.9	3	0	0.25	94	1013	7
6	2	21	52	23	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	86	10	297.1	3	0	0	90	1013	7
6	2	21	52	24	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	65	10	297.1	3	0	0	94	1013	7
6	2	22	53	1	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	63	10	297	3	0	0	85	1012	7
6	2	22	53	2	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	64	10	296.9	3	0	0	87	1012	7
6	2	22	53	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	296.9	3	0	0	94	1012	7
6	2	22	53	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	52	10	296.4	3	0	0	90	1012	7
6	2	22	53	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	54	10	296.4	3	0	0	87	1012	7
6	2	22	53	6	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	83	10	296.8	3	0	0	90	1013	3
6	2	22	53	7	-5.2	0.083	-9	-9	-999	55	10.1	0.562	0.7	0.73	1.2	73	10	298.4	3	0	0	90	1014	0
6	2	22	53	8	61.2	0.313	0.783	0.005	283	402	-45.2	0.562	0.7	0.31	1.9	70	10	300.9	3	0	0.25	77	1014	0
6	2	22	53	9	76.7	0.306	1.04	0.005	532	389	-33.8	0.562	0.7	0.21	1.8	63	10	301.2	3	0	0	74	1015	8
6	2	22	53	10	77.1	0.331	1.184	0.005	780	438	-42.6	0.562	0.7	0.19	2	84	10	300.6	3	0	1.02	72	1015	9
6	2	22	53	11	98.1	0.264	1.376	0.005	963	313	-16.9	0.212	0.48	0.18	2	87	10	300.4	3	0	0	69	1015	8
6	2	22	53	12	169.4	0.406	1.814	0.005	1276	594	-35.6	0.562	0.7	0.18	2.4	76	10	301.9	3	0	0	67	1013	7
6	2	22	53	13	114.3	0.305	1.622	0.005	1350	393	-22.4	0.212	0.48	0.18	2.4	91	10	302.8	3	0	0	67	1012	8
6	2	22	53	14	122	0.307	1.69	0.005	1429	391	-21.4	0.212	0.48	0.18	2.4	95	10	303.2	3	0	0	67	1012	8
6	2	22	53	15	93.1	0.319	1.565	0.005	1488	414	-31.4	0.212	0.48	0.18	2.6	90	10	302.8	3	0	0	79	1011	8
6	2	22	53	16	49.2	0.276	1.274	0.005	1518	335	-38.6	0.212	0.48	0.19	2.3	87	10	302.2	3	0	0	74	1011	9
6	2	22	53	17	8.2	0.231	0.703	0.005	1520	256	-135.4	0.212	0.48	0.23	2.1	90	10	300.4	3	0	0	63	1012	10
6	2	22	53	18	0.1	0.181	0.162	0.005	1517	178	-5361.4	0.562	0.7	0.39	1.3	84	10	298.8	3	0	0	69	1012	3
6	2	22	53	19	-3.5	0.069	-9	-9	-999	50	8.6	0.562	0.7	1	1	81	10	297.8	3	0	0	79	1013	3
6	2	22	53	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	71	10	297	3	0	0	79	1013	3
6	2	22	53	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	53	10	296.6	3	0	0	79	1014	3
6	2	22	53	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	68	10	296.1	3	0	0	79	1014	3
6	2	22	53	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	296.4	3	0	0	90	1014	3
6	2	22	53	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	47	10	296	3	0	0	79	1013	3
6	2	23	54	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	48	10	295.2	3	0	0	79	1013	3
6	2	23	54	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	294.9	3	0	0	76	1012	3
6	2	23	54	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	294.5	3	0	0	74	1012	3
6	2	23	54	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	132	10	294	3	0	0	79	1012	3
6	2	23	54	5	-0.6	0.026	-9	-9	-999	10	2.7	0.212	0.48	1	0.5	117	10	293.8	3	0	0	82	1012	0
6	2	23	54	6	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	114	10	293.9	3	0	0	73	1013	3
6	2	23	54	7	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	0.73	0.8	118	10	297.1	3	0	0	81	1013	0
6	2	23	54	8	67.5	0.24	1.144	0.005	802	271	-18.6	0.562	0.7	0.31	1.3	69	10	300.4	3	0	0	67	1014	0
6	2	23	54	9	119.8	0.369	1.461	0.005	944	515	-37.9	0.562	0.7	0.21	2.2	80	10	302.1	3	0	0	59	1015	0
6	2	23	54	10	163.9	0.442	1.726	0.005	1138	675	-47.6	0.562	0.7	0.18	2.7	82	10	302.9	3	0	0	55	1015	0
6	2	23	54	11	142.5	0.321	1.726	0.005	1307	426	-20.9	0.212	0.48	0.18	2.5	87	10	303.2	3	0	0	51	1014	6
6	2	23	54	12	179.8	0.408	1.962	0.005	1521	599	-34	0.562	0.7	0.18	2.4	80	10	303.5	3	0	0	51	1013	7
6	2	23	54	13	143.1	0.311	1.852	0.005	1606	404	-19	0.212	0.48	0.18	2.4	93	10	303.8	3	0	0	48	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	23	54	14	120.5	0.316	1.775	0.006	1678	408	-23.6	0.212	0.48	0.18	2.5	107	10	303.2	3	0	0	50	1011	8
6	2	23	54	15	96.3	0.301	1.666	0.012	1735	379	-25.5	0.212	0.48	0.18	2.4	108	10	303.1	3	0	0	59	1011	8
6	2	23	54	16	47.7	0.266	1.325	0.014	1761	316	-35.7	0.212	0.48	0.19	2.2	95	10	302.1	3	0	0	55	1011	9
6	2	23	54	17	15.3	0.229	0.908	0.015	1767	252	-70.3	0.212	0.48	0.23	2	91	10	300.6	3	0	0	59	1012	10
6	2	23	54	18	0.1	0.195	0.17	0.014	1762	198	-6686.5	0.562	0.7	0.39	1.4	83	10	298.5	3	0	0	60	1012	3
6	2	23	54	19	-3.5	0.069	-9	-9	-999	55	8.6	0.562	0.7	1	1	65	10	297.5	3	0	0	74	1012	3
6	2	23	54	20	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	81	10	296.9	3	0	0	71	1013	0
6	2	23	54	21	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	111	10	296.2	3	0	0	84	1013	3
6	2	23	54	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	79	10	296.2	3	0	0	84	1013	3
6	2	23	54	23	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	76	10	296.2	3	0	0	82	1013	7
6	2	23	54	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	58	10	296	3	0	0.25	97	1013	7
6	2	24	55	1	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	47	10	295.8	3	0	0	90	1012	3
6	2	24	55	2	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	48	10	295.5	3	0	0	93	1012	7
6	2	24	55	3	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	74	10	295.5	3	0	0.76	90	1012	3
6	2	24	55	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	74	10	295.2	3	0	0	93	1012	3
6	2	24	55	5	-3.4	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	123	10	295.4	3	0	0.25	97	1012	0
6	2	24	55	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	99	10	295.9	3	0	0	93	1013	3
6	2	24	55	7	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	0.72	1	57	10	296.6	3	0	0	93	1014	0
6	2	24	55	8	31	0.174	0.526	0.005	169	167	-15.3	0.212	0.48	0.31	1.3	86	10	298.5	3	0	0	93	1014	0
6	2	24	55	9	96.2	0.25	1.012	0.005	390	288	-14.8	0.562	0.7	0.21	1.3	77	10	300.9	3	0	0	79	1015	5
6	2	24	55	10	105.4	0.256	1.226	0.005	633	298	-14.4	0.212	0.48	0.19	1.9	93	10	301.9	3	0	0	77	1015	7
6	2	24	55	11	134.1	0.373	1.466	0.005	851	523	-34.9	0.562	0.7	0.18	2.2	77	10	300.1	3	0	0	72	1015	8
6	2	24	55	12	116.8	0.268	1.458	0.005	961	325	-14.9	0.212	0.48	0.18	2	100	10	301.8	3	0	0	82	1014	8
6	2	24	55	13	79.5	0.249	1.316	0.005	1035	286	-17.5	0.212	0.48	0.18	1.9	86	10	301.5	3	0	0	74	1013	9
6	2	24	55	14	79.3	0.268	1.345	0.005	1108	319	-21.9	0.212	0.48	0.18	2.1	100	10	301.1	3	0	0	69	1012	9
6	2	24	55	15	40.2	0.244	1.085	0.005	1145	278	-32.7	0.212	0.48	0.18	2	97	10	300.6	3	0	0	74	1012	10
6	2	24	55	16	21.4	0.196	0.882	0.005	1160	200	-31.8	0.212	0.48	0.19	1.6	97	10	298.9	3	0	0.25	69	1012	10
6	2	24	55	17	6	0.219	0.58	0.005	1165	235	-156.1	0.212	0.48	0.23	2	88	10	298.5	3	0	0	79	1012	10
6	2	24	55	18	0.1	0.181	0.148	0.005	1163	178	-5363.2	0.562	0.7	0.39	1.3	62	10	297.5	3	0	0	90	1012	3
6	2	24	55	19	-3.8	0.076	-9	-9	-999	54	10.6	0.562	0.7	1	1.1	64	10	296.8	3	0	0	85	1013	7
6	2	24	55	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	58	10	296.4	3	0	0	87	1013	7
6	2	24	55	21	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	66	10	296.4	3	0	0	90	1014	3
6	2	24	55	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	58	10	296.4	3	0	0	97	1014	3
6	2	24	55	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	61	10	296.4	3	0	0	90	1014	0
6	2	24	55	24	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	58	10	295.6	3	0	0	84	1013	3
6	2	25	56	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	85	10	295.2	3	0	0	84	1013	3
6	2	25	56	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	74	10	294.9	3	0	0	82	1012	3
6	2	25	56	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	79	10	295.4	3	0	0	79	1012	7
6	2	25	56	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	295.6	3	0	0	97	1013	7
6	2	25	56	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	69	10	295.4	3	0	0	90	1013	7
6	2	25	56	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	295.4	3	0	0	93	1014	3
6	2	25	56	7	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	0.72	1	92	10	298.8	3	0	0	93	1015	0
6	2	25	56	8	66.7	0.302	0.702	0.007	188	382	-37.5	0.562	0.7	0.3	1.8	74	10	301	3	0	0	79	1015	0
6	2	25	56	9	121.8	0.345	1.047	0.006	341	465	-30.4	0.562	0.7	0.21	2	69	10	302.1	3	0	0	59	1016	0
6	2	25	56	10	138.4	0.337	1.255	0.005	517	450	-25	0.562	0.7	0.18	1.9	67	10	303	3	0	0	55	1016	6
6	2	25	56	11	113.1	0.306	1.273	0.005	660	389	-22.8	0.562	0.7	0.18	1.7	68	10	303	3	0	0	61	1015	9
6	2	25	56	12	134.4	0.336	1.473	0.005	861	448	-25.5	0.562	0.7	0.18	1.9	72	10	303.5	3	0	0	59	1014	8
6	2	25	56	13	159.5	0.342	1.718	0.005	1150	460	-22.7	0.562	0.7	0.18	1.9	82	10	304.1	3	0	0	55	1013	8
6	2	25	56	14	127	0.271	1.693	0.007	1382	326	-14.1	0.212	0.48	0.18	2	91	10	304.5	3	0	0	54	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	25	56	15	109.7	0.366	1.69	0.01	1590	510	-40.4	0.562	0.7	0.18	2.2	83	10	303.9	3	0	0	59	1012	9
6	2	25	56	16	51	0.258	1.314	0.01	1606	307	-30.5	0.212	0.48	0.19	2.1	92	10	302.9	3	0	0	59	1012	9
6	2	25	56	17	11.4	0.244	0.798	0.01	1607	277	-115.2	0.212	0.48	0.23	2.2	87	10	301.2	3	0	0	61	1012	10
6	2	25	56	18	0.1	0.237	0.165	0.01	1606	265	-8888	0.562	0.7	0.39	1.7	84	10	299.2	3	0	0	65	1012	3
6	2	25	56	19	-5.9	0.09	-9	-9	-999	80	11.2	0.562	0.7	1	1.3	67	10	298.2	3	0	0	79	1013	3
6	2	25	56	20	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	67	10	297.6	3	0	0	79	1013	3
6	2	25	56	21	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	70	10	297.2	3	0	0	79	1014	3
6	2	25	56	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	81	10	296.9	3	0	0	79	1014	3
6	2	25	56	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	82	10	296.5	3	0	0	79	1013	0
6	2	25	56	24	-7	0.104	-9	-9	-999	77	14.5	0.562	0.7	1	1.5	74	10	297	2	0	0	84	1012	7
6	2	26	57	1	-31.5	0.391	-9	-9	-999	563	171.1	0.562	0.7	1	3.1	51	10	298.1	2	0	-9	79	1011	7
6	2	26	57	2	-43.6	0.541	-9	-9	-999	915	327.6	0.562	0.7	1	4.1	48	10	298.1	2	0	-9	79	1010	7
6	2	26	57	3	-38.6	0.379	-9	-9	-999	556	127	0.562	0.7	1	3.1	60	10	298.1	2	0	-9	79	1010	3
6	2	26	57	4	-38.7	0.379	-9	-9	-999	536	126.4	0.562	0.7	1	3.1	52	10	297	2	0	-9	84	1010	3
6	2	26	57	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	90	1010	3
6	2	26	57	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	90	1011	3
6	2	26	57	7	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.71	0	0	10	295.9	2	0	-9	90	1012	3
6	2	26	57	8	35	0.583	0.578	0.005	199	1025	-512.6	0.562	0.7	0.3	4.1	62	10	299.2	2	0	-9	74	1012	3
6	2	26	57	9	101.9	1.014	1.037	0.006	396	2349	-925.2	0.562	0.7	0.21	7.2	59	10	300.9	2	0	-9	63	1013	3
6	2	26	57	10	156.8	1.374	1.51	0.005	794	3683	-1493.2	0.562	0.7	0.18	9.8	61	10	302	2	0	-9	55	1013	3
6	2	26	57	11	196.3	1.227	1.768	0.009	1018	3177	-849.2	0.562	0.7	0.18	8.7	60	10	302.5	2	0	-9	51	1012	3
6	2	26	57	12	219	1.31	1.973	0.005	1268	3435	-926.6	0.562	0.7	0.18	9.3	50	10	303.1	2	0	-9	51	1012	3
6	2	26	57	13	224.2	1.162	2.113	0.011	1521	2929	-631	0.562	0.7	0.18	8.2	58	10	303.1	2	0	-9	51	1011	3
6	2	26	57	14	213	1.228	2.158	0.01	1704	3122	-783.8	0.562	0.7	0.18	8.7	61	10	303.1	2	0	-9	51	1010	3
6	2	26	57	15	184.5	1.158	2.099	0.011	1811	2885	-759	0.562	0.7	0.18	8.2	56	10	303.1	2	0	-9	51	1010	3
6	2	26	57	16	139.6	1.373	1.921	0.005	1831	3672	-1666.5	0.562	0.7	0.19	9.8	62	10	303.1	2	0	-9	55	1009	3
6	2	26	57	17	75	1.079	1.565	0.01	1841	2711	-1507.4	0.562	0.7	0.23	7.7	57	10	302	2	0	-9	61	1009	0
6	2	26	57	18	11.6	0.643	0.84	0.008	1841	1463	-2071.8	0.562	0.7	0.39	4.6	64	10	300.4	2	0	-9	65	1010	3
6	2	26	57	19	-38.5	0.379	-9	-9	-999	680	127.7	0.562	0.7	1	3.1	63	10	299.2	2	0	-9	74	1010	3
6	2	26	57	20	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.5	2	0	-9	82	1010	0
6	2	26	57	21	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297	2	0	-9	84	1011	3
6	2	26	57	22	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	90	1011	3
6	2	26	57	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.4	2	0	-9	90	1012	0
6	2	26	57	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.4	2	0	-9	93	1012	3
6	2	27	58	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	294.2	2	0	-9	93	1012	3
6	2	27	58	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	294.2	2	0	-9	97	1010	3
6	2	27	58	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	293.1	2	0	-9	100	1010	3
6	2	27	58	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	293.1	2	0	-9	100	1010	3
6	2	27	58	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	293.8	2	0	-9	97	1010	3
6	2	27	58	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	293.9	2	0	-9	98	1011	3
6	2	27	58	7	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.7	0	0	10	294.2	2	0	-9	100	1012	7
6	2	27	58	8	26.9	-9	-9	-9	115	-999	-99999	0.475	0.6	0.3	0	0	10	297	2	0	-9	87	1013	0
6	2	27	58	9	84.9	0.598	1.138	0.005	627	1065	-228.1	0.562	0.7	0.21	4.1	75	10	300.9	2	0	-9	72	1014	7
6	2	27	58	10	157.5	0.743	1.518	0.006	804	1471	-235.7	0.562	0.7	0.18	5.1	69	10	302	2	0	-9	63	1014	3
6	2	27	58	11	197.3	0.686	1.892	0.006	1243	1312	-147.9	0.562	0.7	0.18	4.6	61	10	303.1	2	0	-9	55	1014	3
6	2	27	58	12	219.6	0.753	2.005	0.006	1329	1501	-176	0.562	0.7	0.18	5.1	79	10	303.1	2	0	-9	55	1014	3
6	2	27	58	13	224.7	0.627	2.065	0.006	1418	1160	-99.1	0.562	0.7	0.18	4.1	78	10	303.1	2	0	-9	55	1013	3
6	2	27	58	14	173.6	0.618	1.966	0.007	1584	1118	-122.7	0.562	0.7	0.18	4.1	85	10	304.9	2	0	-9	50	1012	7
6	2	27	58	15	185.6	0.826	2.042	0.007	1660	1723	-273.9	0.562	0.7	0.18	5.7	75	10	304.2	2	0	-9	52	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	2	27	58	16	114.6	0.815	1.756	0.007	1706	1692	-425	0.562	0.7	0.19	5.7	85	10	303.1	2	0	-9	59	1011	7
6	2	27	58	17	67.4	0.874	1.478	0.007	1731	1874	-893.8	0.562	0.7	0.23	6.2	66	10	302	2	0	-9	67	1012	7
6	2	27	58	18	13.4	0.644	0.864	0.007	1733	1246	-1796	0.562	0.7	0.39	4.6	71	10	300.4	2	0	-9	69	1012	7
6	2	27	58	19	-43.5	0.541	-9	-9	-999	930	328.9	0.562	0.7	1	4.1	78	10	299.2	2	0	-9	79	1012	7
6	2	27	58	20	-25.2	0.312	-9	-9	-999	447	108.5	0.562	0.7	1	2.6	79	10	298.1	2	0	-9	82	1013	7
6	2	27	58	21	-31.2	0.29	-9	-9	-999	360	70.9	0.562	0.7	1	2.6	76	10	297	2	0	-9	90	1013	0
6	2	27	58	22	-18.4	0.171	-9	-9	-999	170	24.7	0.562	0.7	1	2.1	65	10	297	2	0	-9	90	1014	0
6	2	27	58	23	-40.3	0.376	-9	-9	-999	530	119.2	0.562	0.7	1	3.1	68	10	297.5	2	0	-9	85	1014	0
6	2	27	58	24	-48.7	0.455	-9	-9	-999	706	175	0.562	0.7	1	3.6	77	10	298.1	2	0	-9	85	1014	0
6	2	28	59	1	-38.8	0.379	-9	-9	-999	540	126.4	0.562	0.7	1	3.1	79	10	297	2	0	-9	90	1013	3
6	2	28	59	2	-40.3	0.376	-9	-9	-999	530	118.9	0.562	0.7	1	3.1	79	10	297	2	0	-9	87	1012	0
6	2	28	59	3	-38.8	0.379	-9	-9	-999	536	126.4	0.562	0.7	1	3.1	66	10	297	2	0	-9	90	1012	3
6	2	28	59	4	-7.9	0.104	-9	-9	-999	191	12.9	0.562	0.7	1	1.5	77	10	297	2	0	-9	90	1011	3
6	2	28	59	5	-48.7	0.455	-9	-9	-999	706	174.2	0.562	0.7	1	3.6	80	10	297	2	0	-9	90	1011	0
6	2	28	59	6	-30.2	0.294	-9	-9	-999	384	76.4	0.562	0.7	1	2.6	79	10	297	2	0	-9	90	1012	3
6	2	28	59	7	1	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.69	0	0	10	297	2	0	-9	90	1013	7
6	2	28	59	8	32.2	0.386	0.562	0.005	199	551	-161	0.562	0.7	0.3	2.6	80	10	298.8	2	0	-9	85	1013	7
6	2	28	59	9	85.1	0.877	0.95	0.005	364	1888	-715.9	0.562	0.7	0.21	6.2	67	10	300.4	2	0	-9	77	1014	7
6	2	28	59	10	158.1	0.887	1.432	0.005	673	1922	-399.6	0.562	0.7	0.18	6.2	56	10	302	2	0	-9	67	1014	3
6	2	28	59	11	194.7	1.025	1.772	0.005	1035	2377	-500	0.562	0.7	0.18	7.2	79	10	303.1	2	0	-9	61	1014	0
6	2	28	59	12	139.9	0.565	1.679	0.005	1227	1230	-116.9	0.212	0.48	0.18	5.1	99	10	303.1	2	0	-9	63	1014	7
6	2	28	59	13	143	0.721	1.779	0.005	1424	1406	-237.1	0.212	0.48	0.18	6.7	100	10	303.1	2	0	-9	63	1013	7
6	2	28	59	14	173.3	0.956	1.988	0.005	1639	2144	-454.8	0.562	0.7	0.18	6.7	75	10	303.8	2	0	-9	59	1012	7
6	2	28	59	15	118.3	0.561	1.795	0.005	1767	1146	-134.9	0.212	0.48	0.18	5.1	92	10	303.1	2	0	-9	59	1011	7
6	2	28	59	16	114.3	1.084	1.804	0.005	1855	2593	-1003.8	0.562	0.7	0.19	7.7	59	10	302	2	0	-9	63	1011	7
6	2	28	59	17	67.2	1.01	1.521	0.005	1889	2350	-1381	0.562	0.7	0.23	7.2	72	10	301.4	2	0	-9	63	1011	7
6	2	28	59	18	13.6	1.072	0.893	0.005	1893	2545	-8191.5	0.562	0.7	0.39	7.7	83	10	300.4	2	0	-9	74	1011	7
6	2	28	59	19	-54.2	0.533	-9	-9	-999	1260	252.3	0.562	0.7	1	4.1	77	10	299.2	2	0	-9	79	1012	3
6	2	28	59	20	-38.6	0.379	-9	-9	-999	620	127.4	0.562	0.7	1	3.1	50	10	298.8	2	0	-9	79	1012	3
6	2	28	59	21	-38.7	0.379	-9	-9	-999	538	127	0.562	0.7	1	3.1	59	10	298.1	2	0	-9	85	1013	3
6	2	28	59	22	-25.2	0.311	-9	-9	-999	402	108	0.562	0.7	1	2.6	75	10	297	2	0	-9	84	1013	7
6	2	28	59	23	-5.2	0.078	-9	-9	-999	137	8.1	0.212	0.48	1	1.5	92	10	297	2	0	-9	84	1013	0
6	2	28	59	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297	2	0	-9	84	1013	3
6	3	1	60	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	84	1013	3
6	3	1	60	2	-18	0.221	-9	-9	-999	239	54.3	0.562	0.7	1	2.1	79	10	295.9	2	0	-9	90	1012	7
6	3	1	60	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297	2	0	-9	90	1012	3
6	3	1	60	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	90	1012	3
6	3	1	60	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.4	2	0	-9	90	1012	0
6	3	1	60	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.4	2	0	-9	93	1012	3
6	3	1	60	7	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.69	0	0	10	295.9	2	0	-9	90	1013	3
6	3	1	60	8	33.6	-9	-9	-9	201	-999	-99999	0.475	0.6	0.29	0	0	10	298.8	2	0	-9	77	1014	3
6	3	1	60	9	86	0.944	0.965	0.005	379	2111	-886.9	0.562	0.7	0.21	6.7	78	10	300.9	2	0	-9	67	1015	7
6	3	1	60	10	129.3	0.95	1.311	0.005	632	2130	-600.6	0.562	0.7	0.18	6.7	64	10	302	2	0	-9	59	1015	7
6	3	1	60	11	160.8	1.021	1.575	0.005	881	2366	-599.5	0.562	0.7	0.18	7.2	74	10	303.1	2	0	-9	53	1015	7
6	3	1	60	12	220.2	0.961	1.961	0.005	1241	2179	-364.9	0.562	0.7	0.18	6.7	67	10	302	2	0	-9	59	1014	3
6	3	1	60	13	226.5	1.095	2.14	0.008	1567	2624	-523.7	0.562	0.7	0.18	7.7	75	10	304.2	2	0	-9	48	1013	3
6	3	1	60	14	214.6	1.027	2.161	0.006	1701	2408	-455.8	0.562	0.7	0.18	7.2	75	10	303.1	2	0	-9	51	1012	3
6	3	1	60	15	185.8	1.159	2.091	0.007	1778	2854	-754.4	0.562	0.7	0.18	8.2	74	10	303.1	2	0	-9	59	1011	3
6	3	1	60	16	140.1	1.086	1.909	0.008	1795	2621	-825.4	0.562	0.7	0.19	7.7	85	10	302	2	0	-9	59	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	1	60	17	80.3	1.08	1.589	0.007	1806	2583	-1413.9	0.562	0.7	0.23	7.7	81	10	301.4	2	0	-9	65	1011	3
6	3	1	60	18	12.1	0.864	0.846	0.006	1806	1914	-4808.2	0.562	0.7	0.38	6.2	75	10	300.4	2	0	-9	65	1012	3
6	3	1	60	19	-38.6	0.379	-9	-9	-999	868	127.7	0.562	0.7	1	3.1	69	10	299.2	2	0	-9	74	1012	3
6	3	1	60	20	-40.3	0.376	-9	-9	-999	545	119.2	0.562	0.7	1	3.1	79	10	297.5	2	0	-9	79	1012	0
6	3	1	60	21	-30.2	0.294	-9	-9	-999	371	76.4	0.562	0.7	1	2.6	69	10	297	2	0	-9	84	1013	3
6	3	1	60	22	-38.8	0.379	-9	-9	-999	536	126.4	0.562	0.7	1	3.1	69	10	297	2	0	-9	84	1013	3
6	3	1	60	23	-31.1	0.29	-9	-9	-999	363	71.1	0.562	0.7	1	2.6	83	10	297.5	2	0	-9	79	1013	0
6	3	1	60	24	-30.2	0.294	-9	-9	-999	367	76.4	0.562	0.7	1	2.6	50	10	297	2	0	-9	84	1013	3
6	3	2	61	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297	2	0	-9	84	1013	3
6	3	2	61	2	-64	0.917	-9	-9	-999	2018	1085.6	0.562	0.7	1	6.7	79	10	296.4	2	0	-9	82	1012	0
6	3	2	61	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	90	1012	3
6	3	2	61	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	90	1012	3
6	3	2	61	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	87	1012	0
6	3	2	61	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	84	1012	3
6	3	2	61	7	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.68	0	0	10	295.9	2	0	-9	90	1013	3
6	3	2	61	8	32.2	0.386	0.542	0.005	179	551	-161.5	0.562	0.7	0.3	2.6	75	10	299.2	2	0	-9	74	1014	0
6	3	2	61	9	104.5	1.151	1.029	0.009	377	2839	-1319.1	0.562	0.7	0.21	8.2	83	10	300.9	2	0	-9	67	1015	3
6	3	2	61	10	160.1	1.156	1.5	0.008	763	2858	-873.3	0.562	0.7	0.18	8.2	77	10	303.1	2	0	-9	55	1015	3
6	3	2	61	11	196.1	1.025	1.74	0.007	974	2423	-497.3	0.562	0.7	0.18	7.2	77	10	303.1	2	0	-9	55	1015	0
6	3	2	61	12	174.7	0.824	1.736	0.005	1084	1781	-289.4	0.212	0.48	0.18	7.7	88	10	304.2	2	0	-9	52	1014	3
6	3	2	61	13	227.1	1.028	1.974	0.007	1227	2389	-432.8	0.562	0.7	0.18	7.2	71	10	304.2	2	0	-9	52	1013	3
6	3	2	61	14	169.2	0.823	1.84	0.005	1331	1774	-297.6	0.212	0.48	0.18	7.7	86	10	303.1	2	0	-9	61	1012	3
6	3	2	61	15	146.5	0.921	1.861	0.008	1590	2026	-480.2	0.212	0.48	0.18	8.7	86	10	303.1	2	0	-9	59	1011	3
6	3	2	61	16	141.1	1.304	1.91	0.005	1784	3412	-1417.9	0.562	0.7	0.19	9.3	68	10	303.1	2	0	-9	59	1011	3
6	3	2	61	17	59.6	0.86	1.453	0.007	1855	2091	-960.8	0.212	0.48	0.23	8.2	90	10	301.4	2	0	-9	63	1011	0
6	3	2	61	18	9.6	0.431	0.792	0.006	1862	977	-750.1	0.212	0.48	0.38	4.1	86	10	300.4	2	0	-9	69	1011	3
6	3	2	61	19	-2.7	0.057	-9	-9	-999	652	6.1	0.212	0.48	1	1.1	110	10	297.9	3	0	0	85	1013	3
6	3	2	61	20	-31.1	0.29	-9	-9	-999	372	71.1	0.562	0.7	1	2.6	78	10	297.5	2	0	0	87	1012	0
6	3	2	61	21	-30.1	0.295	-9	-9	-999	368	76.8	0.562	0.7	1	2.6	85	10	298.1	2	0	-9	85	1013	3
6	3	2	61	22	-10	0.109	-9	-9	-999	117	11.7	0.212	0.48	1	2.1	94	10	297	2	0	-9	90	1013	3
6	3	2	61	23	-30.2	0.294	-9	-9	-999	367	76.4	0.562	0.7	1	2.6	70	10	297	2	0	-9	90	1012	3
6	3	2	61	24	-19	0.186	-9	-9	-999	189	30.4	0.562	0.7	1	2.1	69	10	297	2	0	-9	90	1012	3
6	3	3	62	1	-7.9	0.104	-9	-9	-999	80	12.9	0.562	0.7	1	1.5	69	10	297	2	0	-9	58	1012	3
6	3	3	62	2	-31.1	0.29	-9	-9	-999	360	70.9	0.562	0.7	1	2.6	68	10	297	2	0	-9	87	1011	0
6	3	3	62	3	-30.2	0.294	-9	-9	-999	367	75.9	0.562	0.7	1	2.6	79	10	295.9	2	0	-9	97	1010	3
6	3	3	62	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	97	1010	3
6	3	3	62	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	97	1011	3
6	3	3	62	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.9	2	0	-9	97	1011	3
6	3	3	62	7	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.68	0	0	10	295.9	2	0	-9	97	1012	3
6	3	3	62	8	33.1	0.583	0.673	0.005	332	1023	-539.2	0.562	0.7	0.29	4.1	68	10	299.9	2	0	-9	69	1012	0
6	3	3	62	9	83.2	0.662	1.154	0.007	668	1237	-314.8	0.212	0.48	0.21	6.2	93	10	302	2	0	-9	67	1013	3
6	3	3	62	10	131	1.085	1.463	0.005	864	2599	-881.7	0.562	0.7	0.18	7.7	84	10	303.1	2	0	-9	63	1013	7
6	3	3	62	11	127.6	0.818	1.516	0.005	988	1795	-387.8	0.212	0.48	0.18	7.7	87	10	303.8	2	0	-9	57	1013	7
6	3	3	62	12	142.1	0.721	1.667	0.009	1180	1430	-238.5	0.212	0.48	0.18	6.7	125	10	305.4	2	0	0	52	1013	7
6	3	3	62	13	110.6	0.323	1.606	0.009	1356	621	-27.6	0.212	0.48	0.18	2.6	116	10	304.1	3	0	0	59	1013	8
6	3	3	62	14	116.3	0.325	1.656	0.009	1413	430	-26.6	0.212	0.48	0.18	2.6	118	10	303.9	3	0	0	56	1013	8
6	3	3	62	15	78.8	0.296	1.468	0.009	1451	371	-29.7	0.212	0.48	0.18	2.4	114	10	303.6	3	0	0	59	1012	9
6	3	3	62	16	42.1	0.292	1.197	0.009	1470	362	-53.2	0.212	0.48	0.19	2.5	119	10	302.5	3	0	0	67	1012	10
6	3	3	62	17	12.6	0.255	0.802	0.009	1473	296	-118.4	0.212	0.48	0.23	2.3	117	10	300.8	3	0	0	65	1012	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	3	62	18	0.1	0.197	0.16	0.009	1471	203	-6952.9	0.212	0.48	0.38	1.9	115	10	299.1	3	0	0	77	1012	3
6	3	3	62	19	-4.4	0.073	-9	-9	-999	57	7.8	0.212	0.48	1	1.4	104	10	298.5	3	0	0	82	1013	3
6	3	3	62	20	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	95	10	298.5	3	0	0	82	1014	3
6	3	3	62	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	91	10	298	3	0	0	88	1014	3
6	3	3	62	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	107	10	297.8	3	0	0	88	1015	3
6	3	3	62	23	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	112	10	297.5	3	0	0	90	1014	0
6	3	3	62	24	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.1	114	10	297.6	3	0	0	92	1014	99
6	3	4	63	1	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	109	10	297.5	3	0	0	94	1014	3
6	3	4	63	2	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	112	10	297.5	3	0	0	94	1013	3
6	3	4	63	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	108	10	297.4	3	0	0	94	1013	3
6	3	4	63	4	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	112	10	297	3	0	0	94	1014	3
6	3	4	63	5	-3.4	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	114	10	297.4	3	0	0	94	1014	0
6	3	4	63	6	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	113	10	297.5	3	0	0	90	1014	3
6	3	4	63	7	-5.1	0.078	-9	-9	-999	50	8.3	0.212	0.48	0.67	1.5	120	10	300	3	0	0	94	1015	0
6	3	4	63	8	56.4	0.279	-9	-9	-999	339	-34.9	0.212	0.48	0.29	2.3	127	10	301.6	3	0	0	77	1016	0
6	3	4	63	9	100.8	0.321	-9	-9	-999	418	-29.7	0.212	0.48	0.21	2.6	127	10	302.8	3	0	0	74	1016	0
6	3	4	63	10	131.2	0.328	-9	-9	-999	431	-24.3	0.212	0.48	0.18	2.6	137	10	304	3	0	0	63	1016	0
6	3	4	63	11	122.3	0.326	-9	-9	-999	427	-25.6	0.212	0.48	0.18	2.6	130	10	304.2	3	0	0	61	1016	7
6	3	4	63	12	116.6	0.325	-9	-9	-999	426	-26.6	0.212	0.48	0.18	2.6	132	10	304.2	3	0	0	59	1015	8
6	3	4	63	13	137.4	0.367	-9	-9	-999	510	-32.4	0.212	0.48	0.18	3	129	10	304.2	3	0	0	59	1014	7
6	3	4	63	14	98.3	0.348	-9	-9	-999	473	-38.8	0.212	0.48	0.18	2.9	131	10	303.4	3	0	0	54	1014	9
6	3	4	63	15	74.1	0.304	-9	-9	-999	386	-34.2	0.212	0.48	0.18	2.5	132	10	303.2	3	0	0	52	1013	9
6	3	4	63	16	48.2	0.285	-9	-9	-999	350	-43.4	0.212	0.48	0.19	2.4	129	10	303.1	3	0	0	59	1013	9
6	3	4	63	17	13.1	0.236	-9	-9	-999	265	-91.1	0.212	0.48	0.23	2.1	121	10	301.8	3	0	0	61	1014	10
6	3	4	63	18	0.1	0.166	-9	-9	-999	157	-4171.1	0.212	0.48	0.38	1.6	113	10	299.5	3	0	0	67	1014	3
6	3	4	63	19	-3.8	0.067	-9	-9	-999	46	7.2	0.212	0.48	1	1.3	106	10	298.4	3	0	0	79	1014	3
6	3	4	63	20	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	109	10	298	3	0	0	82	1014	7
6	3	4	63	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	103	10	297.8	3	0	0	85	1015	3
6	3	4	63	22	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	102	10	297.4	3	0	0	85	1015	3
6	3	4	63	23	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	111	10	297.1	3	0	0	88	1015	0
6	3	4	63	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	113	10	297.1	3	0	0	90	1015	3
6	3	5	64	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	296.9	3	0	0	97	1014	3
6	3	5	64	2	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	109	10	296.8	3	0	0	93	1014	0
6	3	5	64	3	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	116	10	296.9	3	0	0	97	1014	3
6	3	5	64	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	70	10	296.4	3	0	0	90	1014	3
6	3	5	64	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	74	10	295.8	3	0	0	87	1014	0
6	3	5	64	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	102	10	296.4	3	0	0	97	1015	3
6	3	5	64	7	-5.8	0.083	-9	-9	-999	55	8.9	0.212	0.48	0.67	1.6	119	10	299.8	3	0	0	97	1015	0
6	3	5	64	8	52.6	0.259	-9	-9	-999	303	-29.9	0.212	0.48	0.29	2.1	126	10	301.5	3	0	0	88	1016	0
6	3	5	64	9	83.5	0.259	-9	-9	-999	304	-19	0.212	0.48	0.2	2	127	10	302.5	3	0	0	78	1017	0
6	3	5	64	10	125.6	0.27	-9	-9	-999	323	-14.2	0.212	0.48	0.18	2	129	10	303.9	3	0	0	68	1017	4
6	3	5	64	11	118	0.278	-9	-9	-999	337	-16.5	0.212	0.48	0.18	2.1	124	10	304.4	3	0	0	59	1016	8
6	3	5	64	12	127.2	0.289	-9	-9	-999	357	-17.2	0.212	0.48	0.18	2.2	132	10	304.6	3	0	0	56	1015	8
6	3	5	64	13	125.9	0.289	-9	-9	-999	357	-17.3	0.212	0.48	0.18	2.2	116	10	304.9	3	0	0	59	1014	8
6	3	5	64	14	58.5	0.261	-9	-9	-999	307	-27.6	0.212	0.48	0.18	2.1	125	10	304.2	3	0	0	57	1014	10
6	3	5	64	15	64.1	0.273	-9	-9	-999	327	-28.6	0.212	0.48	0.18	2.2	122	10	303.9	3	0	0	55	1013	9
6	3	5	64	16	39.5	0.263	-9	-9	-999	309	-41.4	0.212	0.48	0.19	2.2	119	10	303.1	3	0	0	63	1013	10
6	3	5	64	17	10.2	0.224	-9	-9	-999	244	-99.1	0.212	0.48	0.23	2	115	10	301.6	3	0	0	61	1014	10
6	3	5	64	18	0.1	0.146	-9	-9	-999	130	-2803.9	0.212	0.48	0.38	1.4	106	10	299.9	3	0	0	72	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	5	64	19	-3.3	0.062	-9	-9	-999	39	6.7	0.212	0.48	1	1.2	94	10	298.8	3	0	0	79	1014	3
6	3	5	64	20	-3.4	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	98	10	298.2	3	0	0	85	1015	0
6	3	5	64	21	-5.1	0.078	-9	-9	-999	50	8.3	0.212	0.48	1	1.5	100	10	298	3	0	0	85	1015	3
6	3	5	64	22	-4.5	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	99	10	297.9	3	0	0	85	1015	3
6	3	5	64	23	-3.9	0.067	-9	-9	-999	40	7.1	0.212	0.48	1	1.3	106	10	297.8	3	0	0	85	1015	0
6	3	5	64	24	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	106	10	297.4	3	0	0	85	1015	3
6	3	6	65	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	297.4	3	0	0	90	1015	7
6	3	6	65	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	93	10	297	3	0	0	87	1014	0
6	3	6	65	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	60	10	296.4	3	0	0	90	1014	3
6	3	6	65	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	93	10	296.4	3	0	0	97	1014	7
6	3	6	65	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	88	10	296.4	3	0	0	93	1015	7
6	3	6	65	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	110	10	296.6	3	0	0	97	1015	7
6	3	6	65	7	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	0.66	1.1	102	10	299.5	3	0	0	90	1016	0
6	3	6	65	8	46.4	0.209	0.701	0.005	269	220	-17.9	0.212	0.48	0.29	1.6	96	10	301.8	3	0	0	85	1017	0
6	3	6	65	9	85.4	0.251	1.092	0.005	553	289	-16.8	0.212	0.48	0.2	1.9	108	10	302.5	3	0	0	74	1017	4
6	3	6	65	10	127.1	0.27	1.442	0.005	856	323	-14.1	0.212	0.48	0.18	2	105	10	304	3	0	0	63	1017	4
6	3	6	65	11	152.3	0.285	1.593	0.005	965	350	-13.8	0.212	0.48	0.18	2.1	99	10	304.9	3	0	0	59	1017	5
6	3	6	65	12	113.7	0.267	1.485	0.005	1045	318	-15.2	0.212	0.48	0.18	2	102	10	304.4	3	0	0	59	1016	8
6	3	6	65	13	142	0.301	1.666	0.005	1180	381	-17.5	0.212	0.48	0.18	2.3	95	10	304.4	3	0	0	55	1015	7
6	3	6	65	14	124.1	0.298	1.713	0.006	1467	374	-19.2	0.212	0.48	0.18	2.3	99	10	304.4	3	0	0	59	1014	8
6	3	6	65	15	77.3	0.286	1.489	0.007	1544	352	-27.4	0.212	0.48	0.18	2.3	95	10	303.6	3	0	0	63	1013	9
6	3	6	65	16	37.6	0.234	1.177	0.007	1564	261	-30.6	0.212	0.48	0.19	1.9	92	10	302.4	3	0	0	67	1012	10
6	3	6	65	17	12.8	0.226	0.823	0.007	1569	248	-81.7	0.212	0.48	0.23	2	96	10	301.1	3	0	0	65	1012	10
6	3	6	65	18	0.1	0.156	0.163	0.007	1567	143	-3435.3	0.212	0.48	0.38	1.5	90	10	299.8	3	0	0	69	1012	7
6	3	6	65	19	-3.4	0.067	-9	-9	-999	44	8.1	0.212	0.48	1	1.3	113	10	298.6	3	0	0	79	1012	7
6	3	6	65	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	101	10	298	3	0	0	85	1012	7
6	3	6	65	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	52	10	297.6	3	0	0	85	1012	7
6	3	6	65	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	41	10	296.9	3	0	0	85	1013	7
6	3	6	65	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	29	10	296.5	3	0	0	87	1012	0
6	3	6	65	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	21	10	296.2	3	0	0	90	1012	7
6	3	7	66	1	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	32	10	296.1	3	0	0	90	1011	7
6	3	7	66	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	71	10	295.9	3	0	0	90	1011	7
6	3	7	66	3	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	296.4	3	0	0	97	1011	7
6	3	7	66	4	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	78	10	296.2	3	0	0	97	1012	7
6	3	7	66	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	296	3	0	0	93	1012	7
6	3	7	66	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	78	10	296.2	3	0	0	90	1013	7
6	3	7	66	7	-5	0.083	-9	-9	-999	55	10.4	0.562	0.7	0.66	1.2	83	10	298.8	3	0	0	97	1013	0
6	3	7	66	8	52.8	0.24	0.657	0.005	194	270	-23.7	0.212	0.48	0.29	1.9	93	10	301.1	3	0	0	79	1014	0
6	3	7	66	9	96.7	0.254	0.955	0.005	325	294	-15.3	0.212	0.48	0.2	1.9	102	10	302.9	3	0	0	72	1014	0
6	3	7	66	10	121.2	0.297	1.253	0.005	587	373	-19.6	0.212	0.48	0.18	2.3	108	10	303.6	3	0	0	70	1014	6
6	3	7	66	11	135.7	0.31	1.429	0.005	779	396	-19.8	0.212	0.48	0.18	2.4	104	10	304.2	3	0	0	63	1014	7
6	3	7	66	12	140.6	0.32	1.504	0.005	875	417	-21.1	0.212	0.48	0.18	2.5	104	10	304.6	3	0	0	55	1013	7
6	3	7	66	13	140.7	0.32	1.603	0.005	1060	417	-21.1	0.212	0.48	0.18	2.5	106	10	304.8	3	0	0	55	1012	7
6	3	7	66	14	127.2	0.317	1.702	0.005	1400	411	-22.7	0.212	0.48	0.18	2.5	109	10	304.6	3	0	0	57	1011	8
6	3	7	66	15	80.3	0.297	1.488	0.005	1479	372	-29.3	0.212	0.48	0.18	2.4	113	10	303.8	3	0	0	59	1010	9
6	3	7	66	16	46.5	0.275	1.252	0.005	1522	332	-40.4	0.212	0.48	0.19	2.3	106	10	302.5	3	0	0	63	1010	9
6	3	7	66	17	10	0.224	0.75	0.005	1528	244	-101.1	0.212	0.48	0.23	2	103	10	301	3	0	0	65	1010	10
6	3	7	66	18	0.1	0.156	0.162	0.005	1523	143	-3430.8	0.212	0.48	0.38	1.5	106	10	299.6	3	0	0	74	1010	7
6	3	7	66	19	-3.4	0.067	-9	-9	-999	44	8.1	0.212	0.48	1	1.3	102	10	298.9	3	0	0	79	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	7	66	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	298.4	3	0	0	82	1011	7
6	3	7	66	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	82	10	297.9	3	0	0	85	1012	7
6	3	7	66	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	75	10	297.4	3	0	0	86	1012	7
6	3	7	66	23	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	82	10	297.2	3	0	0	87	1012	7
6	3	7	66	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	72	10	297	3	0	0	90	1012	7
6	3	8	67	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	297	3	0	0	90	1012	7
6	3	8	67	2	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	102	10	296.8	3	0	0	87	1011	7
6	3	8	67	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	297.1	3	0	0	97	1011	7
6	3	8	67	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	296.8	3	0	0	90	1011	7
6	3	8	67	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	296.5	3	0	0	87	1012	7
6	3	8	67	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	72	10	296.5	3	0	0	90	1012	7
6	3	8	67	7	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	0.65	1	99	10	297.4	3	0	0	90	1013	0
6	3	8	67	8	31.1	0.164	0.55	0.005	193	153	-12.9	0.212	0.48	0.29	1.2	110	10	300.1	3	0	0	85	1013	7
6	3	8	67	9	75.4	0.257	0.95	0.005	411	300	-20.4	0.212	0.48	0.2	2	112	10	302	3	0	0	77	1014	6
6	3	8	67	10	112.1	0.286	1.438	0.005	961	351	-18.8	0.212	0.48	0.18	2.2	112	10	303.1	3	0	0	70	1014	7
6	3	8	67	11	156.5	0.295	1.713	0.006	1161	369	-14.9	0.212	0.48	0.18	2.2	118	10	304.4	3	0	0	59	1013	5
6	3	8	67	12	148.1	0.294	1.743	0.006	1293	366	-15.4	0.212	0.48	0.18	2.2	119	10	304.9	3	0	0	59	1012	7
6	3	8	67	13	136.5	0.282	1.721	0.005	1350	344	-14.8	0.212	0.48	0.18	2.1	121	10	305.1	3	0	0	59	1011	8
6	3	8	67	14	97.4	0.273	1.55	0.005	1381	328	-18.8	0.212	0.48	0.18	2.1	117	10	304.5	3	0	0	55	1010	9
6	3	8	67	15	92.3	0.3	1.535	0.005	1415	378	-26.4	0.212	0.48	0.18	2.4	120	10	303.9	3	0	0	59	1010	8
6	3	8	67	16	43.7	0.246	1.204	0.005	1441	281	-30.7	0.212	0.48	0.19	2	106	10	302.9	3	0	0	59	1010	9
6	3	8	67	17	9.9	0.195	0.735	0.005	1444	198	-67.3	0.212	0.48	0.23	1.7	111	10	300.9	3	0	0	63	1010	10
6	3	8	67	18	0.1	0.125	0.159	0.005	1441	103	-1770.6	0.212	0.48	0.38	1.2	106	10	299.5	3	0	0	65	1010	7
6	3	8	67	19	-1.6	0.047	-9	-9	-999	26	5.6	0.212	0.48	1	0.9	90	10	298.6	3	0	0	74	1010	7
6	3	8	67	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	82	10	298	3	0	0	79	1012	7
6	3	8	67	21	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	83	10	297.8	3	0	0	85	1012	3
6	3	8	67	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	106	10	297.1	3	0	0	85	1012	3
6	3	8	67	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	296.9	3	0	0	90	1012	3
6	3	8	67	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	71	10	296.5	3	0	0	97	1012	7
6	3	9	68	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	296.4	3	0	0	97	1011	7
6	3	9	68	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	296	3	0	0	90	1010	7
6	3	9	68	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	71	10	296	3	0	0	100	1010	7
6	3	9	68	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	295.9	3	0	0	97	1010	7
6	3	9	68	5	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	99	10	295.9	3	0	0	97	1011	7
6	3	9	68	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	76	10	295.8	3	0	0	93	1012	7
6	3	9	68	7	-2.2	0.056	-9	-9	-999	30	7	0.562	0.7	0.64	0.8	69	10	298.4	3	0	0	100	1012	0
6	3	9	68	8	65.8	0.24	0.749	0.005	230	270	-18.9	0.562	0.7	0.28	1.3	77	10	301	3	0	0	88	1013	0
6	3	9	68	9	95.4	0.244	1.094	0.005	496	277	-13.8	0.212	0.48	0.2	1.8	87	10	302.8	3	0	0	70	1014	0
6	3	9	68	10	154.5	0.315	1.552	0.005	877	407	-18.3	0.562	0.7	0.18	1.7	85	10	304.4	3	0	0	63	1014	5
6	3	9	68	11	146.7	0.255	1.609	0.005	1027	297	-10.2	0.212	0.48	0.18	1.8	87	10	305.4	3	0	0	57	1013	6
6	3	9	68	12	120.1	0.243	1.558	0.005	1138	276	-10.8	0.562	0.7	0.18	1.2	63	10	304.6	3	0	0	56	1012	9
6	3	9	68	13	145.9	0.339	1.726	0.005	1273	454	-24.1	0.562	0.7	0.18	1.9	14	10	303.6	3	0	0	55	1012	8
6	3	9	68	14	114.1	0.343	1.634	0.005	1381	461	-31.8	0.562	0.7	0.18	2	78	10	304.4	3	0	0	57	1011	9
6	3	9	68	15	58.3	0.336	1.322	0.005	1432	448	-58.8	0.562	0.7	0.18	2.1	62	10	303	3	0	0	63	1011	10
6	3	9	68	16	58.4	0.349	1.338	0.005	1481	473	-65.3	0.562	0.7	0.19	2.2	53	10	301.4	3	0	0	77	1011	9
6	3	9	68	17	17.9	0.249	0.905	0.006	1495	290	-78.2	0.562	0.7	0.22	1.6	77	10	300.8	3	0	0	82	1012	10
6	3	9	68	18	0.1	0.167	0.161	0.006	1489	159	-4225.2	0.562	0.7	0.38	1.2	72	10	298.9	3	0	0	82	1012	3
6	3	9	68	19	-2.8	0.063	-9	-9	-999	43	7.7	0.562	0.7	1	0.9	45	10	297.9	3	0	0	79	1012	3
6	3	9	68	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	45	10	297.8	3	0	0	90	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	9	68	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	46	10	297.1	3	0	0	90	1013	7
6	3	9	68	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	60	10	296.9	3	0	0	90	1013	7
6	3	9	68	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	68	10	297	3	0	0	87	1013	7
6	3	9	68	24	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	68	10	296.9	3	0	0	97	1013	7
6	3	10	69	1	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	63	10	296.2	3	0	0	90	1012	7
6	3	10	69	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	61	10	295.9	3	0	0	82	1011	0
6	3	10	69	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	295.5	3	0	0	84	1011	7
6	3	10	69	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	89	10	295.9	3	0	0	84	1011	7
6	3	10	69	5	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	87	10	295.8	3	0	0	87	1011	7
6	3	10	69	6	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	106	10	295.9	3	0	0	90	1012	7
6	3	10	69	7	-4.2	0.076	-9	-9	-999	49	9.6	0.562	0.7	0.64	1.1	84	10	299	3	0	0	84	1013	0
6	3	10	69	8	59.7	0.233	0.715	0.005	221	259	-19.2	0.212	0.48	0.28	1.8	86	10	301.1	3	0	0	77	1014	0
6	3	10	69	9	108.2	0.341	1.104	0.005	450	458	-33.1	0.562	0.7	0.2	2	84	10	302.4	3	0	0	68	1015	0
6	3	10	69	10	174.6	0.382	1.622	0.005	885	544	-28.9	0.562	0.7	0.18	2.2	84	10	304.2	3	0	0	59	1014	0
6	3	10	69	11	165.5	0.277	1.666	0.005	1012	341	-11.7	0.212	0.48	0.18	2	95	10	305.1	3	0	0	59	1014	0
6	3	10	69	12	141	0.263	1.634	0.005	1121	311	-11.7	0.212	0.48	0.18	1.9	93	10	305.4	3	0	0	52	1013	7
6	3	10	69	13	118.4	0.269	1.583	0.005	1211	320	-14.8	0.212	0.48	0.18	2	99	10	304.9	3	0	0	55	1013	8
6	3	10	69	14	98.9	0.264	1.521	0.005	1286	312	-16.8	0.212	0.48	0.18	2	101	10	304.5	3	0	0	52	1012	9
6	3	10	69	15	74.6	0.248	1.406	0.005	1343	283	-18.3	0.212	0.48	0.18	1.9	102	10	304.2	3	0	0	55	1011	9
6	3	10	69	16	39.4	0.253	1.143	0.005	1370	293	-37.2	0.212	0.48	0.19	2.1	103	10	302.9	3	0	0	63	1011	10
6	3	10	69	17	4.2	0.196	0.542	0.005	1367	201	-163	0.212	0.48	0.23	1.8	96	10	300.8	3	0	0	63	1012	10
6	3	10	69	18	0.1	0.125	0.156	0.005	1364	103	-1772.3	0.212	0.48	0.38	1.2	96	10	299.4	3	0	0	67	1012	3
6	3	10	69	19	-3.5	0.069	-9	-9	-999	43	8.6	0.562	0.7	1	1	70	10	298.5	3	0	0	74	1012	3
6	3	10	69	20	-4.4	0.076	-9	-9	-999	49	9.3	0.562	0.7	1	1.1	73	10	298	3	0	0	79	1012	0
6	3	10	69	21	-2.8	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	86	10	297.4	3	0	0	79	1013	3
6	3	10	69	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	296.9	3	0	0	79	1013	3
6	3	10	69	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	91	10	296.5	3	0	0	85	1013	3
6	3	10	69	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	83	10	296.4	3	0	0	90	1012	3
6	3	11	70	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	78	10	296.4	3	0	0	97	1012	7
6	3	11	70	2	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	66	10	296.1	3	0	0	93	1011	7
6	3	11	70	3	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	76	10	296.2	3	0	0	97	1011	7
6	3	11	70	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	69	10	296.1	3	0	0	90	1011	7
6	3	11	70	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	80	10	296.4	3	0	0	93	1011	7
6	3	11	70	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	296.9	3	0	0	97	1012	7
6	3	11	70	7	-3.2	0.062	-9	-9	-999	36	6.8	0.212	0.48	0.63	1.2	92	10	297	3	0	0.76	97	1013	0
6	3	11	70	8	21.3	0.139	0.445	0.006	149	119	-11.4	0.212	0.48	0.28	1	98	10	297.4	3	0	0	93	1013	8
6	3	11	70	9	65.9	0.187	0.789	0.005	270	187	-9	0.212	0.48	0.2	1.3	111	10	299.5	3	0	0	88	1014	7
6	3	11	70	10	101.1	0.274	1.074	0.005	443	329	-18.3	0.212	0.48	0.18	2.1	100	10	301.6	3	0	0	77	1014	7
6	3	11	70	11	129.3	0.318	1.423	0.005	806	412	-22.4	0.212	0.48	0.18	2.5	109	10	303.4	3	0	0	59	1014	7
6	3	11	70	12	164.3	0.315	1.751	0.005	1182	407	-17.2	0.212	0.48	0.18	2.4	96	10	304.4	3	0	0	55	1013	6
6	3	11	70	13	133	0.319	1.648	0.005	1216	414	-22	0.212	0.48	0.18	2.5	94	10	304.2	3	0	0	59	1012	8
6	3	11	70	14	114.8	0.315	1.582	0.005	1246	406	-24.5	0.212	0.48	0.18	2.5	92	10	303.9	3	0	0	55	1012	8
6	3	11	70	15	93.6	0.31	1.532	0.005	1388	396	-28.6	0.212	0.48	0.18	2.5	92	10	303.6	3	0	0	55	1011	8
6	3	11	70	16	55.5	0.269	1.318	0.005	1490	322	-31.8	0.212	0.48	0.19	2.2	100	10	302.9	3	0	0	59	1011	9
6	3	11	70	17	14.2	0.218	0.839	0.005	1497	235	-65.8	0.212	0.48	0.23	1.9	90	10	301.1	3	0	0	61	1012	10
6	3	11	70	18	0.1	0.195	0.161	0.005	1495	198	-6686.5	0.562	0.7	0.38	1.4	81	10	299.4	3	0	0	65	1012	3
6	3	11	70	19	-4.3	0.076	-9	-9	-999	58	9.5	0.562	0.7	1	1.1	71	10	298.1	3	0	0	69	1012	3
6	3	11	70	20	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	83	10	297.4	3	0	0	74	1013	7
6	3	11	70	21	-2.5	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	87	10	296.9	3	0	0	69	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	11	70	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	296.4	3	0	0	84	1014	7
6	3	11	70	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	296.2	3	0	0	82	1013	7
6	3	11	70	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	295.9	3	0	0	93	1013	7
6	3	12	71	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	295.5	3	0	0	93	1012	7
6	3	12	71	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	295.5	3	0	0	90	1011	7
6	3	12	71	3	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	69	10	295	3	0	0	100	1011	3
6	3	12	71	4	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	71	10	294.8	3	0	0	93	1011	7
6	3	12	71	5	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	74	10	294.5	3	0	0	97	1011	7
6	3	12	71	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	294.9	3	0	0	93	1012	7
6	3	12	71	7	-4.9	0.083	-9	-9	-999	55	10.6	0.562	0.7	0.62	1.2	77	10	298.5	3	0	0	93	1013	0
6	3	12	71	8	65.3	0.245	0.835	0.005	323	278	-20.2	0.212	0.48	0.28	1.9	88	10	301	3	0	0	77	1013	0
6	3	12	71	9	134.2	0.373	1.441	0.005	808	523	-34.9	0.562	0.7	0.2	2.2	82	10	302.4	3	0	0	59	1014	0
6	3	12	71	10	157.9	0.342	1.828	0.011	1401	460	-22.8	0.562	0.7	0.18	1.9	78	10	303.8	3	0	0	51	1014	5
6	3	12	71	11	154.9	0.295	1.834	0.01	1443	369	-15	0.212	0.48	0.18	2.2	93	10	304.1	3	0	0	51	1014	5
6	3	12	71	12	214.8	0.403	2.067	0.008	1488	588	-27.4	0.562	0.7	0.18	2.3	78	10	304.9	3	0	0	41	1013	5
6	3	12	71	13	155.8	0.266	1.871	0.007	1521	326	-10.9	0.212	0.48	0.18	1.9	86	10	305	3	0	0	38	1012	7
6	3	12	71	14	133.1	0.272	1.79	0.007	1556	326	-13.6	0.212	0.48	0.18	2	88	10	304.6	3	0	0	45	1011	7
6	3	12	71	15	93.8	0.262	1.602	0.006	1581	309	-17.3	0.212	0.48	0.18	2	102	10	304	3	0	0	46	1010	8
6	3	12	71	16	52.6	0.259	1.325	0.006	1594	303	-29.7	0.212	0.48	0.19	2.1	100	10	303	3	0	0	46	1010	9
6	3	12	71	17	15.7	0.21	0.886	0.006	1596	222	-53.2	0.212	0.48	0.22	1.8	99	10	301.2	3	0	0	55	1010	10
6	3	12	71	18	0.1	0.125	0.164	0.006	1594	104	-1770	0.212	0.48	0.38	1.2	87	10	299.2	3	0	0	60	1010	7
6	3	12	71	19	-2	0.052	-9	-9	-999	29	6.3	0.212	0.48	1	1	89	10	298	3	0	0	65	1010	7
6	3	12	71	20	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	67	10	297.5	3	0	0	71	1011	7
6	3	12	71	21	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	71	10	296.8	3	0	0	79	1012	3
6	3	12	71	22	-8	0.111	-9	-9	-999	85	15.5	0.562	0.7	1	1.6	72	10	296.4	3	0	0	84	1012	7
6	3	12	71	23	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	80	10	296.2	3	0	0	97	1012	7
6	3	12	71	24	-5.3	0.09	-9	-9	-999	62	12.5	0.562	0.7	1	1.3	84	10	296	3	0	0.76	97	1011	7
6	3	13	72	1	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	78	10	295.8	3	0	0	97	1010	7
6	3	13	72	2	-3.1	0.069	-9	-9	-999	42	9.6	0.562	0.7	1	1	74	10	295.8	3	0	0	93	1009	7
6	3	13	72	3	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	60	10	295.6	3	0	0	97	1009	7
6	3	13	72	4	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	67	10	295.8	3	0	0	97	1009	7
6	3	13	72	5	-4.3	0.09	-9	-9	-999	62	15.4	0.562	0.7	1	1.3	58	10	295.4	3	0	1.52	93	1010	10
6	3	13	72	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	295.4	3	0	0	97	1010	7
6	3	13	72	7	-8.8	0.111	-9	-9	-999	85	14.1	0.562	0.7	0.62	1.6	73	10	296.4	3	0	0.25	97	1012	0
6	3	13	72	8	45.4	0.256	0.653	0.005	221	297	-33.2	0.562	0.7	0.28	1.5	69	10	298.9	3	0	0.25	97	1012	0
6	3	13	72	9	78	0.282	0.979	0.005	435	345	-26	0.562	0.7	0.2	1.6	75	10	298.6	3	0	0.25	92	1013	8
6	3	13	72	10	102.7	0.315	1.265	0.006	712	407	-27.5	0.562	0.7	0.18	1.8	67	10	298.9	3	0	0.25	88	1013	8
6	3	13	72	11	117.7	0.344	1.392	0.006	829	463	-31.1	0.562	0.7	0.18	2	79	10	300.9	3	0	0	72	1013	9
6	3	13	72	12	113.7	0.314	1.413	0.006	897	406	-24.7	0.212	0.48	0.18	2.5	88	10	301.4	3	0	0	63	1012	8
6	3	13	72	13	127.4	0.29	1.509	0.006	975	359	-17.2	0.212	0.48	0.18	2.2	90	10	301.9	3	0	0	77	1011	8
6	3	13	72	14	88.6	0.318	1.362	0.006	1028	412	-32.6	0.212	0.48	0.18	2.6	100	10	301.8	3	0	0	69	1010	9
6	3	13	72	15	33.7	0.232	0.993	0.006	1046	259	-33.2	0.212	0.48	0.18	1.9	127	10	299.2	3	0	1.02	63	1010	10
6	3	13	72	16	22.5	0.188	0.871	0.006	1057	187	-26.4	0.212	0.48	0.19	1.5	92	10	297.9	3	0	0	82	1010	10
6	3	13	72	17	1.5	0.151	0.352	0.006	1057	136	-210.3	0.212	0.48	0.22	1.4	93	10	297.5	3	0	0	90	1010	10
6	3	13	72	18	0.1	0.095	0.143	0.006	1057	67	-762	0.212	0.48	0.38	0.9	97	10	297.4	3	0	0	94	1009	7
6	3	13	72	19	-4.5	0.078	-9	-9	-999	50	9.4	0.212	0.48	1	1.5	99	10	296.9	3	0	1.02	94	1010	7
6	3	13	72	20	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	73	10	296.2	3	0	0.25	90	1010	7
6	3	13	72	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	296.4	3	0	0	90	1010	7
6	3	13	72	22	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	90	10	296.4	3	0	0	90	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	13	72	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	92	10	296.2	3	0	0	90	1010	7
6	3	13	72	24	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	79	10	296.2	3	0	0	94	1010	0
6	3	14	73	1	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	100	10	296.2	3	0	0	94	1009	3
6	3	14	73	2	-1.6	0.056	-9	-9	-999	30	9.5	0.562	0.7	1	0.8	62	10	296.4	3	0	0	97	1009	10
6	3	14	73	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	52	10	296.1	3	0	0	94	1008	7
6	3	14	73	4	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	55	10	296	3	0	0	100	1008	7
6	3	14	73	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	68	10	295.9	3	0	0	97	1009	7
6	3	14	73	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	296	3	0	0	97	1009	7
6	3	14	73	7	-2.2	0.052	-9	-9	-999	27	5.7	0.212	0.48	0.61	1	104	10	297.2	3	0	0.51	92	1010	0
6	3	14	73	8	32.1	0.203	0.565	0.005	203	210	-23.3	0.212	0.48	0.28	1.6	92	10	299.4	3	0	0	88	1011	0
6	3	14	73	9	75.2	0.248	0.891	0.005	339	284	-18.2	0.212	0.48	0.2	1.9	103	10	300.6	3	0	0	77	1012	7
6	3	14	73	10	19.6	0.204	0.586	0.005	372	212	-39.1	0.212	0.48	0.18	1.7	125	10	297.4	3	0	5.84	88	1013	10
6	3	14	73	11	99.7	0.264	1.153	0.005	554	311	-16.6	0.562	0.7	0.18	1.4	74	10	299.2	3	0	0	77	1011	9
6	3	14	73	12	148.8	0.314	1.633	0.006	1057	405	-18.8	0.562	0.7	0.18	1.7	76	10	302.1	3	0	0	82	1010	8
6	3	14	73	13	30.9	0.267	1.005	0.009	1186	319	-55.8	0.212	0.48	0.18	2.3	113	10	299.2	3	0	5.84	82	1010	10
6	3	14	73	14	10.7	0.101	0.707	0.009	1190	99	-8.8	0.212	0.48	0.18	0.7	98	10	297.4	3	0	5.08	85	1010	10
6	3	14	73	15	19.5	0.126	0.866	0.009	1199	103	-9.2	0.562	0.7	0.18	0.6	38	10	297.9	3	0	1.27	88	1009	10
6	3	14	73	16	11.7	0.193	0.732	0.009	1204	195	-55.3	0.562	0.7	0.19	1.2	36	10	297.9	3	0	0.51	94	1009	10
6	3	14	73	17	1.7	0.161	0.381	0.009	1204	148	-225.4	0.562	0.7	0.22	1.1	48	10	297	3	0	0	97	1010	10
6	3	14	73	18	0.1	0.181	0.15	0.009	1203	177	-5354.3	0.562	0.7	0.38	1.3	67	10	296.5	3	0	4.06	100	1010	0
6	3	14	73	19	-5.3	0.09	-9	-9	-999	65	12.6	0.562	0.7	1	1.3	60	10	296.5	3	0	15.49	100	1011	7
6	3	14	73	20	-2	0.057	-9	-9	-999	31	8.4	0.212	0.48	1	1.1	107	10	297	3	0	4.83	94	1012	10
6	3	14	73	21	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	105	10	297.8	3	0	0.25	100	1012	7
6	3	14	73	22	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	101	10	297.9	3	0	0	94	1013	7
6	3	14	73	23	-1.3	0.047	-9	-9	-999	23	6.9	0.212	0.48	1	0.9	102	10	297.6	3	0	0	94	1013	10
6	3	14	73	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	88	10	297.5	3	0	0	94	1013	7
6	3	15	74	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	106	10	297.8	3	0	0	94	1012	7
6	3	15	74	2	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	108	10	297.8	3	0	0	94	1012	7
6	3	15	74	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	297.5	3	0	0	94	1011	7
6	3	15	74	4	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	94	10	297.2	3	0	0	94	1012	7
6	3	15	74	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	71	10	297.2	3	0	0	90	1012	7
6	3	15	74	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	51	10	297	3	0	0	88	1012	7
6	3	15	74	7	-2.2	0.052	-9	-9	-999	27	5.8	0.212	0.48	0.61	1	102	10	298.6	3	0	0	88	1013	0
6	3	15	74	8	36.5	0.195	-9	-9	-999	198	-18.4	0.212	0.48	0.28	1.5	110	10	300.4	3	0	0	88	1014	5
6	3	15	74	9	67	0.255	-9	-9	-999	295	-22.2	0.212	0.48	0.2	2	117	10	301.6	3	0	0	79	1014	8
6	3	15	74	10	106.3	0.294	-9	-9	-999	366	-21.6	0.212	0.48	0.18	2.3	118	10	303	3	0	0	75	1015	7
6	3	15	74	11	119	0.306	-9	-9	-999	390	-21.8	0.212	0.48	0.18	2.4	108	10	303.4	3	0	0	80	1014	8
6	3	15	74	12	111.8	0.314	-9	-9	-999	404	-25	0.212	0.48	0.18	2.5	114	10	303.5	3	0	0	65	1014	8
6	3	15	74	13	92.4	0.309	-9	-9	-999	396	-28.9	0.212	0.48	0.18	2.5	120	10	303.4	3	0	0	70	1013	9
6	3	15	74	14	68.2	0.274	-9	-9	-999	330	-27.2	0.212	0.48	0.18	2.2	118	10	302.9	3	0	0	65	1012	9
6	3	15	74	15	76.9	0.286	-9	-9	-999	352	-27.5	0.212	0.48	0.18	2.3	120	10	302.8	3	0	0	65	1011	9
6	3	15	74	16	42.1	0.273	-9	-9	-999	328	-43.6	0.212	0.48	0.19	2.3	108	10	302.4	3	0	0	63	1010	10
6	3	15	74	17	7	0.21	-9	-9	-999	223	-119.7	0.212	0.48	0.22	1.9	104	10	300.8	3	0	0	67	1011	10
6	3	15	74	18	0.1	0.156	-9	-9	-999	142	-3431.9	0.212	0.48	0.38	1.5	106	10	299.8	3	0	0	72	1011	7
6	3	15	74	19	-2.9	0.062	-9	-9	-999	40	7.5	0.212	0.48	1	1.2	105	10	299.1	3	0	0	82	1011	7
6	3	15	74	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	90	10	298.9	3	0	0	85	1012	7
6	3	15	74	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	298.4	3	0	0	82	1012	7
6	3	15	74	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	83	10	298.2	3	0	0	82	1013	7
6	3	15	74	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	87	10	298.4	3	0	0	85	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	15	74	24	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	81	10	298.4	3	0	0	88	1013	7
6	3	16	75	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	298	3	0	0	88	1012	7
6	3	16	75	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	78	10	297.8	3	0	0	88	1012	7
6	3	16	75	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	85	10	297.8	3	0	0	88	1012	7
6	3	16	75	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	104	10	297.4	3	0	0	85	1012	7
6	3	16	75	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	297.4	3	0	0	87	1013	7
6	3	16	75	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	69	10	297.1	3	0	0	90	1013	7
6	3	16	75	7	-5.7	0.09	-9	-9	-999	62	11.8	0.562	0.7	0.6	1.3	74	10	299.5	3	0	0	85	1013	0
6	3	16	75	8	62.2	0.272	0.76	0.005	255	326	-29.2	0.212	0.48	0.28	2.2	87	10	301.5	3	0	0	77	1014	0
6	3	16	75	9	110.5	0.304	1.179	0.005	537	386	-23	0.212	0.48	0.2	2.4	94	10	303.1	3	0	0	72	1015	0
6	3	16	75	10	130.3	0.281	1.43	0.005	813	342	-15.3	0.212	0.48	0.18	2.1	92	10	303.9	3	0	0	63	1015	5
6	3	16	75	11	150.7	0.285	1.569	0.005	929	349	-13.8	0.212	0.48	0.18	2.1	96	10	304.4	3	0	0	55	1014	6
6	3	16	75	12	139.1	0.292	1.585	0.005	1036	363	-16.2	0.212	0.48	0.18	2.2	100	10	304.5	3	0	0	55	1013	7
6	3	16	75	13	89.9	0.28	1.401	0.005	1105	341	-22.1	0.212	0.48	0.18	2.2	110	10	304.5	3	0	0	59	1012	9
6	3	16	75	14	95.6	0.272	1.461	0.005	1178	327	-19	0.212	0.48	0.18	2.1	105	10	304	3	0	0	53	1012	9
6	3	16	75	15	92.2	0.29	1.472	0.005	1249	360	-23.9	0.212	0.48	0.18	2.3	110	10	303.9	3	0	0	59	1011	8
6	3	16	75	16	49.5	0.267	1.207	0.005	1284	318	-34.7	0.212	0.48	0.19	2.2	102	10	302.5	3	0	0	59	1011	9
6	3	16	75	17	9.9	0.223	0.707	0.005	1287	243	-101.7	0.212	0.48	0.22	2	101	10	300.9	3	0	0	67	1011	10
6	3	16	75	18	0.1	0.146	0.153	0.005	1283	130	-2796.5	0.212	0.48	0.38	1.4	102	10	299.1	3	0	0	69	1011	7
6	3	16	75	19	-2.9	0.062	-9	-9	-999	39	7.5	0.212	0.48	1	1.2	86	10	298.2	3	0	0	69	1012	7
6	3	16	75	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	66	10	297.4	3	0	0	77	1012	7
6	3	16	75	21	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	74	10	297	3	0	0	74	1013	7
6	3	16	75	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	73	10	296.5	3	0	0	74	1013	7
6	3	16	75	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	296.1	3	0	0	84	1013	7
6	3	16	75	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	108	10	295.9	3	0	0	84	1013	7
6	3	17	76	1	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	104	10	295.5	3	0	0	90	1012	7
6	3	17	76	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	117	10	295.2	3	0	0	84	1012	7
6	3	17	76	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	117	10	295.2	3	0	0	100	1011	7
6	3	17	76	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	117	10	295	3	0	0	93	1011	7
6	3	17	76	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	112	10	294.9	3	0	0	93	1012	7
6	3	17	76	6	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	106	10	295.5	3	0	0	93	1012	7
6	3	17	76	7	-1.1	0.036	-9	-9	-999	16	4.1	0.212	0.48	0.59	0.7	95	10	298.9	3	0	0	93	1013	0
6	3	17	76	8	82.6	0.194	0.791	0.006	216	196	-8	0.562	0.7	0.27	0.9	57	10	301.4	3	0	0	74	1014	0
6	3	17	76	9	111.2	0.254	1.053	0.007	380	295	-13.4	0.562	0.7	0.2	1.3	80	10	302.4	3	0	0	67	1015	5
6	3	17	76	10	133	0.242	1.285	0.006	578	275	-9.7	0.212	0.48	0.18	1.7	88	10	303.5	3	0	0	63	1014	4
6	3	17	76	11	178.2	0.32	1.587	0.005	813	416	-16.6	0.562	0.7	0.18	1.7	83	10	304	3	0	0	57	1014	7
6	3	17	76	12	149.7	0.255	1.571	0.005	937	298	-10	0.212	0.48	0.18	1.8	99	10	304.9	3	0	0	51	1013	7
6	3	17	76	13	66.7	-9	-9	-9	1012	-999	-99999	0.475	0.6	0.17	0	0	10	304.6	3	0	0	48	1012	10
6	3	17	76	14	58.4	0.155	1.204	0.005	1077	141	-5.8	0.212	0.48	0.18	1	103	10	304.1	3	0	0	45	1011	10
6	3	17	76	15	35.4	0.135	1.03	0.006	1113	114	-6.3	0.562	0.7	0.18	0.6	29	10	302.8	3	0	0	52	1010	10
6	3	17	76	16	25.9	0.208	0.936	0.006	1142	219	-31.5	0.212	0.48	0.19	1.7	105	10	302.4	3	0	0	52	1010	10
6	3	17	76	17	11.4	0.197	0.715	0.006	1151	200	-59.9	0.212	0.48	0.22	1.7	95	10	301.1	3	0	0	61	1010	10
6	3	17	76	18	0.1	0.153	0.147	0.006	1146	139	-3258.6	0.562	0.7	0.38	1.1	84	10	299.8	3	0	0	69	1010	7
6	3	17	76	19	-2.5	0.063	-9	-9	-999	40	8.7	0.562	0.7	1	0.9	66	10	298.9	3	0	0	79	1011	7
6	3	17	76	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	52	10	298.5	3	0	0	74	1012	7
6	3	17	76	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	51	10	297.9	3	0	0	79	1012	3
6	3	17	76	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	49	10	297.4	3	0	0	90	1012	3
6	3	17	76	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	297.1	3	0	0	90	1012	3
6	3	17	76	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	85	10	297.1	3	0	0	90	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	18	77	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	296.6	3	0	0	90	1010	3
6	3	18	77	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	63	10	296	3	0	0	93	1010	0
6	3	18	77	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	62	10	296	3	0	0	97	1010	3
6	3	18	77	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	296.2	3	0	0	97	1010	3
6	3	18	77	5	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	78	10	296	3	0	0	97	1010	0
6	3	18	77	6	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	296.5	3	0	0	97	1011	3
6	3	18	77	7	-2.6	0.057	-9	-9	-999	31	6.5	0.212	0.48	0.59	1.1	96	10	299.1	3	0	0	97	1012	0
6	3	18	77	8	60	0.233	0.676	0.006	186	259	-19.1	0.212	0.48	0.27	1.8	89	10	301.6	3	0	0	77	1012	0
6	3	18	77	9	94.4	0.253	0.971	0.005	350	293	-15.6	0.212	0.48	0.2	1.9	87	10	302.8	3	0	0	74	1013	0
6	3	18	77	10	124.4	0.251	1.251	0.005	568	288	-11.4	0.212	0.48	0.18	1.8	92	10	303.8	3	0	0	63	1013	6
6	3	18	77	11	110.3	0.257	1.33	0.005	772	300	-13.9	0.212	0.48	0.18	1.9	101	10	303.8	3	0	0	63	1012	8
6	3	18	77	12	105.4	0.316	1.379	0.005	897	408	-27	0.562	0.7	0.18	1.8	84	10	302.4	3	0	0.25	63	1012	9
6	3	18	77	13	71.6	0.209	1.243	0.005	969	224	-11.4	0.212	0.48	0.18	1.5	104	10	303.4	3	0	0	55	1011	10
6	3	18	77	14	62	0.16	1.209	0.005	1028	147	-5.9	0.562	0.7	0.18	0.7	21	10	302.6	3	0	0	59	1010	10
6	3	18	77	15	54	0.157	1.175	0.005	1081	143	-6.4	0.562	0.7	0.18	0.7	20	10	302.2	3	0	0	59	1009	10
6	3	18	77	16	18.5	0.175	0.827	0.005	1099	168	-26.1	0.212	0.48	0.19	1.4	109	10	302.4	3	0	0	63	1009	10
6	3	18	77	17	2.9	0.165	0.447	0.005	1099	154	-138.2	0.212	0.48	0.22	1.5	98	10	301	3	0	0	67	1009	10
6	3	18	77	18	0.1	0.136	0.145	0.005	1096	115	-2241.8	0.212	0.48	0.38	1.3	104	10	299.8	3	0	0	72	1010	7
6	3	18	77	19	-2.4	0.057	-9	-9	-999	34	6.9	0.212	0.48	1	1.1	96	10	298.9	3	0	0	82	1010	7
6	3	18	77	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	103	10	298	3	0	0	82	1011	0
6	3	18	77	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	92	10	297.5	3	0	0	88	1011	3
6	3	18	77	22	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	85	10	297.4	3	0	0	94	1012	0
6	3	18	77	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	88	10	297.1	3	0	0	90	1012	0
6	3	18	77	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.9	81	10	297	3	0	0	90	1011	99
6	3	19	78	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	297.2	3	0	0	90	1010	7
6	3	19	78	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	297.2	3	0	0	100	1010	7
6	3	19	78	3	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	84	10	297.2	3	0	0	100	1010	7
6	3	19	78	4	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	88	10	297.1	3	0	0	94	1010	7
6	3	19	78	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	87	10	297	3	0	0	100	1010	7
6	3	19	78	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	71	10	297	3	0	0	94	1011	7
6	3	19	78	7	-4.7	0.083	-9	-9	-999	55	11	0.562	0.7	0.58	1.2	72	10	297.6	3	0	0	92	1012	0
6	3	19	78	8	38.6	0.264	0.613	0.005	215	313	-43.2	0.562	0.7	0.27	1.6	75	10	298.9	3	0	0	90	1013	8
6	3	19	78	9	105.6	0.198	1.063	0.005	411	204	-6.6	0.212	0.48	0.2	1.3	97	10	301.6	3	0	0	94	1013	0
6	3	19	78	10	130.1	0.223	1.331	0.005	655	242	-7.7	0.212	0.48	0.18	1.5	111	10	303.4	3	0	0	77	1013	5
6	3	19	78	11	110.4	0.209	1.404	0.005	906	220	-7.5	0.212	0.48	0.18	1.4	109	10	303.9	3	0	0	68	1012	8
6	3	19	78	12	119.7	0.24	1.515	0.005	1050	270	-10.4	0.212	0.48	0.18	1.7	111	10	304.4	3	0	0	63	1011	8
6	3	19	78	13	32.8	0.184	0.994	0.005	1080	183	-17.2	0.212	0.48	0.18	1.4	133	10	300.2	3	0	0.51	63	1010	10
6	3	19	78	14	71.9	0.257	1.325	0.005	1168	299	-21.2	0.687	0.8	0.18	1.3	163	10	301	3	0	7.37	63	1009	10
6	3	19	78	15	15.9	0.145	0.807	0.005	1183	132	-17.1	0.212	0.48	0.18	1.1	105	10	299.4	3	0	1.52	63	1009	10
6	3	19	78	16	12.8	0.151	0.753	0.005	1198	135	-24.3	0.212	0.48	0.19	1.2	86	10	299.4	3	0	0.25	70	1008	10
6	3	19	78	17	3.6	0.138	0.493	0.005	1202	118	-65.8	0.212	0.48	0.22	1.2	96	10	299.2	3	0	0	74	1009	10
6	3	19	78	18	0.1	0.105	0.15	0.005	1200	78	-1035	0.212	0.48	0.38	1	90	10	298.5	3	0	0	82	1009	7
6	3	19	78	19	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	83	10	298.1	3	0	0	94	1010	7
6	3	19	78	20	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	82	10	297.9	3	0	0	82	1010	7
6	3	19	78	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	77	10	297.6	3	0	0	82	1011	7
6	3	19	78	22	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	84	10	297.5	3	0	0	88	1011	7
6	3	19	78	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	77	10	297.4	3	0	0	88	1011	0
6	3	19	78	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	61	10	297.1	3	0	0	88	1011	3
6	3	20	79	1	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	78	10	297.2	3	0	0	88	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	20	79	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	297.4	3	0	0	94	1010	7
6	3	20	79	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	61	10	297	3	0	0	88	1010	7
6	3	20	79	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	297	3	0	0	94	1010	7
6	3	20	79	5	-8	0.111	-9	-9	-999	85	15.5	0.562	0.7	1	1.6	81	10	296.6	3	0	11.68	94	1010	7
6	3	20	79	6	-5.8	0.088	-9	-9	-999	60	10.6	0.212	0.48	1	1.7	88	10	296	3	0	12.45	90	1012	7
6	3	20	79	7	-4	0.076	-9	-9	-999	49	10.1	0.562	0.7	0.58	1.1	59	10	296.1	3	0	3.81	100	1012	0
6	3	20	79	8	38.1	0.202	0.594	0.006	198	209	-19.5	0.562	0.7	0.27	1.1	58	10	297.6	3	0	0	97	1012	8
6	3	20	79	9	52.7	0.222	0.747	0.005	286	240	-18.7	0.562	0.7	0.2	1.2	68	10	299.1	3	0	1.02	94	1013	9
6	3	20	79	10	34.5	0.213	0.689	0.005	342	226	-25.1	0.562	0.7	0.18	1.2	59	10	297.9	3	0	6.86	94	1013	10
6	3	20	79	11	52.5	0.235	0.854	0.005	429	261	-22.2	0.562	0.7	0.18	1.3	42	10	299.2	3	0	0.25	94	1013	10
6	3	20	79	12	52.9	0.21	0.913	0.005	518	221	-15.7	0.562	0.7	0.18	1.1	63	10	300	3	0	0	94	1012	10
6	3	20	79	13	53.6	0.272	0.981	0.005	636	326	-33.8	0.562	0.7	0.18	1.6	61	10	301.2	3	0	0	82	1010	10
6	3	20	79	14	42	0.217	0.95	0.005	735	233	-21.9	0.562	0.7	0.18	1.2	84	10	300.9	3	0	0.25	72	1010	10
6	3	20	79	15	33.2	0.194	0.946	0.005	918	196	-19.7	0.212	0.48	0.18	1.5	106	10	301.4	3	0	0	70	1009	10
6	3	20	79	16	21	0.228	0.817	0.005	935	250	-50.5	0.562	0.7	0.19	1.4	83	10	301.2	3	0	0	67	1009	10
6	3	20	79	17	5	0.195	0.508	0.005	939	198	-133.1	0.562	0.7	0.22	1.3	75	10	300.1	3	0	0	74	1009	10
6	3	20	79	18	0.1	0.126	0.138	0.005	937	104	-1800.4	0.562	0.7	0.38	0.9	78	10	299.1	3	0	0	74	1010	7
6	3	20	79	19	-2	0.056	-9	-9	-999	32	7.8	0.562	0.7	1	0.8	79	10	298.4	3	0	0	79	1010	7
6	3	20	79	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	297.9	3	0	0	85	1011	7
6	3	20	79	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	112	10	297.4	3	0	0	88	1012	7
6	3	20	79	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	79	10	297.1	3	0	0	85	1012	7
6	3	20	79	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	297	3	0	0	94	1012	0
6	3	20	79	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	297	3	0	0	100	1012	7
6	3	21	80	1	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	61	10	296.9	3	0	0	94	1011	7
6	3	21	80	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	75	10	296.5	3	0	0	97	1010	7
6	3	21	80	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	92	10	296.4	3	0	0	90	1010	7
6	3	21	80	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	296.4	3	0	0	97	1010	7
6	3	21	80	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	67	10	296	3	0	0	97	1011	7
6	3	21	80	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	296.4	3	0	0	97	1012	3
6	3	21	80	7	-2.1	0.052	-9	-9	-999	27	6.1	0.212	0.48	0.57	1	86	10	299.2	3	0	0	94	1012	0
6	3	21	80	8	60.3	0.224	0.632	0.005	151	244	-16.9	0.212	0.48	0.27	1.7	107	10	301.4	3	0	0	79	1013	0
6	3	21	80	9	93.5	0.244	1.001	0.005	388	277	-14	0.212	0.48	0.2	1.8	114	10	302.8	3	0	0	74	1013	4
6	3	21	80	10	134.7	0.282	1.396	0.006	730	344	-15	0.212	0.48	0.18	2.1	108	10	303.9	3	0	0	65	1013	4
6	3	21	80	11	146.2	0.293	1.528	0.006	883	365	-15.6	0.212	0.48	0.18	2.2	114	10	304.4	3	0	0	63	1013	6
6	3	21	80	12	125.8	0.298	1.496	0.006	962	375	-19	0.212	0.48	0.18	2.3	113	10	304.6	3	0	0	63	1012	8
6	3	21	80	13	112.5	0.295	1.476	0.005	1033	369	-20.7	0.212	0.48	0.18	2.3	110	10	304.9	3	0	0	63	1012	8
6	3	21	80	14	124.3	0.288	1.564	0.005	1110	356	-17.4	0.212	0.48	0.18	2.2	109	10	304.9	3	0	0	59	1011	8
6	3	21	80	15	89.5	0.28	1.425	0.005	1165	341	-22.1	0.212	0.48	0.18	2.2	110	10	304.2	3	0	0	59	1010	9
6	3	21	80	16	42.3	0.273	1.118	0.005	1189	329	-43.4	0.212	0.48	0.19	2.3	106	10	302.9	3	0	0	59	1010	10
6	3	21	80	17	8.7	0.203	0.659	0.005	1191	212	-87	0.212	0.48	0.22	1.8	110	10	301.2	3	0	0	63	1010	10
6	3	21	80	18	0.1	0.156	0.149	0.005	1188	142	-3431.9	0.212	0.48	0.38	1.5	109	10	299.8	3	0	0	74	1011	7
6	3	21	80	19	-2.9	0.062	-9	-9	-999	40	7.5	0.212	0.48	1	1.2	112	10	298.6	3	0	0	79	1011	7
6	3	21	80	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	103	10	298.1	3	0	0	85	1012	0
6	3	21	80	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	297.8	3	0	0	88	1012	7
6	3	21	80	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	71	10	297.4	3	0	0	88	1013	7
6	3	21	80	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	69	10	297.1	3	0	0	90	1013	0
6	3	21	80	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	75	10	296.8	3	0	0	88	1012	7
6	3	22	81	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	296.8	3	0	0	94	1011	7
6	3	22	81	2	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	89	10	296.8	3	0	0	90	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	22	81	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	296.6	3	0	0	90	1011	7
6	3	22	81	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	65	10	296.2	3	0	0	94	1011	7
6	3	22	81	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	296.5	3	0	0	94	1012	7
6	3	22	81	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	71	10	297.1	3	0	0	94	1012	7
6	3	22	81	7	-2.5	0.057	-9	-9	-999	31	6.8	0.212	0.48	0.56	1.1	86	10	299.5	3	0	0	88	1013	0
6	3	22	81	8	59.3	0.242	0.914	0.005	465	275	-21.7	0.212	0.48	0.27	1.9	98	10	301.8	3	0	0	85	1014	0
6	3	22	81	9	93.4	0.281	1.288	0.005	829	343	-21.5	0.212	0.48	0.2	2.2	107	10	302.9	3	0	0	77	1014	2
6	3	22	81	10	137.4	0.32	1.528	0.005	939	415	-21.5	0.212	0.48	0.18	2.5	110	10	303.9	3	0	0	67	1014	0
6	3	22	81	11	128.4	0.29	1.547	0.005	1043	359	-17.1	0.212	0.48	0.18	2.2	103	10	304.4	3	0	0	65	1013	7
6	3	22	81	12	91.1	0.281	1.412	0.005	1116	342	-21.9	0.212	0.48	0.18	2.2	107	10	303.9	3	0	0	63	1013	9
6	3	22	81	13	112.2	0.295	1.553	0.005	1207	369	-20.7	0.212	0.48	0.18	2.3	113	10	304.4	3	0	0	59	1012	8
6	3	22	81	14	92.5	0.3	1.485	0.005	1277	378	-26.3	0.212	0.48	0.18	2.4	109	10	303.8	3	0	0	65	1011	9
6	3	22	81	15	49.6	0.295	1.216	0.005	1310	368	-46.6	0.212	0.48	0.18	2.5	113	10	301.4	3	0	0	63	1011	10
6	3	22	81	16	26.8	0.256	0.996	0.005	1329	298	-56.2	0.212	0.48	0.19	2.2	113	10	301	3	0	0	67	1011	10
6	3	22	81	17	8.3	0.212	0.676	0.005	1334	225	-103.1	0.212	0.48	0.22	1.9	110	10	300.5	3	0	0	65	1011	10
6	3	22	81	18	0.1	0.136	0.155	0.005	1332	116	-2244.8	0.212	0.48	0.38	1.3	108	10	299.4	3	0	0	77	1011	7
6	3	22	81	19	-1.6	0.047	-9	-9	-999	28	5.6	0.212	0.48	1	0.9	100	10	298.6	3	0	0	82	1012	7
6	3	22	81	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	93	10	298	3	0	0	88	1012	7
6	3	22	81	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	80	10	297.6	3	0	0	88	1013	3
6	3	22	81	22	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	297.1	3	0	0	85	1013	3
6	3	22	81	23	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	79	10	297	3	0	0	87	1013	0
6	3	22	81	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	64	10	296.8	3	0	0	90	1013	3
6	3	23	82	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	296.4	3	0	0	90	1012	3
6	3	23	82	2	-0.8	0.031	-9	-9	-999	13	3.2	0.212	0.48	1	0.6	93	10	296.1	3	0	0	87	1012	0
6	3	23	82	3	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	74	10	296	3	0	0	90	1012	0
6	3	23	82	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	53	10	295.9	3	0	0	97	1012	3
6	3	23	82	5	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	62	10	295.8	3	0	0	90	1013	3
6	3	23	82	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	296.6	3	0	0	90	1013	3
6	3	23	82	7	-2.9	0.062	-9	-9	-999	36	7.4	0.212	0.48	0.56	1.2	106	10	299.5	3	0	0	90	1014	0
6	3	23	82	8	65.9	0.273	0.96	0.005	485	328	-28	0.212	0.48	0.27	2.2	116	10	301.4	3	0	0	74	1014	0
6	3	23	82	9	110.7	0.304	1.369	0.006	840	386	-23	0.212	0.48	0.2	2.4	114	10	302.8	3	0	0	72	1015	0
6	3	23	82	10	138.9	0.292	1.566	0.007	1002	363	-16.2	0.212	0.48	0.18	2.2	118	10	303.9	3	0	0	59	1015	0
6	3	23	82	11	155.2	0.286	1.667	0.007	1082	351	-13.6	0.212	0.48	0.18	2.1	114	10	304.5	3	0	0	55	1014	5
6	3	23	82	12	137.8	0.292	1.637	0.007	1153	362	-16.3	0.212	0.48	0.18	2.2	115	10	304.8	3	0	0	52	1013	8
6	3	23	82	13	112.3	0.286	1.555	0.007	1210	351	-18.8	0.212	0.48	0.18	2.2	106	10	304.5	3	0	0	51	1013	8
6	3	23	82	14	119.7	0.278	1.615	0.007	1272	338	-16.3	0.212	0.48	0.18	2.1	115	10	304.5	3	0	0	50	1012	8
6	3	23	82	15	92.3	0.271	1.5	0.007	1319	325	-19.5	0.212	0.48	0.18	2.1	115	10	304	3	0	0	48	1011	8
6	3	23	82	16	45.4	0.228	1.19	0.007	1341	250	-23.4	0.212	0.48	0.19	1.8	106	10	303.2	3	0	0	55	1011	9
6	3	23	82	17	11.5	0.215	0.753	0.007	1344	230	-78.7	0.212	0.48	0.22	1.9	101	10	301.2	3	0	0	57	1011	10
6	3	23	82	18	0.1	0.146	0.155	0.007	1340	129	-2797.4	0.212	0.48	0.38	1.4	107	10	299.4	3	0	0	65	1012	3
6	3	23	82	19	-2	0.052	-9	-9	-999	33	6.3	0.212	0.48	1	1	102	10	298.2	3	0	0	74	1012	7
6	3	23	82	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	86	10	297.5	3	0	0	82	1012	3
6	3	23	82	21	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	79	10	296.9	3	0	0	79	1013	3
6	3	23	82	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	89	10	296.5	3	0	0	79	1013	3
6	3	23	82	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	99	10	296.2	3	0	0	84	1013	3
6	3	23	82	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	295.9	3	0	0	84	1012	3
6	3	24	83	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	295.5	3	0	0	93	1012	3
6	3	24	83	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	295.2	3	0	0	87	1011	3
6	3	24	83	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	294.9	3	0	0	87	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	24	83	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	294.4	3	0	0	87	1011	3
6	3	24	83	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	67	10	294.1	3	0	0	93	1012	0
6	3	24	83	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	295.2	3	0	0	93	1012	3
6	3	24	83	7	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	0.55	0.9	88	10	299.2	3	0	0	87	1013	0
6	3	24	83	8	71.4	0.199	0.807	0.005	266	204	-10	0.212	0.48	0.26	1.4	96	10	301.4	3	0	0	84	1014	0
6	3	24	83	9	116.5	0.259	1.157	0.006	481	303	-13.4	0.212	0.48	0.2	1.9	108	10	302.8	3	0	0	63	1014	0
6	3	24	83	10	137.6	0.263	1.409	0.008	737	310	-12	0.212	0.48	0.18	1.9	104	10	303.8	3	0	0	59	1014	3
6	3	24	83	11	146.2	0.284	1.518	0.009	865	348	-14.1	0.212	0.48	0.18	2.1	112	10	304.4	3	0	0	53	1014	6
6	3	24	83	12	157.1	0.257	1.614	0.008	968	299	-9.7	0.212	0.48	0.18	1.8	105	10	304.9	3	0	0	48	1013	6
6	3	24	83	13	110.9	0.267	1.494	0.008	1087	317	-15.5	0.212	0.48	0.18	2	104	10	304.6	3	0	0	48	1012	9
6	3	24	83	14	131.7	0.272	1.6	0.007	1123	325	-13.7	0.212	0.48	0.18	2	102	10	304.6	3	0	0	50	1011	8
6	3	24	83	15	95.2	0.282	1.447	0.007	1148	344	-21.1	0.212	0.48	0.18	2.2	108	10	303.9	3	0	0	51	1010	8
6	3	24	83	16	54	0.26	1.203	0.007	1162	304	-29.2	0.212	0.48	0.19	2.1	99	10	302.9	3	0	0	51	1010	9
6	3	24	83	17	14.2	0.218	0.771	0.007	1164	235	-66	0.212	0.48	0.22	1.9	108	10	300.9	3	0	0	59	1010	10
6	3	24	83	18	0.1	0.156	0.148	0.007	1162	143	-3431.9	0.212	0.48	0.38	1.5	108	10	298.9	3	0	0	60	1011	3
6	3	24	83	19	-2.3	0.052	-9	-9	-999	36	5.6	0.212	0.48	1	1	114	10	297.6	3	0	0	74	1011	3
6	3	24	83	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	107	10	296.9	3	0	0	74	1012	3
6	3	24	83	21	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	98	10	296.4	3	0	0	79	1012	3
6	3	24	83	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	93	10	296.2	3	0	0	79	1012	3
6	3	24	83	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	48	10	295.6	3	0	0	82	1013	3
6	3	24	83	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	295	3	0	0	84	1012	3
6	3	25	84	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	295.5	3	0	0	87	1012	3
6	3	25	84	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	295.5	3	0	0	87	1011	3
6	3	25	84	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	295.8	3	0	0	87	1011	3
6	3	25	84	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	53	10	294.9	3	0	0	87	1012	3
6	3	25	84	5	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	60	10	294.6	3	0	0	93	1012	3
6	3	25	84	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	91	10	296	3	0	0	93	1013	3
6	3	25	84	7	-2	0.052	-9	-9	-999	27	6.4	0.212	0.48	0.55	1	106	10	299.9	3	0	0	97	1013	0
6	3	25	84	8	51.7	0.23	0.623	0.005	169	254	-21.3	0.212	0.48	0.26	1.8	119	10	301.9	3	0	0	82	1014	0
6	3	25	84	9	103.7	0.274	0.981	0.005	330	330	-18	0.212	0.48	0.2	2.1	124	10	303.2	3	0	0	70	1014	0
6	3	25	84	10	138	0.282	1.314	0.005	595	345	-14.7	0.212	0.48	0.18	2.1	120	10	304.5	3	0	0	65	1015	3
6	3	25	84	11	164.4	0.297	1.617	0.005	932	372	-14.4	0.212	0.48	0.18	2.2	125	10	305.2	3	0	0	63	1014	4
6	3	25	84	12	138.2	0.301	1.609	0.007	1090	379	-17.8	0.212	0.48	0.18	2.3	119	10	305.5	3	0	0	59	1013	8
6	3	25	84	13	99.3	0.273	1.492	0.007	1207	329	-18.5	0.212	0.48	0.18	2.1	115	10	305.4	3	0	0	59	1012	9
6	3	25	84	14	88.4	0.28	1.481	0.008	1328	340	-22.4	0.212	0.48	0.18	2.2	111	10	304.4	3	0	0	61	1011	9
6	3	25	84	15	96.7	0.32	1.558	0.009	1410	416	-30.5	0.212	0.48	0.18	2.6	122	10	303.9	3	0	0	61	1011	8
6	3	25	84	16	51.2	0.296	1.262	0.009	1417	370	-45.4	0.212	0.48	0.19	2.5	122	10	303	3	0	0	63	1010	9
6	3	25	84	17	10.3	0.233	0.74	0.009	1418	261	-111.4	0.212	0.48	0.22	2.1	114	10	301.8	3	0	0	70	1010	10
6	3	25	84	18	0.1	0.156	0.158	0.009	1417	144	-3430.8	0.212	0.48	0.38	1.5	111	10	300.2	3	0	0	74	1010	3
6	3	25	84	19	-2.7	0.057	-9	-9	-999	38	6.1	0.212	0.48	1	1.1	108	10	299.1	3	0	0	77	1011	3
6	3	25	84	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	107	10	298.6	3	0	0	85	1012	0
6	3	25	84	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	112	10	298.4	3	0	0	88	1012	3
6	3	25	84	22	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	105	10	298.4	3	0	0	94	1013	3
6	3	25	84	23	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	102	10	298.4	3	0	0	91	1012	0
6	3	25	84	24	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	113	10	298.1	3	0	0	94	1012	3
6	3	26	85	1	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	112	10	298.2	3	0	0	94	1011	3
6	3	26	85	2	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	105	10	297.9	3	0	0	94	1011	3
6	3	26	85	3	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	112	10	297.8	3	0	0	94	1011	3
6	3	26	85	4	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	108	10	297.9	3	0	0	94	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	26	85	5	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	110	10	298	3	0	0	91	1012	3
6	3	26	85	6	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	118	10	298.8	3	0	0	94	1013	7
6	3	26	85	7	-3.8	0.073	-9	-9	-999	45	9.1	0.212	0.48	0.54	1.4	118	10	300.9	3	0	0	88	1014	0
6	3	26	85	8	40.7	0.216	0.742	0.005	363	231	-22.4	0.212	0.48	0.26	1.7	111	10	301	3	0	0	79	1014	6
6	3	26	85	9	93.3	0.319	1.283	0.005	819	414	-31.4	0.212	0.48	0.2	2.6	117	10	302.9	3	0	0	74	1015	0
6	3	26	85	10	137.9	0.329	1.551	0.005	981	434	-23.4	0.212	0.48	0.18	2.6	122	10	304.4	3	0	0	63	1015	2
6	3	26	85	11	134.3	0.338	1.616	0.006	1138	451	-25.9	0.212	0.48	0.18	2.7	115	10	304.2	3	0	0	63	1015	7
6	3	26	85	12	122.7	0.316	1.616	0.007	1246	410	-23.3	0.212	0.48	0.18	2.5	114	10	304.5	3	0	0	63	1014	8
6	3	26	85	13	107.9	0.351	1.57	0.006	1297	477	-36.1	0.212	0.48	0.18	2.9	120	10	304.5	3	0	0	59	1013	9
6	3	26	85	14	112.2	0.342	1.613	0.006	1351	461	-32.3	0.212	0.48	0.18	2.8	119	10	304.5	3	0	0	57	1013	8
6	3	26	85	15	77.6	0.314	1.439	0.006	1388	406	-36.1	0.212	0.48	0.18	2.6	127	10	304.1	3	0	0	55	1012	9
6	3	26	85	16	46.8	0.313	1.223	0.006	1409	402	-58.8	0.212	0.48	0.19	2.7	123	10	303.1	3	0	0	67	1011	9
6	3	26	85	17	10.1	0.233	0.734	0.006	1412	261	-113.2	0.212	0.48	0.22	2.1	113	10	301.4	3	0	0	61	1012	10
6	3	26	85	18	0.1	0.166	0.158	0.006	1409	157	-4161.4	0.212	0.48	0.38	1.6	108	10	299.8	3	0	0	72	1012	3
6	3	26	85	19	-3.3	0.062	-9	-9	-999	43	6.7	0.212	0.48	1	1.2	105	10	299.1	3	0	0	77	1012	3
6	3	26	85	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	107	10	298.6	3	0	0	82	1013	3
6	3	26	85	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	110	10	298.4	3	0	0	82	1014	3
6	3	26	85	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	106	10	298	3	0	0	82	1015	3
6	3	26	85	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	105	10	297.8	3	0	0	88	1014	3
6	3	26	85	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	94	10	297.5	3	0	0	88	1014	3
6	3	27	86	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	297.4	3	0	0	88	1013	3
6	3	27	86	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	297	3	0	0	88	1013	3
6	3	27	86	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	296.9	3	0	0	88	1013	3
6	3	27	86	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	92	10	296.9	3	0	0	94	1013	3
6	3	27	86	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	296.6	3	0	0	94	1013	3
6	3	27	86	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	106	10	297.4	3	0	0	94	1014	3
6	3	27	86	7	-3.3	0.067	-9	-9	-999	40	8.5	0.212	0.48	0.54	1.3	108	10	300	3	0	0	88	1015	0
6	3	27	86	8	62.8	0.262	1.058	0.006	683	309	-26.1	0.212	0.48	0.26	2.1	108	10	302.1	3	0	0	79	1016	0
6	3	27	86	9	112.8	0.314	1.344	0.005	781	405	-24.9	0.212	0.48	0.2	2.5	118	10	303.8	3	0	0	67	1016	0
6	3	27	86	10	129.3	0.346	1.452	0.005	858	468	-29.1	0.212	0.48	0.18	2.8	126	10	304.4	3	0	0	55	1016	6
6	3	27	86	11	156.9	0.323	1.612	0.005	969	423	-19.5	0.212	0.48	0.18	2.5	122	10	304.9	3	0	0	61	1016	5
6	3	27	86	12	131.8	0.318	1.585	0.005	1096	413	-22.2	0.212	0.48	0.18	2.5	121	10	304.8	3	0	0	59	1015	8
6	3	27	86	13	109.4	0.313	1.54	0.005	1208	403	-25.4	0.212	0.48	0.18	2.5	122	10	304.6	3	0	0	61	1014	9
6	3	27	86	14	121.2	0.325	1.667	0.005	1382	427	-25.7	0.212	0.48	0.18	2.6	120	10	304.6	3	0	0	67	1013	8
6	3	27	86	15	86.7	0.308	1.534	0.007	1506	393	-30.3	0.212	0.48	0.18	2.5	125	10	304.4	3	0	0	55	1013	9
6	3	27	86	16	49.9	0.295	1.295	0.008	1576	369	-46.5	0.212	0.48	0.19	2.5	123	10	303.4	3	0	0	59	1013	9
6	3	27	86	17	7.4	0.201	0.686	0.008	1578	211	-100	0.212	0.48	0.22	1.8	116	10	301.5	3	0	0	65	1013	10
6	3	27	86	18	0.1	0.125	0.164	0.008	1571	103	-1774.6	0.212	0.48	0.38	1.2	115	10	300	3	0	0	72	1013	3
6	3	27	86	19	-1.8	0.047	-9	-9	-999	26	5	0.212	0.48	1	0.9	108	10	298.9	3	0	0	74	1014	3
6	3	27	86	20	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	102	10	298.5	3	0	0	82	1014	3
6	3	27	86	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	298.2	3	0	0	82	1015	3
6	3	27	86	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	62	10	298	3	0	0	88	1015	3
6	3	27	86	23	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	74	10	297.8	3	0	0	88	1015	3
6	3	27	86	24	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	85	10	297.4	3	0	0	88	1015	3
6	3	28	87	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	87	10	296.9	3	0	0	88	1014	3
6	3	28	87	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	296.9	3	0	0	90	1014	0
6	3	28	87	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	296.6	3	0	0	94	1013	3
6	3	28	87	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	72	10	296.2	3	0	0	100	1014	3
6	3	28	87	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	67	10	296	3	0	0	90	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	28	87	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	296.8	3	0	0	97	1015	3
6	3	28	87	7	-1.6	0.047	-9	-9	-999	23	5.9	0.212	0.48	0.53	0.9	101	10	300	3	0	0	90	1016	0
6	3	28	87	8	56.1	0.194	0.766	0.005	291	196	-11.8	0.212	0.48	0.26	1.4	110	10	301.9	3	0	0	79	1017	0
6	3	28	87	9	106.8	0.275	1.22	0.005	616	332	-17.6	0.212	0.48	0.2	2.1	107	10	303.4	3	0	0	67	1017	0
6	3	28	87	10	130.6	0.299	1.475	0.005	892	376	-18.6	0.212	0.48	0.18	2.3	107	10	304.1	3	0	0	63	1017	5
6	3	28	87	11	144.9	0.302	1.656	0.005	1139	382	-17.2	0.212	0.48	0.18	2.3	115	10	304.6	3	0	0	54	1017	6
6	3	28	87	12	146.8	0.284	1.779	0.009	1392	348	-14.1	0.212	0.48	0.18	2.1	114	10	305	3	0	0	55	1016	7
6	3	28	87	13	124.2	0.307	1.769	0.013	1615	392	-21.1	0.212	0.48	0.18	2.4	118	10	304.5	3	0	0	52	1015	8
6	3	28	87	14	119.7	0.297	1.764	0.012	1664	372	-19.8	0.212	0.48	0.18	2.3	113	10	304.4	3	0	0	54	1015	8
6	3	28	87	15	86.4	0.279	1.587	0.012	1677	339	-22.8	0.212	0.48	0.18	2.2	113	10	303.9	3	0	0	52	1014	9
6	3	28	87	16	40.7	0.254	1.237	0.012	1682	294	-36.3	0.212	0.48	0.19	2.1	111	10	302.5	3	0	0	55	1014	10
6	3	28	87	17	10.1	0.204	0.777	0.012	1683	213	-76.8	0.212	0.48	0.22	1.8	113	10	301.2	3	0	0	61	1014	10
6	3	28	87	18	0.1	0.105	0.167	0.012	1682	82	-1040.1	0.212	0.48	0.38	1	92	10	299.4	3	0	0	65	1014	7
6	3	28	87	19	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	85	10	298.4	3	0	0	74	1015	7
6	3	28	87	20	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	96	10	297.5	3	0	0	79	1015	0
6	3	28	87	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	81	10	297.1	3	0	0	79	1016	3
6	3	28	87	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	296.8	3	0	0	84	1016	3
6	3	28	87	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	109	10	296.2	3	0	0	93	1015	3
6	3	28	87	24	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	108	10	295.5	3	0	0	93	1014	0
6	3	29	88	1	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	80	10	295.1	3	0	0	93	1014	0
6	3	29	88	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	118	10	295	3	0	0	93	1013	3
6	3	29	88	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	89	10	295	3	0	0	93	1013	3
6	3	29	88	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	98	10	295.2	3	0	0	93	1014	3
6	3	29	88	5	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	85	10	294.8	3	0	0	93	1014	3
6	3	29	88	6	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	78	10	295.8	3	0	0	93	1015	3
6	3	29	88	7	-2.4	0.063	-9	-9	-999	36	9.3	0.562	0.7	0.53	0.9	78	10	298.9	3	0	0	93	1015	0
6	3	29	88	8	69.3	0.198	0.426	0.007	40	203	-10.2	0.212	0.48	0.26	1.4	94	10	300.9	3	0	0	74	1016	0
6	3	29	88	9	106.6	0.227	0.671	0.007	103	249	-10	0.212	0.48	0.2	1.6	92	10	302.8	3	0	0	59	1017	0
6	3	29	88	10	125.9	0.231	0.85	0.007	177	256	-8.9	0.212	0.48	0.18	1.6	102	10	303.4	3	0	0	51	1017	6
6	3	29	88	11	135.8	0.243	0.987	0.007	257	275	-9.6	0.212	0.48	0.18	1.7	102	10	304.2	3	0	0	50	1016	7
6	3	29	88	12	145.1	0.264	1.112	0.007	343	312	-11.5	0.212	0.48	0.18	1.9	111	10	304.6	3	0	0	48	1015	7
6	3	29	88	13	142.2	0.274	1.188	0.007	427	329	-13	0.212	0.48	0.18	2	106	10	304.8	3	0	0	52	1014	7
6	3	29	88	14	127.2	0.289	1.209	0.007	502	357	-17.2	0.212	0.48	0.18	2.2	107	10	304.6	3	0	0	52	1013	8
6	3	29	88	15	91	0.28	1.118	0.007	555	342	-21.9	0.212	0.48	0.18	2.2	116	10	304.2	3	0	0	52	1013	8
6	3	29	88	16	49.8	0.258	0.93	0.007	583	301	-31.1	0.212	0.48	0.19	2.1	106	10	303.2	3	0	0	55	1013	9
6	3	29	88	17	11.5	0.206	0.573	0.007	586	216	-68.4	0.212	0.48	0.22	1.8	103	10	301.4	3	0	0	59	1012	10
6	3	29	88	18	0.1	0.136	0.118	0.007	582	116	-2247.8	0.212	0.48	0.38	1.3	108	10	299.4	3	0	0	69	1013	3
6	3	29	88	19	-3.5	0.069	-9	-9	-999	43	8.6	0.562	0.7	1	1	83	10	298.4	3	0	0	79	1013	3
6	3	29	88	20	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	75	10	297.5	3	0	0	85	1013	0
6	3	29	88	21	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	68	10	297	3	0	0	85	1014	0
6	3	29	88	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	296.8	3	0	0	90	1014	3
6	3	29	88	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	58	10	296.4	3	0	0	93	1013	0
6	3	29	88	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	40	10	296.1	3	0	0	97	1013	3
6	3	30	89	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	44	10	295.9	3	0	0	90	1012	3
6	3	30	89	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	70	10	295.8	3	0	0	87	1012	0
6	3	30	89	3	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	85	10	295.9	3	0	0	90	1012	3
6	3	30	89	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	295.8	3	0	0	97	1012	3
6	3	30	89	5	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	83	10	295.8	3	0	0	93	1012	0
6	3	30	89	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	296.8	3	0	0	97	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	3	30	89	7	-2.3	0.063	-9	-9	-999	36	9.5	0.562	0.7	0.52	0.9	85	10	299.9	3	0	0	90	1014	0
6	3	30	89	8	65.7	0.235	0.861	0.005	351	262	-17.9	0.212	0.48	0.26	1.8	102	10	301.8	3	0	0	85	1015	0
6	3	30	89	9	105.3	0.266	1.282	0.005	725	315	-16.1	0.212	0.48	0.2	2	107	10	303.1	3	0	0	74	1015	0
6	3	30	89	10	131.9	0.281	1.486	0.005	901	342	-15.2	0.212	0.48	0.18	2.1	102	10	303.8	3	0	0	63	1015	5
6	3	30	89	11	140.4	0.301	1.623	0.005	1104	380	-17.6	0.212	0.48	0.18	2.3	107	10	304.4	3	0	0	59	1015	7
6	3	30	89	12	166.2	0.334	1.834	0.005	1345	445	-20.4	0.212	0.48	0.18	2.6	114	10	305	3	0	0	55	1014	6
6	3	30	89	13	134.9	0.3	1.788	0.008	1533	379	-18.1	0.212	0.48	0.18	2.3	108	10	304.9	3	0	0	55	1013	8
6	3	30	89	14	113.8	0.314	1.719	0.009	1615	405	-24.7	0.212	0.48	0.18	2.5	108	10	304.6	3	0	0	52	1013	8
6	3	30	89	15	91	0.3	1.621	0.01	1693	377	-26.7	0.212	0.48	0.18	2.4	110	10	304.1	3	0	0	55	1012	9
6	3	30	89	16	45.2	0.293	1.295	0.01	1737	365	-50.2	0.212	0.48	0.19	2.5	108	10	302.6	3	0	0	63	1012	10
6	3	30	89	17	10	0.252	0.785	0.01	1743	292	-144.7	0.212	0.48	0.22	2.3	113	10	301.1	3	0	0	67	1012	10
6	3	30	89	18	0.1	0.177	0.169	0.01	1737	173	-4988.8	0.212	0.48	0.38	1.7	111	10	299.6	3	0	0	74	1012	3
6	3	30	89	19	-3.3	0.062	-9	-9	-999	46	6.7	0.212	0.48	1	1.2	111	10	298.8	3	0	0	77	1013	3
6	3	30	89	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	92	10	298.1	3	0	0	85	1013	0
6	3	30	89	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	297.6	3	0	0	88	1014	3
6	3	30	89	22	-2.9	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	82	10	297.4	3	0	0	85	1014	3
6	3	30	89	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	74	10	296.9	3	0	0	87	1014	0
6	3	30	89	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	296.6	3	0	0	85	1013	3
6	3	31	90	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	66	10	296.2	3	0	0	90	1013	3
6	3	31	90	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	296.2	3	0	0	90	1013	0
6	3	31	90	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	112	10	296.4	3	0	0	90	1012	3
6	3	31	90	4	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	106	10	296.5	3	0	0	90	1013	3
6	3	31	90	5	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	106	10	296.5	3	0	0	90	1013	3
6	3	31	90	6	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	99	10	297.1	3	0	0	97	1014	7
6	3	31	90	7	-3.1	0.067	-9	-9	-999	40	9	0.212	0.48	0.52	1.3	109	10	299.8	3	0	0	85	1015	0
6	3	31	90	8	68.7	0.264	1.161	0.005	824	313	-24.4	0.212	0.48	0.26	2.1	118	10	302	3	0	0	82	1015	0
6	3	31	90	9	112.6	0.305	1.409	0.005	900	387	-22.7	0.212	0.48	0.2	2.4	117	10	303	3	0	0	67	1016	0
6	3	31	90	10	140.9	0.292	1.573	0.005	1002	363	-16	0.212	0.48	0.18	2.2	114	10	304.2	3	0	0	63	1016	3
6	3	31	90	11	148.1	0.294	1.663	0.005	1126	366	-15.5	0.212	0.48	0.18	2.2	114	10	304.9	3	0	0	53	1016	6
6	3	31	90	12	149.8	0.303	1.729	0.007	1251	384	-16.9	0.212	0.48	0.18	2.3	115	10	305	3	0	0	55	1015	7
6	3	31	90	13	141.1	0.301	1.748	0.009	1371	380	-17.5	0.212	0.48	0.18	2.3	118	10	305.4	3	0	0	45	1014	7
6	3	31	90	14	121.7	0.297	1.705	0.01	1473	373	-19.5	0.212	0.48	0.18	2.3	129	10	305.5	3	0	0	45	1013	8
6	3	31	90	15	92.7	0.309	1.606	0.011	1616	396	-28.9	0.212	0.48	0.18	2.5	123	10	304.6	3	0	0	48	1012	8
6	3	31	90	16	42.5	0.273	1.241	0.011	1622	329	-43.3	0.212	0.48	0.19	2.3	120	10	303.2	3	0	0	55	1012	10
6	3	31	90	17	13.2	0.236	0.84	0.011	1623	265	-90.3	0.212	0.48	0.22	2.1	125	10	301.9	3	0	0	67	1013	10
6	3	31	90	18	0.1	0.146	0.165	0.011	1622	131	-2801.1	0.212	0.48	0.38	1.4	115	10	299.9	3	0	0	72	1013	3
6	3	31	90	19	-2.3	0.052	-9	-9	-999	33	5.6	0.212	0.48	1	1	105	10	298.6	3	0	0	79	1013	3
6	3	31	90	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	88	10	298.2	3	0	0	85	1014	0
6	3	31	90	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	94	10	297.6	3	0	0	88	1014	3
6	3	31	90	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	106	10	297.1	3	0	0	85	1014	3
6	3	31	90	23	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	96	10	296.8	3	0	0	85	1014	0
6	3	31	90	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	80	10	296.5	3	0	0	86	1013	99
6	4	1	91	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	45	10	295.8	3	0	0	88	1012	99
6	4	1	91	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	58	10	295.2	3	0	0	90	1012	0
6	4	1	91	3	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.6	67	10	295.2	3	0	0	91	1012	99
6	4	1	91	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	67	10	295.4	3	0	0	93	1013	3
6	4	1	91	5	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	49	10	295	3	0	0	999	1013	3
6	4	1	91	6	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	51	10	295.8	3	0	0	999	1014	99
6	4	1	91	7	-1.8	0.052	-9	-9	-999	27	7	0.212	0.48	0.51	1	86	10	299.1	3	0	0	999	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	1	91	8	57.8	0.232	0.669	0.005	187	258	-19.7	0.212	0.48	0.25	1.8	101	10	301.6	3	0	0	79	1015	0
6	4	1	91	9	108.3	0.275	1.016	0.005	351	332	-17.4	0.212	0.48	0.2	2.1	109	10	302.9	3	0	0	72	1015	0
6	4	1	91	10	143.6	0.293	1.466	0.005	794	364	-15.8	0.212	0.48	0.18	2.2	113	10	304.1	3	0	0	59	1015	0
6	4	1	91	11	150.9	0.285	1.575	0.005	938	349	-13.8	0.212	0.48	0.18	2.1	114	10	304.6	3	0	0	53	1015	6
6	4	1	91	12	167.9	0.278	1.721	0.007	1100	337	-11.6	0.212	0.48	0.18	2	107	10	305.4	3	0	0	52	1014	6
6	4	1	91	13	150	0.285	1.727	0.008	1243	349	-13.9	0.212	0.48	0.18	2.1	108	10	305.4	3	0	0	48	1013	7
6	4	1	91	14	131.8	0.29	1.709	0.007	1369	360	-16.8	0.212	0.48	0.18	2.2	107	10	304.9	3	0	0	48	1012	8
6	4	1	91	15	95.4	0.272	1.558	0.007	1431	327	-19.1	0.212	0.48	0.18	2.1	116	10	304.2	3	0	0	48	1012	8
6	4	1	91	16	48.2	0.266	1.245	0.007	1444	316	-35.4	0.212	0.48	0.19	2.2	126	10	302.9	3	0	0	48	1011	9
6	4	1	91	17	15.7	0.29	0.857	0.007	1447	360	-140.8	0.687	0.8	0.23	1.8	141	10	301.2	3	0	0	53	1012	10
6	4	1	91	18	0.1	0.146	0.159	0.007	1444	141	-2797.4	0.212	0.48	0.38	1.4	110	10	299	3	0	0	60	1012	3
6	4	1	91	19	-1.8	0.047	-9	-9	-999	34	5	0.212	0.48	1	0.9	107	10	297.9	3	0	0	74	1012	3
6	4	1	91	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	108	10	296.9	3	0	0	79	1012	0
6	4	1	91	21	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	101	10	296.6	3	0	0	84	1013	0
6	4	1	91	22	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	77	10	296.4	3	0	0	90	1013	0
6	4	1	91	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	66	10	295.4	3	0	0	87	1012	0
6	4	1	91	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	295.2	3	0	0	93	1012	3
6	4	2	92	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	54	10	295	3	0	0	93	1011	3
6	4	2	92	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	51	10	294.5	3	0	0	93	1011	0
6	4	2	92	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	53	10	294.5	3	0	0	93	1011	3
6	4	2	92	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	294.9	3	0	0	93	1011	3
6	4	2	92	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	295	3	0	0	93	1012	3
6	4	2	92	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	103	10	295.9	3	0	0	93	1012	7
6	4	2	92	7	-1.8	0.052	-9	-9	-999	27	7.1	0.212	0.48	0.51	1	87	10	298.9	3	0	0	97	1013	0
6	4	2	92	8	61.8	0.215	0.783	0.005	280	230	-14.6	0.212	0.48	0.25	1.6	91	10	301.4	3	0	0	74	1013	0
6	4	2	92	9	105.3	0.227	1.196	0.005	588	249	-10	0.212	0.48	0.2	1.6	109	10	302.8	3	0	0	63	1014	0
6	4	2	92	10	121.7	0.211	1.432	0.005	872	223	-7	0.212	0.48	0.18	1.4	101	10	303.8	3	0	0	59	1013	7
6	4	2	92	11	163	0.229	1.647	0.005	992	251	-6.6	0.212	0.48	0.18	1.5	108	10	305	3	0	0	50	1013	5
6	4	2	92	12	152.8	0.216	1.667	0.005	1096	232	-6	0.212	0.48	0.18	1.4	93	10	305.1	3	0	0	45	1012	7
6	4	2	92	13	89.9	0.223	1.422	0.005	1156	243	-11.2	0.212	0.48	0.18	1.6	108	10	304.4	3	0	0	48	1011	9
6	4	2	92	14	37.1	0.224	1.066	0.005	1179	244	-27.4	0.212	0.48	0.18	1.8	113	10	303.1	3	0	0	52	1010	10
6	4	2	92	15	29.3	0.229	0.991	0.005	1198	252	-37	0.212	0.48	0.18	1.9	113	10	302.6	3	0	0	55	1010	10
6	4	2	92	16	7.8	0.192	0.638	0.005	1201	194	-82.3	0.212	0.48	0.19	1.7	112	10	301.4	3	0	0	55	1010	10
6	4	2	92	17	0.1	0.166	0.15	0.005	1200	156	-4154.5	0.212	0.48	0.22	1.6	112	10	300.5	3	0	0	61	1010	10
6	4	2	92	18	0.1	0.136	0.15	0.005	1198	115	-2242.6	0.212	0.48	0.38	1.3	104	10	299.2	3	0	0	69	1010	7
6	4	2	92	19	-2	0.052	-9	-9	-999	31	6.3	0.212	0.48	1	1	108	10	298.2	3	0	0	74	1010	7
6	4	2	92	20	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	101	10	297.6	3	0	0	74	1011	0
6	4	2	92	21	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	103	10	297.1	3	0	0	79	1012	3
6	4	2	92	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	296.5	3	0	0	84	1012	3
6	4	2	92	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	84	10	296.2	3	0	0	87	1011	0
6	4	2	92	24	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	99	10	295.9	3	0	0	84	1011	0
6	4	3	93	1	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	78	10	295.5	3	0	0	90	1010	3
6	4	3	93	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	71	10	295.5	3	0	0	93	1010	0
6	4	3	93	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	85	10	295.5	3	0	0	93	1010	3
6	4	3	93	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	65	10	295.2	3	0	0	93	1010	3
6	4	3	93	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	295.2	3	0	0	97	1011	3
6	4	3	93	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	296.4	3	0	0	93	1012	7
6	4	3	93	7	-1.4	0.047	-9	-9	-999	23	6.5	0.212	0.48	0.5	0.9	88	10	298.9	3	0	0	97	1013	0
6	4	3	93	8	47.5	0.171	0.602	0.007	166	163	-9.6	0.212	0.48	0.25	1.2	112	10	301	3	0	0	85	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	3	93	9	94	0.224	0.935	0.005	314	244	-10.9	0.212	0.48	0.19	1.6	121	10	302.4	3	0	0	74	1013	5
6	4	3	93	10	96.3	0.206	1.076	0.005	467	215	-8.2	0.212	0.48	0.18	1.4	114	10	303.4	3	0	0	72	1013	8
6	4	3	93	11	44.6	0.17	0.872	0.005	537	162	-10	0.212	0.48	0.18	1.2	125	10	303.2	3	0	0	61	1013	10
6	4	3	93	12	17.2	0.212	0.644	0.005	561	224	-49.8	0.562	0.7	0.18	1.3	348	10	300.6	3	0	0.51	65	1012	10
6	4	3	93	13	78	0.232	1.139	0.005	684	257	-14.4	0.562	0.7	0.18	1.2	345	10	300.8	3	0	0	61	1011	10
6	4	3	93	14	23.1	0.18	0.802	0.005	806	176	-22.7	0.562	0.7	0.18	1	348	10	301	3	0	0	63	1010	10
6	4	3	93	15	3.4	0.091	0.425	0.005	808	66	-20.1	0.562	0.7	0.18	0.5	342	10	299.8	3	0	0.51	67	1010	10
6	4	3	93	16	12.1	0.193	0.651	0.005	821	195	-53.4	0.687	0.8	0.19	1.1	142	10	300.4	3	0	0	67	1010	10
6	4	3	93	17	4	0.177	0.451	0.006	825	171	-124.8	0.212	0.48	0.22	1.6	122	10	300.2	3	0	0	65	1010	10
6	4	3	93	18	0.1	0.125	0.132	0.005	823	102	-1770	0.212	0.48	0.38	1.2	113	10	299.2	3	0	0	69	1010	7
6	4	3	93	19	-1.6	0.047	-9	-9	-999	26	5.6	0.212	0.48	1	0.9	109	10	298.4	3	0	0	74	1010	7
6	4	3	93	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	102	10	297.6	3	0	0	85	1011	7
6	4	3	93	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	297.1	3	0	0	85	1012	7
6	4	3	93	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	61	10	296.6	3	0	0	85	1012	3
6	4	3	93	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	50	10	296.5	3	0	0	87	1012	7
6	4	3	93	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	296.4	3	0	0	85	1012	7
6	4	4	94	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	296.1	3	0	0	90	1011	7
6	4	4	94	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	295.9	3	0	0	90	1010	7
6	4	4	94	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	84	10	295.9	3	0	0	97	1010	3
6	4	4	94	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	91	10	295.8	3	0	0	97	1011	3
6	4	4	94	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	121	10	296.2	3	0	0	93	1012	0
6	4	4	94	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	297.2	3	0	0	97	1012	3
6	4	4	94	7	-2.1	0.057	-9	-9	-999	31	8.2	0.212	0.48	0.5	1.1	88	10	300	3	0	0	90	1013	0
6	4	4	94	8	59.5	0.233	1.006	0.005	619	259	-19.2	0.212	0.48	0.25	1.8	111	10	301.6	3	0	0	77	1013	0
6	4	4	94	9	86.9	0.27	1.225	0.005	765	323	-20.5	0.212	0.48	0.19	2.1	113	10	302.6	3	0	0	63	1014	6
6	4	4	94	10	139.3	0.292	1.615	0.006	1093	363	-16.1	0.212	0.48	0.18	2.2	118	10	303.8	3	0	0	55	1013	4
6	4	4	94	11	131.5	0.281	1.611	0.008	1151	342	-15.2	0.212	0.48	0.18	2.1	120	10	304.4	3	0	0	52	1013	7
6	4	4	94	12	131.8	0.272	1.642	0.008	1214	326	-13.7	0.212	0.48	0.18	2	105	10	304.9	3	0	0	55	1012	8
6	4	4	94	13	68.9	0.265	1.336	0.009	1250	313	-24.2	0.212	0.48	0.18	2.1	116	10	304.1	3	0	0	59	1011	10
6	4	4	94	14	70	0.284	1.357	0.008	1287	348	-29.5	0.212	0.48	0.18	2.3	115	10	303.5	3	0	0	52	1010	9
6	4	4	94	15	87.9	0.308	1.482	0.008	1334	393	-30	0.212	0.48	0.18	2.5	123	10	303.9	3	0	0	49	1010	9
6	4	4	94	16	40.8	0.263	1.153	0.008	1355	311	-40.2	0.212	0.48	0.19	2.2	114	10	302.8	3	0	0	55	1009	10
6	4	4	94	17	10.1	0.233	0.726	0.008	1358	259	-112.6	0.212	0.48	0.22	2.1	110	10	301.4	3	0	0	63	1010	10
6	4	4	94	18	0.1	0.177	0.156	0.008	1356	172	-4978.9	0.212	0.48	0.38	1.7	104	10	299.9	3	0	0	72	1010	3
6	4	4	94	19	-3.8	0.067	-9	-9	-999	48	7.2	0.212	0.48	1	1.3	105	10	298.9	3	0	0	74	1010	3
6	4	4	94	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	100	10	298.2	3	0	0	79	1011	0
6	4	4	94	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	86	10	297.6	3	0	0	82	1011	3
6	4	4	94	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	88	10	297.5	3	0	0	82	1012	3
6	4	4	94	23	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	297.4	3	0	0	88	1012	7
6	4	4	94	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	92	10	297.1	3	0	0	82	1011	3
6	4	5	95	1	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	98	10	297.2	3	0	0	88	1010	3
6	4	5	95	2	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	94	10	297.4	3	0	0	88	1010	3
6	4	5	95	3	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	104	10	297.2	3	0	0	88	1010	3
6	4	5	95	4	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	99	10	297.4	3	0	0	88	1010	3
6	4	5	95	5	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	111	10	297	3	0	0	94	1011	7
6	4	5	95	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	84	10	297.6	3	0	0	94	1012	7
6	4	5	95	7	-2.8	0.067	-9	-9	-999	40	9.9	0.212	0.48	0.49	1.3	107	10	300.4	3	0	0	100	1013	0
6	4	5	95	8	66.6	0.273	0.742	0.005	222	329	-27.7	0.212	0.48	0.25	2.2	112	10	302.1	3	0	0	85	1013	0
6	4	5	95	9	104.2	0.293	1.071	0.005	426	365	-21.9	0.212	0.48	0.19	2.3	113	10	303.4	3	0	0	70	1013	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	5	95	10	105.5	0.266	1.227	0.005	633	315	-16	0.212	0.48	0.18	2	112	10	303.9	3	0	0	70	1013	8
6	4	5	95	11	166.1	0.316	1.606	0.005	902	408	-17.1	0.212	0.48	0.18	2.4	116	10	305.2	3	0	0	63	1013	5
6	4	5	95	12	146.9	0.303	1.651	0.005	1107	384	-17.1	0.212	0.48	0.18	2.3	110	10	305.2	3	0	0	63	1012	7
6	4	5	95	13	139.5	0.301	1.702	0.006	1275	380	-17.6	0.212	0.48	0.18	2.3	121	10	305.2	3	0	0	55	1010	8
6	4	5	95	14	97.5	0.292	1.526	0.006	1315	362	-22.9	0.212	0.48	0.18	2.3	114	10	304.8	3	0	0	57	1010	9
6	4	5	95	15	79	0.277	1.434	0.006	1347	336	-24.3	0.212	0.48	0.18	2.2	108	10	303.9	3	0	0	59	1009	9
6	4	5	95	16	42.4	0.264	1.17	0.006	1363	312	-39.1	0.212	0.48	0.19	2.2	107	10	302.9	3	0	0	59	1009	10
6	4	5	95	17	11.6	0.206	0.761	0.006	1366	216	-67.9	0.212	0.48	0.22	1.8	109	10	301.6	3	0	0	63	1010	10
6	4	5	95	18	0.1	0.146	0.156	0.006	1363	129	-2792.8	0.212	0.48	0.38	1.4	100	10	299.8	3	0	0	69	1010	3
6	4	5	95	19	-3.3	0.062	-9	-9	-999	39	6.7	0.212	0.48	1	1.2	86	10	298.8	3	0	0	79	1010	3
6	4	5	95	20	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	84	10	297.9	3	0	0	79	1011	3
6	4	5	95	21	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	74	10	297.2	3	0	0	85	1011	3
6	4	5	95	22	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	76	10	296.9	3	0	0	85	1012	3
6	4	5	95	23	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	79	10	296.5	3	0	0	85	1012	3
6	4	5	95	24	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	87	10	296.5	3	0	0	90	1011	3
6	4	6	96	1	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	93	10	296.4	3	0	0	90	1010	3
6	4	6	96	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	296	3	0	0	93	1010	7
6	4	6	96	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	296.1	3	0	0	97	1010	3
6	4	6	96	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	295.9	3	0	0	97	1010	7
6	4	6	96	5	-0.8	0.031	-9	-9	-999	13	3.2	0.212	0.48	1	0.6	87	10	295.8	3	0	0	97	1011	0
6	4	6	96	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	297.1	3	0	0	97	1011	7
6	4	6	96	7	-2.7	0.067	-9	-9	-999	40	10.1	0.212	0.48	0.49	1.3	104	10	300.2	3	0	0	94	1012	0
6	4	6	96	8	58.5	0.252	0.725	0.005	235	290	-24.6	0.212	0.48	0.25	2	112	10	301.9	3	0	0	88	1013	0
6	4	6	96	9	81.2	0.278	0.94	0.005	370	337	-23.8	0.212	0.48	0.19	2.2	117	10	302.8	3	0	0	70	1013	7
6	4	6	96	10	69	0.302	0.973	0.005	483	382	-36.1	0.212	0.48	0.18	2.5	128	10	301.9	3	0	0	70	1013	9
6	4	6	96	11	69.4	0.265	1.048	0.005	598	314	-24.1	0.212	0.48	0.18	2.1	134	10	302.4	3	0	0	65	1013	9
6	4	6	96	12	90.5	0.261	1.233	0.005	748	308	-17.8	0.212	0.48	0.18	2	126	10	302.5	3	0	0	63	1012	9
6	4	6	96	13	98.6	0.301	1.324	0.005	849	380	-25	0.212	0.48	0.18	2.4	127	10	303.9	3	0	0	56	1010	9
6	4	6	96	14	110.7	0.314	1.424	0.005	941	404	-25.1	0.212	0.48	0.18	2.5	122	10	304.5	3	0	0	59	1009	8
6	4	6	96	15	77.4	0.314	1.291	0.005	1003	405	-36.1	0.212	0.48	0.18	2.6	118	10	303.8	3	0	0	52	1009	9
6	4	6	96	16	45.3	0.293	1.093	0.005	1038	365	-50.1	0.212	0.48	0.19	2.5	120	10	302.9	3	0	0	55	1009	10
6	4	6	96	17	8.7	0.213	0.633	0.005	1042	228	-99.1	0.212	0.48	0.22	1.9	113	10	301.4	3	0	0	63	1009	10
6	4	6	96	18	0.1	0.156	0.143	0.005	1039	143	-3428.5	0.212	0.48	0.38	1.5	112	10	299.9	3	0	0	74	1010	7
6	4	6	96	19	-3.4	0.067	-9	-9	-999	44	8.1	0.212	0.48	1	1.3	105	10	299	3	0	0	77	1010	7
6	4	6	96	20	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	98	10	298.6	3	0	0	85	1010	0
6	4	6	96	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	102	10	298.4	3	0	0	88	1011	3
6	4	6	96	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	86	10	297.9	3	0	0	88	1012	3
6	4	6	96	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	297.4	3	0	0	88	1012	3
6	4	6	96	24	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	104	10	297.1	3	0	0	88	1011	3
6	4	7	97	1	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	114	10	297.2	3	0	0	88	1010	7
6	4	7	97	2	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	109	10	297.4	3	0	0	90	1010	0
6	4	7	97	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	108	10	297.2	3	0	0	90	1010	3
6	4	7	97	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	297.1	3	0	0	90	1010	3
6	4	7	97	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	78	10	296.8	3	0	0	90	1011	3
6	4	7	97	6	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	43	10	297.5	3	0	0	90	1012	3
6	4	7	97	7	-1.2	0.049	-9	-9	-999	25	8.7	0.562	0.7	0.48	0.7	73	10	300.4	3	0	0	94	1013	0
6	4	7	97	8	68.1	0.264	0.838	0.005	312	313	-24.5	0.212	0.48	0.25	2.1	106	10	301.9	3	0	0	74	1014	0
6	4	7	97	9	101.3	0.283	1.165	0.005	565	346	-20.3	0.212	0.48	0.19	2.2	113	10	303.4	3	0	0	63	1014	0
6	4	7	97	10	118.9	0.287	1.402	0.007	839	354	-18	0.212	0.48	0.18	2.2	106	10	304	3	0	0	59	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	7	97	11	149.6	0.294	1.608	0.008	1006	367	-15.3	0.212	0.48	0.18	2.2	100	10	304.9	3	0	0	57	1014	6
6	4	7	97	12	166.4	0.288	1.709	0.008	1086	355	-12.9	0.212	0.48	0.18	2.1	102	10	305.5	3	0	0	52	1013	6
6	4	7	97	13	151.6	0.275	1.694	0.008	1159	333	-12.4	0.212	0.48	0.18	2	109	10	305.6	3	0	0	52	1012	7
6	4	7	97	14	124.6	0.261	1.614	0.008	1218	306	-12.8	0.212	0.48	0.18	1.9	100	10	305.4	3	0	0	50	1011	8
6	4	7	97	15	91.4	0.253	1.473	0.008	1262	292	-15.9	0.212	0.48	0.18	1.9	103	10	305	3	0	0	52	1010	8
6	4	7	97	16	47	0.266	1.186	0.007	1282	315	-36.1	0.212	0.48	0.19	2.2	109	10	303.4	3	0	0	59	1010	9
6	4	7	97	17	18.8	0.231	0.875	0.007	1288	256	-59.5	0.212	0.48	0.22	2	111	10	301.9	3	0	0	59	1011	10
6	4	7	97	18	0.1	0.156	0.153	0.007	1284	143	-3434.2	0.212	0.48	0.38	1.5	105	10	299.9	3	0	0	67	1012	7
6	4	7	97	19	-2.9	0.062	-9	-9	-999	40	7.5	0.212	0.48	1	1.2	109	10	298.9	3	0	0	79	1012	7
6	4	7	97	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	106	10	298	3	0	0	82	1012	7
6	4	7	97	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	297.6	3	0	0	85	1013	7
6	4	7	97	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	82	10	297.4	3	0	0	85	1013	7
6	4	7	97	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	69	10	296.9	3	0	0	87	1013	7
6	4	7	97	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	84	10	296.9	3	0	0	90	1012	7
6	4	8	98	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	296.6	3	0	0	97	1011	7
6	4	8	98	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	296.4	3	0	0	97	1011	7
6	4	8	98	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	296.4	3	0	0	97	1010	7
6	4	8	98	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	97	10	295.9	3	0	0	97	1011	7
6	4	8	98	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	101	10	295.5	3	0	0	100	1012	7
6	4	8	98	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	67	10	296.9	3	0	0	93	1012	7
6	4	8	98	7	-2.9	0.076	-9	-9	-999	49	13.8	0.562	0.7	0.48	1.1	74	10	299.6	3	0	0	84	1013	0
6	4	8	98	8	97.1	0.289	0.964	0.005	334	356	-22.4	0.562	0.7	0.25	1.6	79	10	301.8	3	0	0	69	1013	0
6	4	8	98	9	151.2	0.327	1.398	0.005	654	430	-20.9	0.562	0.7	0.19	1.8	84	10	303.4	3	0	0	55	1014	0
6	4	8	98	10	143.9	0.254	1.542	0.005	921	297	-10.3	0.212	0.48	0.18	1.8	89	10	304.5	3	0	0	55	1013	0
6	4	8	98	11	167.4	0.278	1.687	0.005	1038	337	-11.6	0.212	0.48	0.18	2	106	10	305.1	3	0	0	57	1013	4
6	4	8	98	12	169.6	0.278	1.757	0.005	1157	337	-11.5	0.212	0.48	0.18	2	94	10	305.9	3	0	0	48	1012	6
6	4	8	98	13	157.9	0.267	1.77	0.005	1268	317	-10.8	0.212	0.48	0.18	1.9	101	10	306.2	3	0	0	42	1011	7
6	4	8	98	14	102.3	0.274	1.559	0.005	1337	330	-18.1	0.212	0.48	0.18	2.1	96	10	305.4	3	0	0	44	1011	9
6	4	8	98	15	94.4	0.281	1.542	0.006	1403	343	-21.3	0.212	0.48	0.18	2.2	110	10	305.1	3	0	0	42	1010	8
6	4	8	98	16	56.1	0.241	1.308	0.006	1439	273	-22.6	0.212	0.48	0.19	1.9	100	10	304.1	3	0	0	48	1010	9
6	4	8	98	17	16.2	0.22	0.866	0.006	1445	237	-59.1	0.212	0.48	0.23	1.9	94	10	302.4	3	0	0	55	1011	10
6	4	8	98	18	0.1	0.156	0.159	0.006	1438	143	-3434.2	0.212	0.48	0.38	1.5	101	10	299.9	3	0	0	59	1012	7
6	4	8	98	19	-2.4	0.057	-9	-9	-999	38	6.9	0.212	0.48	1	1.1	102	10	298.6	3	0	0	74	1012	7
6	4	8	98	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	298	3	0	0	76	1012	7
6	4	8	98	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	81	10	297.4	3	0	0	74	1013	7
6	4	8	98	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	69	10	296.9	3	0	0	90	1013	7
6	4	8	98	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	296.4	3	0	0	90	1012	7
6	4	8	98	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	296.2	3	0	0	93	1012	7
6	4	9	99	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	109	10	295.6	3	0	0	93	1011	7
6	4	9	99	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	106	10	295.5	3	0	0	93	1011	0
6	4	9	99	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	295.5	3	0	0	87	1010	7
6	4	9	99	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	295.4	3	0	0	87	1011	3
6	4	9	99	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	295.4	3	0	0	93	1012	3
6	4	9	99	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	88	10	296.9	3	0	0	93	1012	3
6	4	9	99	7	-2.9	0.076	-9	-9	-999	49	14.1	0.562	0.7	0.47	1.1	77	10	299.6	3	0	0	90	1012	0
6	4	9	99	8	58.5	0.214	0.821	0.005	341	228	-15.2	0.212	0.48	0.25	1.6	86	10	301.4	3	0	0	77	1013	0
6	4	9	99	9	114.5	0.229	1.313	0.005	715	252	-9.5	0.212	0.48	0.19	1.6	103	10	303.2	3	0	0	63	1013	0
6	4	9	99	10	147	0.265	1.513	0.005	853	313	-11.4	0.212	0.48	0.18	1.9	110	10	304.8	3	0	0	55	1013	0
6	4	9	99	11	145.4	0.264	1.647	0.008	1110	313	-11.5	0.212	0.48	0.18	1.9	106	10	305.4	3	0	0	52	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	9	99	12	148.7	0.275	1.707	0.009	1208	331	-12.6	0.212	0.48	0.18	2	106	10	305.8	3	0	0	52	1011	7
6	4	9	99	13	133.7	0.272	1.687	0.008	1296	326	-13.5	0.212	0.48	0.18	2	114	10	305.5	3	0	0	49	1010	8
6	4	9	99	14	117.1	0.268	1.646	0.009	1373	320	-14.9	0.212	0.48	0.18	2	109	10	305.4	3	0	0	52	1009	8
6	4	9	99	15	34.5	0.194	1.102	0.009	1393	199	-19.1	0.212	0.48	0.18	1.5	131	10	304.2	3	0	0	55	1009	10
6	4	9	99	16	6.8	0.172	0.641	0.009	1395	164	-67.3	0.212	0.48	0.19	1.5	127	10	302.5	3	0	0	59	1009	10
6	4	9	99	17	0.2	0.156	0.19	0.009	1392	142	-1955.2	0.212	0.48	0.23	1.5	113	10	301.2	3	0	0	61	1009	10
6	4	9	99	18	0.1	0.146	0.157	0.009	1390	128	-2790.9	0.212	0.48	0.38	1.4	102	10	299.9	3	0	0	69	1009	3
6	4	9	99	19	-3.8	0.067	-9	-9	-999	42	7.2	0.212	0.48	1	1.3	87	10	298.9	3	0	0	74	1009	3
6	4	9	99	20	-6.9	0.097	-9	-9	-999	70	12.1	0.562	0.7	1	1.4	84	10	298	3	0	0	77	1010	3
6	4	9	99	21	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	81	10	297.5	3	0	0	85	1010	3
6	4	9	99	22	-5.1	0.083	-9	-9	-999	55	10.3	0.562	0.7	1	1.2	78	10	297.2	3	0	0	79	1010	3
6	4	9	99	23	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	76	10	296.9	3	0	0	85	1010	0
6	4	9	99	24	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	76	10	296.4	3	0	0	90	1010	3
6	4	10	100	1	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	74	10	296.1	3	0	0	84	1009	3
6	4	10	100	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	106	10	295.9	3	0	0	84	1009	3
6	4	10	100	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	83	10	295.6	3	0	0	97	1009	3
6	4	10	100	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	295.8	3	0	0	90	1009	3
6	4	10	100	5	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	57	10	295.5	3	0	0	93	1009	0
6	4	10	100	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	66	10	296.4	3	0	0	90	1010	3
6	4	10	100	7	-6.7	0.155	-9	-9	-999	141	50.6	0.562	0.7	0.47	1.5	80	10	299.8	3	0	0	84	1011	0
6	4	10	100	8	71.2	0.246	0.891	0.005	358	281	-19	0.212	0.48	0.25	1.9	86	10	302	3	0	0	74	1012	0
6	4	10	100	9	117.6	0.287	1.32	0.005	706	354	-18.1	0.212	0.48	0.19	2.2	95	10	303.4	3	0	0	63	1012	0
6	4	10	100	10	142.7	0.254	1.576	0.005	991	295	-10.4	0.212	0.48	0.18	1.8	104	10	304.6	3	0	0	55	1012	3
6	4	10	100	11	165	0.249	1.805	0.007	1287	285	-8.4	0.212	0.48	0.18	1.7	104	10	305.9	3	0	0	48	1011	5
6	4	10	100	12	180.4	0.28	1.919	0.007	1414	341	-11	0.212	0.48	0.18	2	88	10	306.6	3	0	0	49	1010	5
6	4	10	100	13	156.7	0.266	1.857	0.006	1472	316	-10.9	0.212	0.48	0.18	1.9	91	10	306.8	3	0	0	49	1009	7
6	4	10	100	14	106.9	0.275	1.649	0.006	1510	332	-17.5	0.212	0.48	0.18	2.1	104	10	305.8	3	0	0	57	1008	8
6	4	10	100	15	65.8	0.283	1.408	0.006	1527	346	-30.8	0.212	0.48	0.18	2.3	97	10	304.4	3	0	0	55	1008	9
6	4	10	100	16	32.3	0.25	1.113	0.006	1535	287	-43.3	0.212	0.48	0.19	2.1	91	10	303.4	3	0	0	59	1008	10
6	4	10	100	17	7.4	0.23	0.68	0.006	1535	254	-148.9	0.212	0.48	0.23	2.1	104	10	301.5	3	0	0	63	1008	10
6	4	10	100	18	0.1	0.146	0.162	0.006	1534	130	-2789.1	0.212	0.48	0.38	1.4	109	10	300	3	0	0	74	1008	7
6	4	10	100	19	-2.9	0.062	-9	-9	-999	39	7.5	0.212	0.48	1	1.2	91	10	299.1	3	0	0	79	1008	7
6	4	10	100	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	298.2	3	0	0	90	1009	7
6	4	10	100	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	297.8	3	0	0	88	1009	7
6	4	10	100	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	94	10	297.4	3	0	0	85	1009	7
6	4	10	100	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	297.1	3	0	0	90	1009	7
6	4	10	100	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	69	10	297	3	0	0	90	1009	7
6	4	11	101	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	32	10	296.5	3	0	0	90	1008	7
6	4	11	101	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	42	10	296.2	3	0	0	94	1008	7
6	4	11	101	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	296	3	0	0	94	1008	7
6	4	11	101	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	79	10	296	3	0	0	94	1008	7
6	4	11	101	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	70	10	295.9	3	0	0	90	1009	0
6	4	11	101	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	85	10	297.1	3	0	0	94	1010	7
6	4	11	101	7	-2	0.062	-9	-9	-999	36	10.7	0.212	0.48	0.47	1.2	98	10	300.2	3	0	0	88	1011	0
6	4	11	101	8	66	0.245	1.13	0.005	789	279	-20.1	0.212	0.48	0.24	1.9	105	10	302.4	3	0	0	74	1012	0
6	4	11	101	9	115	0.286	1.369	0.005	806	353	-18.4	0.212	0.48	0.19	2.2	114	10	304.1	3	0	0	70	1012	0
6	4	11	101	10	143.2	0.264	1.525	0.005	896	312	-11.6	0.212	0.48	0.18	1.9	110	10	305.4	3	0	0	55	1012	4
6	4	11	101	11	151.6	0.265	1.665	0.005	1099	315	-11.1	0.212	0.48	0.18	1.9	103	10	306	3	0	0	55	1011	6
6	4	11	101	12	160.9	0.296	1.8	0.005	1309	371	-14.5	0.212	0.48	0.18	2.2	115	10	306.2	3	0	0	52	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	11	101	13	119	0.287	1.689	0.005	1459	354	-18	0.212	0.48	0.18	2.2	111	10	305.9	3	0	0	49	1009	8
6	4	11	101	14	120.2	0.297	1.74	0.005	1579	372	-19.6	0.212	0.48	0.18	2.3	109	10	305.4	3	0	0	54	1008	8
6	4	11	101	15	61.4	0.281	1.406	0.005	1630	343	-32.5	0.212	0.48	0.18	2.3	118	10	304.4	3	0	0	59	1008	9
6	4	11	101	16	24.8	0.254	1.044	0.005	1649	295	-59.7	0.212	0.48	0.19	2.2	114	10	303.1	3	0	0	59	1008	10
6	4	11	101	17	3.2	0.214	0.527	0.005	1647	228	-277.9	0.212	0.48	0.23	2	110	10	301.6	3	0	0	63	1008	10
6	4	11	101	18	0.1	0.166	0.166	0.005	1643	157	-4149	0.212	0.48	0.38	1.6	107	10	300.2	3	0	0	72	1008	7
6	4	11	101	19	-2.9	0.062	-9	-9	-999	43	7.5	0.212	0.48	1	1.2	104	10	299.2	3	0	0	74	1009	7
6	4	11	101	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	105	10	298.6	3	0	0	79	1009	7
6	4	11	101	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	110	10	298.1	3	0	0	79	1010	3
6	4	11	101	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	102	10	297.9	3	0	0	85	1010	3
6	4	11	101	23	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	102	10	297.8	3	0	0	87	1010	7
6	4	11	101	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	99	10	297.8	3	0	0	85	1010	3
6	4	12	102	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	297.6	3	0	0	85	1009	3
6	4	12	102	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	89	10	297.5	3	0	0	90	1009	3
6	4	12	102	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	297.4	3	0	0	90	1009	7
6	4	12	102	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	56	10	296.9	3	0	0	90	1009	7
6	4	12	102	5	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	102	10	297.4	3	0	0	90	1009	7
6	4	12	102	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	99	10	298.9	3	0	0	90	1010	7
6	4	12	102	7	-4.4	0.127	-9	-9	-999	104	41.9	0.212	0.48	0.46	1.6	105	10	301.4	3	0	0	82	1011	0
6	4	12	102	8	74.5	0.285	0.882	0.005	333	351	-28.2	0.212	0.48	0.24	2.3	123	10	302.8	3	0	0	77	1012	0
6	4	12	102	9	98	0.292	1.159	0.005	574	362	-22.9	0.212	0.48	0.19	2.3	122	10	303.9	3	0	0	65	1012	6
6	4	12	102	10	85	0.288	1.224	0.005	778	356	-25.4	0.212	0.48	0.18	2.3	122	10	304.2	3	0	0	64	1012	9
6	4	12	102	11	165.1	0.315	1.628	0.006	944	407	-17.1	0.212	0.48	0.18	2.4	124	10	306.1	3	0	0	63	1011	5
6	4	12	102	12	132.6	0.328	1.573	0.006	1060	432	-24	0.212	0.48	0.18	2.6	128	10	306.4	3	0	0	56	1010	8
6	4	12	102	13	119.1	0.325	1.551	0.006	1130	426	-26	0.212	0.48	0.18	2.6	134	10	306	3	0	0	54	1009	8
6	4	12	102	14	143.5	0.721	1.691	0.005	1214	1410	-235.2	0.212	0.48	0.18	6.7	95	10	304.9	2	0	0	57	1008	7
6	4	12	102	15	52.3	0.324	1.218	0.005	1243	613	-58.6	0.212	0.48	0.18	2.8	134	10	304	3	0	0	56	1008	10
6	4	12	102	16	35.1	0.298	1.072	0.005	1262	381	-67.7	0.212	0.48	0.19	2.6	138	10	303.2	3	0	0	63	1008	10
6	4	12	102	17	10.5	0.282	0.718	0.005	1266	345	-192	0.212	0.48	0.23	2.6	126	10	302.2	3	0	0	63	1009	10
6	4	12	102	18	0.1	0.208	0.152	0.005	1263	220	-8080.1	0.212	0.48	0.38	2	121	10	300.4	3	0	0	72	1009	7
6	4	12	102	19	-5.1	0.083	-9	-9	-999	66	10	0.212	0.48	1	1.6	111	10	299.5	3	0	0	77	1009	7
6	4	12	102	20	-4.5	0.073	-9	-9	-999	45	7.6	0.212	0.48	1	1.4	101	10	299	3	0	0	85	1009	0
6	4	12	102	21	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	103	10	298.6	3	0	0	82	1010	7
6	4	12	102	22	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	111	10	298.4	3	0	0	82	1010	7
6	4	12	102	23	-3.9	0.067	-9	-9	-999	40	7.1	0.212	0.48	1	1.3	112	10	298.5	3	0	0	88	1010	0
6	4	12	102	24	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	109	10	298.5	3	0	0	88	1009	7
6	4	13	103	1	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	109	10	298.4	3	0	0	88	1009	7
6	4	13	103	2	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	109	10	298.2	3	0	0	94	1008	3
6	4	13	103	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	109	10	298	3	0	0	94	1008	3
6	4	13	103	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	82	10	297.8	3	0	0	88	1008	3
6	4	13	103	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	98	10	297.5	3	0	0	94	1009	0
6	4	13	103	6	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	112	10	299	3	0	0	88	1010	3
6	4	13	103	7	-5.8	0.182	-9	-9	-999	179	93.4	0.212	0.48	0.46	2	122	10	301.4	3	0	0	82	1010	0
6	4	13	103	8	67.8	0.293	0.972	0.005	489	364	-33.3	0.212	0.48	0.24	2.4	131	10	302.9	3	0	0	77	1011	0
6	4	13	103	9	125.4	0.336	1.429	0.005	841	448	-27.3	0.212	0.48	0.19	2.7	116	10	304.1	3	0	0	70	1011	0
6	4	13	103	10	111.8	0.314	1.432	0.005	949	405	-25	0.212	0.48	0.18	2.5	111	10	304.5	3	0	0	59	1011	7
6	4	13	103	11	142.1	0.358	1.623	0.005	1086	493	-29.2	0.212	0.48	0.18	2.9	118	10	304.9	3	0	0	57	1010	7
6	4	13	103	12	162.1	0.353	1.775	0.007	1244	482	-24.3	0.212	0.48	0.18	2.8	123	10	305.8	3	0	0	49	1009	7
6	4	13	103	13	114.3	0.324	1.626	0.007	1354	425	-26.9	0.212	0.48	0.18	2.6	122	10	305.4	3	0	0	45	1008	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	13	103	14	93.3	0.291	1.544	0.007	1420	361	-23.6	0.212	0.48	0.18	2.3	118	10	305.2	3	0	0	49	1007	9
6	4	13	103	15	64.2	0.291	1.371	0.007	1445	362	-34.6	0.212	0.48	0.18	2.4	110	10	304.1	3	0	0	52	1007	9
6	4	13	103	16	48.4	0.304	1.254	0.006	1463	385	-52.1	0.212	0.48	0.19	2.6	118	10	303.4	3	0	0	55	1007	9
6	4	13	103	17	10.2	0.243	0.746	0.006	1465	277	-126.4	0.212	0.48	0.23	2.2	117	10	301.5	3	0	0	57	1007	10
6	4	13	103	18	0.1	0.177	0.16	0.006	1463	172	-4965.6	0.212	0.48	0.38	1.7	112	10	299.9	3	0	0	67	1007	3
6	4	13	103	19	-4.4	0.073	-9	-9	-999	51	7.8	0.212	0.48	1	1.4	111	10	299.1	3	0	0	74	1008	3
6	4	13	103	20	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	111	10	298.5	3	0	0	85	1008	3
6	4	13	103	21	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	106	10	298.4	3	0	0	82	1009	3
6	4	13	103	22	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	102	10	298.1	3	0	0	85	1009	3
6	4	13	103	23	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	104	10	297.8	3	0	0	85	1009	3
6	4	13	103	24	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	102	10	297.5	3	0	0	85	1009	3
6	4	14	104	1	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	74	10	297	3	0	0	90	1008	3
6	4	14	104	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	47	10	296.6	3	0	0	87	1008	0
6	4	14	104	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	296.5	3	0	0	94	1008	3
6	4	14	104	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	80	10	296.4	3	0	0	94	1008	3
6	4	14	104	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	81	10	296.6	3	0	0	97	1008	3
6	4	14	104	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	297.6	3	0	0	94	1009	7
6	4	14	104	7	-2.4	0.08	-9	-9	-999	52	19	0.212	0.48	0.46	1.3	100	10	301	3	0	0	82	1009	0
6	4	14	104	8	78.8	0.268	0.85	0.005	281	319	-21.9	0.212	0.48	0.24	2.1	112	10	302.8	3	0	0	77	1010	0
6	4	14	104	9	95.1	0.254	1.12	0.006	533	294	-15.5	0.212	0.48	0.19	1.9	117	10	303.9	3	0	0	63	1010	6
6	4	14	104	10	116.4	0.249	1.373	0.008	802	286	-12	0.212	0.48	0.18	1.8	117	10	304.9	3	0	0	63	1010	7
6	4	14	104	11	103.7	0.246	1.352	0.008	859	281	-13	0.212	0.48	0.18	1.8	108	10	305.4	3	0	0	57	1010	8
6	4	14	104	12	117.4	0.259	1.443	0.007	923	303	-13.3	0.212	0.48	0.18	1.9	113	10	305.8	3	0	0	56	1009	8
6	4	14	104	13	68.2	0.279	1.22	0.007	958	338	-28.5	0.562	0.7	0.18	1.6	339	10	303.4	3	0	0	50	1008	10
6	4	14	104	14	42.7	0.304	1.052	0.006	980	385	-59.1	0.562	0.7	0.18	1.9	343	10	302	3	0	0	54	1008	10
6	4	14	104	15	34.9	0.238	0.99	0.006	998	268	-34.4	0.562	0.7	0.18	1.4	349	10	301.9	3	0	0	52	1007	10
6	4	14	104	16	14.1	0.134	0.734	0.006	1006	117	-15.3	0.562	0.7	0.19	0.7	45	10	302.2	3	0	0	59	1007	10
6	4	14	104	17	1.7	0.162	0.364	0.006	1006	150	-221.2	0.212	0.48	0.23	1.5	112	10	301.5	3	0	0	61	1007	10
6	4	14	104	18	0.1	0.136	0.141	0.006	1005	115	-2236.6	0.212	0.48	0.38	1.3	93	10	300.2	3	0	0	72	1007	7
6	4	14	104	19	-2.4	0.057	-9	-9	-999	34	6.9	0.212	0.48	1	1.1	103	10	299.1	3	0	0	74	1008	7
6	4	14	104	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	111	10	298.4	3	0	0	79	1009	0
6	4	14	104	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	115	10	298	3	0	0	82	1010	7
6	4	14	104	22	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	106	10	297.8	3	0	0	88	1010	3
6	4	14	104	23	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	89	10	297.4	3	0	0	85	1010	7
6	4	14	104	24	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	297.1	3	0	0	85	1010	7
6	4	15	105	1	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	78	10	296.9	3	0	0	85	1009	7
6	4	15	105	2	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	82	10	296.8	3	0	0	90	1009	0
6	4	15	105	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	106	10	296.5	3	0	0	97	1009	7
6	4	15	105	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	100	10	296.2	3	0	0	97	1009	7
6	4	15	105	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	88	10	296.1	3	0	0	97	1010	7
6	4	15	105	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	64	10	297.5	3	0	0	93	1010	7
6	4	15	105	7	-1.5	0.057	-9	-9	-999	31	11.4	0.212	0.48	0.45	1.1	92	10	300.5	3	0	0	90	1011	0
6	4	15	105	8	80.2	0.221	0.787	0.006	219	239	-12.2	0.212	0.48	0.24	1.6	111	10	302.8	3	0	0	74	1012	0
6	4	15	105	9	127.2	0.212	1.155	0.005	437	225	-6.8	0.212	0.48	0.19	1.4	105	10	304.8	3	0	0	66	1012	0
6	4	15	105	10	159.9	0.165	1.485	0.005	741	154	-2.5	0.212	0.48	0.18	0.9	114	10	306.5	3	0	0	59	1012	0
6	4	15	105	11	89.6	0.261	1.269	0.005	824	306	-17.8	0.562	0.7	0.18	1.4	341	10	304.5	3	0	0	52	1012	9
6	4	15	105	12	54.9	0.273	1.097	0.005	866	327	-33.3	0.562	0.7	0.18	1.6	344	10	303.4	3	0	0	47	1011	10
6	4	15	105	13	56.6	0.298	1.126	0.005	910	374	-42.2	0.562	0.7	0.18	1.8	340	10	303	3	0	0	48	1010	10
6	4	15	105	14	50.5	0.227	1.101	0.005	950	250	-20.8	0.24	0.3	0.16	1.7	329	10	303	3	0	0	49	1009	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	15	105	15	101.8	0.352	1.428	0.005	1030	480	-38.4	0.562	0.7	0.18	2.1	336	10	303.1	3	0	0	52	1009	9
6	4	15	105	16	36.5	0.3	1.023	0.005	1057	380	-66.8	0.562	0.7	0.19	1.9	345	10	302.1	3	0	0	55	1009	10
6	4	15	105	17	2.4	0.125	0.411	0.005	1058	128	-74.6	0.562	0.7	0.22	0.8	44	10	301.9	3	0	0	63	1009	10
6	4	15	105	18	0.1	0.125	0.143	0.005	1056	102	-1770	0.212	0.48	0.38	1.2	96	10	300.9	3	0	0	72	1010	7
6	4	15	105	19	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	84	10	300	3	0	0	74	1011	7
6	4	15	105	20	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	79	10	299	3	0	0	79	1011	7
6	4	15	105	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	78	10	298.4	3	0	0	79	1012	7
6	4	15	105	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	82	10	297.8	3	0	0	79	1013	7
6	4	15	105	23	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	64	10	297.1	3	0	0	79	1012	7
6	4	15	105	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	72	10	296.9	3	0	0	84	1011	7
6	4	16	106	1	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	296.5	3	0	0	90	1011	7
6	4	16	106	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	296.2	3	0	0	90	1010	7
6	4	16	106	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	296.2	3	0	0	93	1011	7
6	4	16	106	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	296	3	0	0	93	1011	7
6	4	16	106	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	102	10	295.9	3	0	0	93	1012	0
6	4	16	106	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	107	10	297.2	3	0	0	93	1013	7
6	4	16	106	7	-1.9	0.069	-9	-9	-999	42	16.3	0.562	0.7	0.45	1	79	10	299.8	3	0	0	90	1014	0
6	4	16	106	8	65	0.197	0.633	0.005	141	201	-10.6	0.212	0.48	0.24	1.4	106	10	302.4	3	0	0	74	1014	0
6	4	16	106	9	103.4	0.217	1.016	0.005	368	232	-8.9	0.212	0.48	0.19	1.5	114	10	304	3	0	0	70	1015	0
6	4	16	106	10	145.9	0.255	1.406	0.005	690	295	-10.2	0.212	0.48	0.18	1.8	112	10	305.4	3	0	0	59	1015	0
6	4	16	106	11	162.5	0.238	1.602	0.005	916	268	-7.5	0.212	0.48	0.18	1.6	113	10	306.9	3	0	0	52	1014	6
6	4	16	106	12	124.9	-9	-9	-9	1044	-999	-99999	0.475	0.6	0.17	0	0	10	306	3	0	0	52	1013	9
6	4	16	106	13	157.6	0.366	1.711	0.005	1148	510	-28.1	0.562	0.7	0.18	2.1	335	10	304	3	0	0	50	1012	8
6	4	16	106	14	165.3	0.38	1.799	0.005	1273	538	-29.9	0.562	0.7	0.18	2.2	341	10	304.2	3	0	0	50	1012	8
6	4	16	106	15	88.9	0.323	1.489	0.005	1341	423	-34.1	0.562	0.7	0.18	1.9	339	10	303.8	3	0	0	52	1012	9
6	4	16	106	16	45	0.18	1.197	0.005	1376	187	-11.7	0.562	0.7	0.19	0.9	352	10	303.8	3	0	0	52	1011	10
6	4	16	106	17	2	0.134	0.424	0.005	1373	113	-107.9	0.212	0.48	0.23	1.2	110	10	302.1	3	0	0	55	1012	10
6	4	16	106	18	0.1	0.136	0.156	0.005	1369	115	-2246.3	0.212	0.48	0.38	1.3	104	10	300.6	3	0	0	72	1012	3
6	4	16	106	19	-2.3	0.052	-9	-9	-999	31	5.6	0.212	0.48	1	1	112	10	299.4	3	0	0	74	1013	3
6	4	16	106	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	116	10	298.5	3	0	0	79	1013	0
6	4	16	106	21	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	83	10	298	3	0	0	79	1013	0
6	4	16	106	22	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	62	10	297.4	3	0	0	85	1014	0
6	4	16	106	23	-2.3	0.052	-9	-9	-999	27	5.5	0.212	0.48	1	1	87	10	297	3	0	0	82	1013	3
6	4	16	106	24	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	100	10	296.6	3	0	0	90	1012	0
6	4	17	107	1	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	81	10	296.4	3	0	0	97	1012	0
6	4	17	107	2	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	94	10	296	3	0	0	97	1012	3
6	4	17	107	3	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	85	10	295.9	3	0	0	93	1012	3
6	4	17	107	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	85	10	295.9	3	0	0	93	1012	3
6	4	17	107	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	295.5	3	0	0	93	1013	0
6	4	17	107	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.2	3	0	0	93	1013	7
6	4	17	107	7	-0.9	0.047	-9	-9	-999	23	10.2	0.212	0.48	0.45	0.9	87	10	300.4	3	0	0	97	1014	0
6	4	17	107	8	77.6	0.21	1.207	0.005	820	222	-10.9	0.212	0.48	0.24	1.5	103	10	302.5	3	0	0	77	1015	0
6	4	17	107	9	116.6	0.268	1.421	0.005	891	319	-15	0.212	0.48	0.19	2	110	10	304.1	3	0	0	62	1014	0
6	4	17	107	10	147.5	0.265	1.587	0.005	981	313	-11.4	0.212	0.48	0.18	1.9	110	10	305.6	3	0	0	48	1014	0
6	4	17	107	11	148.9	0.255	1.64	0.005	1072	297	-10.1	0.212	0.48	0.18	1.8	106	10	306.4	3	0	0	44	1014	7
6	4	17	107	12	158.3	0.257	1.723	0.005	1170	299	-9.7	0.212	0.48	0.18	1.8	99	10	306.9	3	0	0	41	1013	7
6	4	17	107	13	151	0.246	1.892	0.006	1622	280	-8.9	0.212	0.48	0.18	1.7	103	10	307.2	3	0	0	47	1012	7
6	4	17	107	14	96.9	0.235	1.638	0.005	1638	262	-12.1	0.212	0.48	0.18	1.7	108	10	306.5	3	0	0	50	1011	9
6	4	17	107	15	21.2	0.215	0.989	0.005	1641	229	-41.9	0.212	0.48	0.18	1.8	126	10	304.4	3	0	0	50	1011	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	17	107	16	13.1	0.189	0.843	0.005	1643	189	-46.3	0.212	0.48	0.19	1.6	115	10	303.4	3	0	0	56	1011	10
6	4	17	107	17	4.7	0.207	0.6	0.005	1643	217	-169.3	0.212	0.48	0.23	1.9	110	10	301.9	3	0	0	59	1011	10
6	4	17	107	18	0.1	0.156	0.166	0.005	1642	142	-3433.1	0.212	0.48	0.38	1.5	104	10	300.4	3	0	0	67	1011	7
6	4	17	107	19	-3.4	0.067	-9	-9	-999	44	8.1	0.212	0.48	1	1.3	90	10	299.2	3	0	0	74	1011	7
6	4	17	107	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	95	10	298.4	3	0	0	82	1012	7
6	4	17	107	21	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	80	10	297.9	3	0	0	79	1012	7
6	4	17	107	22	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	92	10	297.2	3	0	0	85	1013	7
6	4	17	107	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	118	10	296.9	3	0	0	85	1012	7
6	4	17	107	24	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	100	10	296.4	3	0	0	85	1012	7
6	4	18	108	1	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	123	10	296	3	0	0	85	1011	7
6	4	18	108	2	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	131	10	295.5	3	0	0	90	1010	7
6	4	18	108	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	51	10	295.4	3	0	0	97	1010	7
6	4	18	108	4	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	59	10	295	3	0	0	90	1011	7
6	4	18	108	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	294.9	3	0	0	90	1012	7
6	4	18	108	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	296.4	3	0	0	93	1012	7
6	4	18	108	7	-1	0.052	-9	-9	-999	27	12.1	0.212	0.48	0.44	1	101	10	300.8	3	0	0	90	1013	0
6	4	18	108	8	67.9	0.227	0.752	0.005	226	248	-15.5	0.212	0.48	0.24	1.7	120	10	302.4	3	0	0	77	1013	0
6	4	18	108	9	115.3	0.249	1.392	0.009	846	286	-12.1	0.212	0.48	0.19	1.8	115	10	304.4	3	0	0	63	1013	0
6	4	18	108	10	153.6	0.256	1.623	0.009	1007	298	-9.9	0.212	0.48	0.18	1.8	116	10	305.9	3	0	0	59	1013	0
6	4	18	108	11	147.7	0.236	1.62	0.008	1041	263	-8	0.212	0.48	0.18	1.6	117	10	306.9	3	0	0	52	1013	7
6	4	18	108	12	132.9	0.233	1.577	0.008	1066	259	-8.6	0.212	0.48	0.18	1.6	108	10	306.9	3	0	0	50	1012	8
6	4	18	108	13	53.4	0.197	1.168	0.007	1075	201	-12.9	0.562	0.7	0.18	1	348	10	304	3	0	0	49	1011	10
6	4	18	108	14	56.4	0.311	1.193	0.007	1086	398	-47.9	0.562	0.7	0.18	1.9	340	10	302.8	3	0	0	52	1010	10
6	4	18	108	15	38.9	0.289	1.057	0.007	1093	358	-56.1	0.562	0.7	0.18	1.8	347	10	302.2	3	0	0	47	1009	10
6	4	18	108	16	25.4	0.169	0.918	0.007	1098	166	-17	0.562	0.7	0.19	0.9	356	10	302.4	3	0	0	55	1009	10
6	4	18	108	17	5.1	0.16	0.538	0.007	1099	147	-71.9	0.212	0.48	0.23	1.4	116	10	302.8	3	0	0	55	1009	10
6	4	18	108	18	0.1	0.146	0.145	0.007	1098	128	-2791.8	0.212	0.48	0.38	1.4	113	10	300.9	3	0	0	67	1009	7
6	4	18	108	19	-2.7	0.057	-9	-9	-999	35	6.1	0.212	0.48	1	1.1	108	10	299.5	3	0	0	74	1010	3
6	4	18	108	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	298.8	3	0	0	82	1010	3
6	4	18	108	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	298	3	0	0	82	1011	3
6	4	18	108	22	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	297.5	3	0	0	82	1011	3
6	4	18	108	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	93	10	297.1	3	0	0	88	1011	3
6	4	18	108	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	297	3	0	0	88	1010	3
6	4	19	109	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	296.9	3	0	0	88	1010	3
6	4	19	109	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	296.6	3	0	0	91	1010	3
6	4	19	109	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	296.6	3	0	0	88	1010	3
6	4	19	109	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	85	10	296.4	3	0	0	94	1010	3
6	4	19	109	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	99	10	296.4	3	0	0	90	1010	3
6	4	19	109	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	298.5	3	0	0	94	1011	7
6	4	19	109	7	-2.6	0.149	-9	-9	-999	133	115.8	0.212	0.48	0.44	1.6	113	10	301.4	3	0	0	82	1012	0
6	4	19	109	8	58.5	0.242	0.764	0.005	275	274	-21.9	0.212	0.48	0.24	1.9	119	10	302.8	3	0	0	74	1013	0
6	4	19	109	9	92.5	0.271	1.141	0.005	581	325	-19.5	0.212	0.48	0.19	2.1	132	10	304.4	3	0	0	65	1013	6
6	4	19	109	10	128.5	0.29	1.469	0.009	892	359	-17.1	0.212	0.48	0.18	2.2	134	10	305.4	3	0	0	56	1013	6
6	4	19	109	11	155	0.314	1.63	0.011	1009	404	-17.9	0.212	0.48	0.18	2.4	130	10	306.8	3	0	0	54	1012	6
6	4	19	109	12	120.9	0.307	1.525	0.01	1059	391	-21.5	0.212	0.48	0.18	2.4	126	10	306.8	3	0	0	54	1012	8
6	4	19	109	13	145.3	0.312	1.651	0.009	1119	400	-18.8	0.212	0.48	0.18	2.4	128	10	307.6	3	0	0	51	1011	7
6	4	19	109	14	91.1	0.3	1.429	0.009	1156	377	-26.6	0.212	0.48	0.18	2.4	133	10	306.8	3	0	0	54	1010	9
6	4	19	109	15	68	0.283	1.307	0.008	1184	347	-30.1	0.212	0.48	0.18	2.3	126	10	305.8	3	0	0	54	1010	9
6	4	19	109	16	28.5	0.257	0.981	0.008	1194	299	-53.4	0.212	0.48	0.19	2.2	118	10	304.6	3	0	0	58	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	19	109	17	6.6	0.22	0.604	0.008	1195	237	-143.6	0.212	0.48	0.23	2	117	10	303	3	0	0	63	1010	10
6	4	19	109	18	0.1	0.156	0.149	0.008	1193	143	-3430.8	0.212	0.48	0.38	1.5	109	10	301.4	3	0	0	70	1010	3
6	4	19	109	19	-2.4	0.057	-9	-9	-999	38	6.9	0.212	0.48	1	1.1	105	10	300.4	3	0	0	79	1011	7
6	4	19	109	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	100	10	299.8	3	0	0	85	1011	7
6	4	19	109	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	299.2	3	0	0	82	1012	3
6	4	19	109	22	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	105	10	298.9	3	0	0	88	1013	3
6	4	19	109	23	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	109	10	298.6	3	0	0	91	1012	0
6	4	19	109	24	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	118	10	298.9	3	0	0	94	1012	7
6	4	20	110	1	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	112	10	298.6	3	0	0	94	1011	7
6	4	20	110	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	298	3	0	0	94	1010	3
6	4	20	110	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	95	10	297.9	3	0	0	100	1010	3
6	4	20	110	4	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	109	10	297.9	3	0	0	94	1011	3
6	4	20	110	5	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	104	10	297.9	3	0	0	97	1011	3
6	4	20	110	6	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	107	10	299	3	0	0	94	1012	3
6	4	20	110	7	-2.4	0.163	-9	-9	-999	152	162	0.212	0.48	0.44	1.7	113	10	301.5	3	0	0	94	1013	0
6	4	20	110	8	64.1	0.291	0.583	0.005	112	361	-34.8	0.212	0.48	0.24	2.4	128	10	302.9	3	0	0	82	1013	0
6	4	20	110	9	112.6	0.314	0.988	0.005	310	405	-24.9	0.212	0.48	0.19	2.5	120	10	304.6	3	0	0	70	1013	0
6	4	20	110	10	134.8	0.31	1.269	0.005	549	396	-19.9	0.212	0.48	0.18	2.4	127	10	305.9	3	0	0	59	1013	6
6	4	20	110	11	150.7	0.341	1.504	0.005	817	458	-23.8	0.212	0.48	0.18	2.7	132	10	306.9	3	0	0	52	1013	7
6	4	20	110	12	153.8	0.332	1.656	0.006	1067	440	-21.5	0.212	0.48	0.18	2.6	121	10	306.9	3	0	0	49	1012	7
6	4	20	110	13	128.2	0.327	1.601	0.007	1157	430	-24.6	0.212	0.48	0.18	2.6	110	10	306.4	3	0	0	56	1011	8
6	4	20	110	14	104.1	0.331	1.52	0.007	1217	438	-31.4	0.212	0.48	0.18	2.7	116	10	305.9	3	0	0	58	1010	9
6	4	20	110	15	73.6	0.313	1.369	0.008	1258	403	-37.6	0.212	0.48	0.18	2.6	121	10	305.1	3	0	0	58	1010	9
6	4	20	110	16	39.9	0.291	1.122	0.008	1277	361	-55.5	0.212	0.48	0.19	2.5	113	10	303.9	3	0	0	59	1010	10
6	4	20	110	17	7.8	0.231	0.651	0.008	1278	256	-142.4	0.212	0.48	0.23	2.1	114	10	302.4	3	0	0	61	1010	10
6	4	20	110	18	0.1	0.166	0.153	0.008	1276	157	-4158.7	0.212	0.48	0.38	1.6	108	10	301	3	0	0	67	1011	3
6	4	20	110	19	-3.3	0.062	-9	-9	-999	43	6.7	0.212	0.48	1	1.2	108	10	300	3	0	0	74	1011	3
6	4	20	110	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	101	10	299.6	3	0	0	82	1012	3
6	4	20	110	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	101	10	299.2	3	0	0	88	1012	3
6	4	20	110	22	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	110	10	298.9	3	0	0	88	1013	3
6	4	20	110	23	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	115	10	298.9	3	0	0	88	1013	3
6	4	20	110	24	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	111	10	298.9	3	0	0	82	1012	3
6	4	21	111	1	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	108	10	298.5	3	0	0	82	1012	3
6	4	21	111	2	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	298.2	3	0	0	85	1012	3
6	4	21	111	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	94	10	298	3	0	0	88	1012	3
6	4	21	111	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	297.8	3	0	0	94	1012	3
6	4	21	111	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	93	10	298	3	0	0	91	1013	0
6	4	21	111	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	299	3	0	0	88	1013	7
6	4	21	111	7	-2	0.166	-9	-9	-999	156	211.9	0.212	0.48	0.44	1.7	114	10	301.8	3	0	0	88	1014	0
6	4	21	111	8	56.4	0.251	1.121	0.005	902	289	-25.3	0.212	0.48	0.24	2	118	10	302.9	3	0	0	77	1014	3
6	4	21	111	9	105.2	0.312	1.461	0.005	1072	401	-26.2	0.212	0.48	0.19	2.5	116	10	304.6	3	0	0	61	1014	0
6	4	21	111	10	110.7	0.314	1.55	0.005	1219	404	-25.2	0.212	0.48	0.18	2.5	124	10	305.4	3	0	0	56	1014	7
6	4	21	111	11	130.8	0.318	1.675	0.005	1302	413	-22.3	0.212	0.48	0.18	2.5	123	10	306	3	0	0	56	1014	7
6	4	21	111	12	117.5	0.325	1.646	0.006	1375	426	-26.4	0.212	0.48	0.18	2.6	118	10	305.9	3	0	0	58	1014	8
6	4	21	111	13	99.6	0.321	1.582	0.006	1438	417	-29.9	0.212	0.48	0.18	2.6	106	10	305.8	3	0	0	56	1013	9
6	4	21	111	14	118.8	0.344	1.706	0.005	1513	464	-30.9	0.212	0.48	0.18	2.8	110	10	305.6	3	0	0	52	1012	8
6	4	21	111	15	87.1	0.317	1.56	0.005	1575	411	-33	0.212	0.48	0.18	2.6	115	10	305.4	3	0	0	56	1012	9
6	4	21	111	16	44.3	0.302	1.254	0.005	1607	382	-56.1	0.212	0.48	0.19	2.6	112	10	304.1	3	0	0	55	1012	9
6	4	21	111	17	10.6	0.263	0.78	0.005	1612	310	-153.8	0.212	0.48	0.23	2.4	102	10	302.5	3	0	0	61	1012	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	21	111	18	0.1	0.197	0.165	0.005	1608	203	-6955.2	0.212	0.48	0.38	1.9	105	10	300.9	3	0	0	67	1013	3
6	4	21	111	19	-5.1	0.078	-9	-9	-999	60	8.4	0.212	0.48	1	1.5	106	10	300.1	3	0	0	74	1013	3
6	4	21	111	20	-4.5	0.073	-9	-9	-999	45	7.6	0.212	0.48	1	1.4	98	10	299.8	3	0	0	79	1013	0
6	4	21	111	21	-4.4	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	106	10	299.4	3	0	0	77	1014	3
6	4	21	111	22	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	114	10	298.9	3	0	0	82	1014	3
6	4	21	111	23	-4.4	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	111	10	298.9	3	0	0	79	1013	3
6	4	21	111	24	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	112	10	298.6	3	0	0	79	1013	3
6	4	22	112	1	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	108	10	298.2	3	0	0	82	1012	3
6	4	22	112	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	90	10	297.9	3	0	0	85	1012	0
6	4	22	112	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	91	10	297.1	3	0	0	85	1012	3
6	4	22	112	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	107	10	297	3	0	0	85	1013	3
6	4	22	112	5	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	297.2	3	0	0	85	1013	3
6	4	22	112	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	44	10	298.1	3	0	0	88	1014	7
6	4	22	112	7	-1.9	0.151	-9	-9	-999	135	166	0.562	0.7	0.43	1.2	85	10	300.6	3	0	0	82	1014	0
6	4	22	112	8	57.3	0.232	0.795	0.005	317	258	-19.8	0.212	0.48	0.24	1.8	100	10	302.9	3	0	0	72	1015	0
6	4	22	112	9	106.7	0.322	1.248	0.005	660	421	-28.4	0.212	0.48	0.19	2.6	92	10	303.9	3	0	0	77	1015	4
6	4	22	112	10	113.2	0.314	1.406	0.005	890	405	-24.8	0.212	0.48	0.18	2.5	98	10	304.4	3	0	0	67	1015	7
6	4	22	112	11	127.4	0.317	1.531	0.005	1021	411	-22.7	0.212	0.48	0.18	2.5	109	10	305.1	3	0	0	61	1015	8
6	4	22	112	12	157.7	0.333	1.727	0.007	1183	442	-21.1	0.212	0.48	0.18	2.6	108	10	305.9	3	0	0	59	1014	7
6	4	22	112	13	132.3	0.318	1.689	0.009	1318	414	-22.1	0.212	0.48	0.18	2.5	97	10	305.8	3	0	0	52	1013	8
6	4	22	112	14	95.9	0.31	1.554	0.009	1414	398	-28.1	0.212	0.48	0.18	2.5	97	10	304.6	3	0	0	50	1012	9
6	4	22	112	15	91.3	0.281	1.548	0.008	1467	342	-21.8	0.212	0.48	0.18	2.2	98	10	304.9	3	0	0	52	1012	9
6	4	22	112	16	51.6	0.268	1.284	0.008	1481	319	-33.6	0.212	0.48	0.19	2.2	105	10	304	3	0	0	52	1012	9
6	4	22	112	17	11.8	0.235	0.787	0.008	1483	262	-98.9	0.212	0.48	0.23	2.1	105	10	302.1	3	0	0	57	1012	10
6	4	22	112	18	0.1	0.166	0.16	0.008	1481	157	-4162.8	0.212	0.48	0.38	1.6	86	10	300.5	3	0	0	67	1012	3
6	4	22	112	19	-3.8	0.067	-9	-9	-999	46	7.2	0.212	0.48	1	1.3	88	10	299.4	3	0	0	74	1012	3
6	4	22	112	20	-4.3	0.076	-9	-9	-999	49	9.5	0.562	0.7	1	1.1	84	10	298.6	3	0	0	77	1012	3
6	4	22	112	21	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	77	10	298	3	0	0	79	1013	3
6	4	22	112	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	86	10	297.9	3	0	0	85	1013	3
6	4	22	112	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	88	10	297.8	3	0	0	90	1012	0
6	4	22	112	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	297.1	3	0	0	90	1012	3
6	4	23	113	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	68	10	296.5	3	0	0	84	1011	3
6	4	23	113	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	63	10	296.1	3	0	0	93	1011	3
6	4	23	113	3	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	67	10	295.9	3	0	0	90	1011	3
6	4	23	113	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	83	10	296.5	3	0	0	97	1012	3
6	4	23	113	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	83	10	296.4	3	0	0	97	1012	0
6	4	23	113	6	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	74	10	298	3	0	0	97	1012	7
6	4	23	113	7	-2.1	0.149	-9	-9	-999	132	144.1	0.562	0.7	0.43	1.2	83	10	299.2	3	0	0	97	1013	0
6	4	23	113	8	82	0.212	0.977	0.005	411	224	-10.4	0.212	0.48	0.24	1.5	102	10	302.1	3	0	0	85	1013	0
6	4	23	113	9	125.6	0.28	1.427	0.005	837	340	-15.7	0.212	0.48	0.19	2.1	114	10	304.2	3	0	0	70	1014	0
6	4	23	113	10	144.7	0.284	1.569	0.005	965	347	-14.2	0.212	0.48	0.18	2.1	109	10	305.4	3	0	0	65	1013	4
6	4	23	113	11	150.2	0.304	1.658	0.005	1099	385	-16.8	0.212	0.48	0.18	2.3	105	10	305.9	3	0	0	56	1013	7
6	4	23	113	12	165.5	0.306	1.787	0.005	1246	390	-15.7	0.212	0.48	0.18	2.3	108	10	306.5	3	0	0	49	1012	6
6	4	23	113	13	144.8	0.293	1.766	0.005	1376	365	-15.7	0.212	0.48	0.18	2.2	103	10	306.8	3	0	0	49	1011	7
6	4	23	113	14	112.9	0.305	1.664	0.005	1474	387	-22.6	0.212	0.48	0.18	2.4	106	10	305.9	3	0	0	47	1010	8
6	4	23	113	15	85.5	0.279	1.541	0.005	1544	339	-22.9	0.212	0.48	0.18	2.2	104	10	305.1	3	0	0	45	1010	9
6	4	23	113	16	29.4	0.248	1.083	0.005	1556	284	-46.6	0.212	0.48	0.19	2.1	101	10	303.5	3	0	0	49	1010	10
6	4	23	113	17	6.2	0.19	0.645	0.005	1557	191	-99.8	0.212	0.48	0.23	1.7	105	10	302.1	3	0	0	65	1010	10
6	4	23	113	18	0.1	0.166	0.163	0.005	1555	156	-4158.7	0.212	0.48	0.38	1.6	106	10	301.1	3	0	0	72	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	23	113	19	-4.5	0.078	-9	-9	-999	53	9.4	0.212	0.48	1	1.5	102	10	300.5	3	0	0	74	1011	7
6	4	23	113	20	-5.8	0.088	-9	-9	-999	60	10.7	0.212	0.48	1	1.7	96	10	300	3	0	0	77	1012	7
6	4	23	113	21	-3.9	0.073	-9	-9	-999	45	8.8	0.212	0.48	1	1.4	98	10	298.9	3	0	0	94	1012	7
6	4	23	113	22	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	74	10	298.1	3	0	0	94	1013	7
6	4	23	113	23	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	70	10	297.4	3	0	0	97	1012	7
6	4	23	113	24	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	92	10	297.9	3	0	0	94	1012	7
6	4	24	114	1	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	101	10	297.9	3	0	0	94	1010	7
6	4	24	114	2	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	98	10	297.1	3	0	0	94	1010	7
6	4	24	114	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	116	10	296.9	3	0	0	94	1010	7
6	4	24	114	4	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	124	10	296.9	3	0	1.78	94	1010	7
6	4	24	114	5	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	89	10	296.6	3	0	3.3	97	1012	7
6	4	24	114	6	-2.5	0.069	-9	-9	-999	42	11.9	0.562	0.7	1	1	45	10	296.9	3	0	0.25	94	1012	10
6	4	24	114	7	4.4	0.156	0.143	0.005	24	141	-78.2	0.562	0.7	0.43	1	58	10	296.9	3	0	4.32	94	1013	9
6	4	24	114	8	20.7	0.148	0.55	0.005	290	132	-14.3	0.212	0.48	0.24	1.1	110	10	297.8	3	0	0.51	91	1014	9
6	4	24	114	9	31.4	0.104	0.685	0.005	370	77	-3.2	0.212	0.48	0.19	0.6	122	10	298.4	3	0	0.51	94	1014	10
6	4	24	114	10	66.6	0.158	0.998	0.005	540	144	-5.3	0.212	0.48	0.18	1	110	10	299.8	3	0	0	82	1014	9
6	4	24	114	11	86.9	0.173	1.225	0.005	764	166	-5.4	0.212	0.48	0.18	1.1	113	10	301.4	3	0	0	75	1013	9
6	4	24	114	12	52.8	0.183	1.072	0.005	842	180	-10.5	0.212	0.48	0.18	1.3	104	10	301.6	3	0	0	88	1012	10
6	4	24	114	13	38.4	0.158	0.979	0.005	881	145	-9.3	0.212	0.48	0.18	1.1	91	10	299.4	3	0	1.27	79	1011	10
6	4	24	114	14	59.2	0.212	1.158	0.005	946	225	-14.5	0.562	0.7	0.18	1.1	76	10	301.1	3	0	0	82	1010	10
6	4	24	114	15	24.2	0.141	0.868	0.005	972	123	-10.4	0.212	0.48	0.18	1	87	10	301.4	3	0	0	70	1010	10
6	4	24	114	16	25.5	0.189	0.892	0.005	1000	189	-23.9	0.212	0.48	0.19	1.5	116	10	301.6	3	0	0	63	1009	10
6	4	24	114	17	8.5	0.174	0.621	0.005	1009	167	-55.9	0.212	0.48	0.23	1.5	103	10	301	3	0	0	67	1009	10
6	4	24	114	18	0.1	0.095	0.141	0.005	1006	69	-762.3	0.212	0.48	0.38	0.9	93	10	299.6	3	0	0	74	1010	3
6	4	24	114	19	-1.1	0.036	-9	-9	-999	17	3.9	0.212	0.48	1	0.7	103	10	298.8	3	0	0	77	1010	3
6	4	24	114	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	106	10	298.2	3	0	0	85	1011	3
6	4	24	114	21	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	106	10	297.9	3	0	0	88	1012	3
6	4	24	114	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	100	10	297.5	3	0	0	94	1012	3
6	4	24	114	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	78	10	297.2	3	0	0	90	1012	3
6	4	24	114	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	55	10	296.6	3	0	0	94	1012	3
6	4	25	115	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	296.2	3	0	0	97	1011	3
6	4	25	115	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	296	3	0	0	97	1010	3
6	4	25	115	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	295.8	3	0	0	97	1010	3
6	4	25	115	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	80	10	295.4	3	0	0	97	1010	3
6	4	25	115	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	295.5	3	0	0	93	1011	3
6	4	25	115	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	297.6	3	0	0	93	1012	7
6	4	25	115	7	-0.6	0.106	-9	-9	-999	80	171.6	0.212	0.48	0.43	1.1	106	10	300.5	3	0	0	97	1012	0
6	4	25	115	8	83.7	0.212	1.245	0.006	834	225	-10.3	0.212	0.48	0.24	1.5	109	10	302.5	3	0	0	77	1012	0
6	4	25	115	9	121.1	0.25	1.442	0.006	895	287	-11.6	0.212	0.48	0.19	1.8	108	10	303.9	3	0	0	67	1012	0
6	4	25	115	10	116.4	0.239	1.461	0.007	968	269	-10.6	0.212	0.48	0.18	1.7	118	10	304.9	3	0	0	55	1012	7
6	4	25	115	11	144	0.254	1.624	0.008	1074	295	-10.3	0.212	0.48	0.18	1.8	104	10	305.4	3	0	0	55	1012	7
6	4	25	115	12	169.8	0.288	1.78	0.009	1201	356	-12.7	0.212	0.48	0.18	2.1	103	10	306.2	3	0	0	59	1011	6
6	4	25	115	13	114.5	0.249	1.597	0.009	1285	286	-12.1	0.212	0.48	0.18	1.8	103	10	305.9	3	0	0	59	1010	8
6	4	25	115	14	70.7	0.228	1.379	0.009	1336	250	-15	0.212	0.48	0.18	1.7	126	10	304.9	3	0	0	57	1010	9
6	4	25	115	15	70.3	0.246	1.393	0.01	1386	281	-19.1	0.212	0.48	0.18	1.9	107	10	304.5	3	0	0	55	1009	9
6	4	25	115	16	33.9	0.25	1.095	0.009	1392	288	-41.7	0.212	0.48	0.19	2.1	115	10	303.8	3	0	0	55	1009	10
6	4	25	115	17	3.2	0.185	0.497	0.009	1392	184	-179.1	0.212	0.48	0.23	1.7	108	10	301.6	3	0	0	59	1009	10
6	4	25	115	18	0.1	0.125	0.157	0.009	1391	103	-1769.4	0.212	0.48	0.38	1.2	110	10	300.1	3	0	0	72	1010	7
6	4	25	115	19	-1.6	0.047	-9	-9	-999	26	5.6	0.212	0.48	1	0.9	110	10	299.1	3	0	0	74	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	25	115	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	298.4	3	0	0	79	1010	7
6	4	25	115	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	117	10	297.9	3	0	0	85	1011	7
6	4	25	115	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	95	10	297.5	3	0	0	85	1012	7
6	4	25	115	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	297.2	3	0	0	87	1012	7
6	4	25	115	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	72	10	296.9	3	0	0	90	1011	7
6	4	26	116	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	50	10	296.4	3	0	0	90	1010	7
6	4	26	116	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	50	10	296.1	3	0	0	90	1010	7
6	4	26	116	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	51	10	295.9	3	0	0	90	1010	7
6	4	26	116	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	32	10	295.9	3	0	0	97	1010	7
6	4	26	116	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	295.9	3	0	0	93	1011	7
6	4	26	116	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	296.9	3	0	0	97	1011	7
6	4	26	116	7	-0.8	0.094	-9	-9	-999	66	95.7	0.562	0.7	0.42	0.8	84	10	298.9	3	0	0	85	1012	0
6	4	26	116	8	82.2	0.202	0.845	0.005	265	209	-9	0.212	0.48	0.24	1.4	98	10	302.1	3	0	0	79	1013	0
6	4	26	116	9	102.4	0.226	1.105	0.005	476	248	-10.2	0.212	0.48	0.19	1.6	105	10	303.8	3	0	0	65	1013	5
6	4	26	116	10	135.6	0.272	1.454	0.005	820	327	-13.4	0.212	0.48	0.18	2	110	10	304.8	3	0	0	67	1013	6
6	4	26	116	11	138	0.273	1.558	0.005	990	328	-13.3	0.212	0.48	0.18	2	114	10	305.5	3	0	0	57	1013	7
6	4	26	116	12	144.2	0.274	1.67	0.006	1168	330	-12.9	0.212	0.48	0.18	2	109	10	305.6	3	0	0	59	1012	7
6	4	26	116	13	123.3	0.288	1.651	0.009	1319	356	-17.5	0.212	0.48	0.18	2.2	105	10	305.5	3	0	0	55	1011	8
6	4	26	116	14	74.9	0.267	1.43	0.009	1408	317	-22.8	0.212	0.48	0.18	2.1	112	10	304.4	3	0	0	55	1011	9
6	4	26	116	15	59.3	0.28	1.344	0.009	1477	341	-33.4	0.212	0.48	0.18	2.3	117	10	303.4	3	0	0	55	1010	9
6	4	26	116	16	51.2	0.249	1.306	0.01	1567	286	-27.2	0.212	0.48	0.19	2	112	10	303.2	3	0	0	67	1010	9
6	4	26	116	17	10.3	0.186	0.767	0.01	1577	185	-56.1	0.212	0.48	0.23	1.6	100	10	301.9	3	0	0	65	1010	10
6	4	26	116	18	0.1	0.125	0.164	0.01	1568	103	-1770	0.212	0.48	0.38	1.2	101	10	300	3	0	0	74	1010	7
6	4	26	116	19	-2	0.056	-9	-9	-999	32	7.8	0.562	0.7	1	0.8	81	10	299	3	0	0	79	1010	7
6	4	26	116	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	69	10	298.4	3	0	0	79	1011	7
6	4	26	116	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	80	10	297.6	3	0	0	79	1012	7
6	4	26	116	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	103	10	297	3	0	0	85	1012	7
6	4	26	116	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	297.1	3	0	0	85	1012	7
6	4	26	116	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	76	10	296.9	3	0	0	90	1012	7
6	4	27	117	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	66	10	296.5	3	0	0	97	1011	7
6	4	27	117	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	296.4	3	0	0	90	1010	7
6	4	27	117	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	296.1	3	0	0	97	1010	7
6	4	27	117	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	295.9	3	0	0	97	1010	7
6	4	27	117	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	48	10	295.6	3	0	0	100	1011	0
6	4	27	117	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	297.4	3	0	0	97	1012	7
6	4	27	117	7	-0.1	0.102	-9	-9	-999	75	830.7	0.212	0.48	0.42	1	101	10	300.8	3	0	0	90	1013	0
6	4	27	117	8	85.3	0.222	1.238	0.006	805	241	-11.6	0.212	0.48	0.24	1.6	99	10	302.9	3	0	0	74	1013	0
6	4	27	117	9	139.3	0.224	1.499	0.005	876	245	-7.3	0.212	0.48	0.19	1.5	92	10	304.9	3	0	0	63	1014	0
6	4	27	117	10	161	0.228	1.622	0.005	958	251	-6.7	0.212	0.48	0.18	1.5	104	10	305.8	3	0	0	55	1013	0
6	4	27	117	11	45.6	0.135	1.074	0.005	981	117	-4.8	0.24	0.3	0.16	0.8	331	10	304.4	3	0	0	52	1013	10
6	4	27	117	12	90.5	0.348	1.37	0.005	1025	472	-42	0.562	0.7	0.18	2.1	340	10	302.6	3	0	0	50	1012	10
6	4	27	117	13	157.1	0.415	1.73	0.005	1190	615	-41.1	0.562	0.7	0.18	2.5	340	10	303.2	3	0	0	47	1011	8
6	4	27	117	14	79.2	0.207	1.413	0.005	1285	252	-10.1	0.24	0.3	0.16	1.4	288	10	304.9	3	0	0	52	1011	8
6	4	27	117	15	19	0.171	0.882	0.005	1300	163	-23.6	0.24	0.3	0.16	1.3	324	10	302.5	3	0	0	55	1010	10
6	4	27	117	16	11.9	0.181	0.756	0.005	1310	177	-45.1	0.562	0.7	0.19	1.1	353	10	301.6	3	0	0	55	1010	10
6	4	27	117	17	0.2	0.136	0.184	0.005	1309	116	-1320	0.212	0.48	0.23	1.3	107	10	301.2	3	0	0	61	1010	10
6	4	27	117	18	0.1	0.125	0.154	0.005	1305	102	-1770.6	0.212	0.48	0.38	1.2	100	10	300	3	0	0	72	1010	7
6	4	27	117	19	-1.6	0.047	-9	-9	-999	26	5.6	0.212	0.48	1	0.9	94	10	299.2	3	0	0	74	1011	7
6	4	27	117	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	88	10	298.6	3	0	0	79	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	27	117	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	80	10	298.1	3	0	0	79	1012	7
6	4	27	117	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	297.5	3	0	0	85	1012	7
6	4	27	117	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	297.4	3	0	0	79	1012	7
6	4	27	117	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	297.1	3	0	0	85	1012	7
6	4	28	118	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	89	10	297.2	3	0	0	90	1011	7
6	4	28	118	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	88	10	296.9	3	0	0	85	1010	0
6	4	28	118	3	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	94	10	296.8	3	0	0	90	1010	7
6	4	28	118	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	86	10	296.9	3	0	0	90	1010	7
6	4	28	118	5	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	296.6	3	0	0	85	1011	7
6	4	28	118	6	-5.3	0.09	-9	-9	-999	62	12.6	0.562	0.7	1	1.3	79	10	297.1	3	0	0	90	1012	7
6	4	28	118	7	-0.8	0.175	-9	-9	-999	169	587.9	0.562	0.7	0.42	1.3	85	10	298.4	3	0	0	97	1012	0
6	4	28	118	8	57.3	0.185	-9	-9	-999	183	-9.9	0.212	0.48	0.23	1.3	101	10	300.8	3	0	0	77	1013	4
6	4	28	118	9	113.4	0.293	-9	-9	-999	364	-20	0.562	0.7	0.19	1.6	79	10	303.4	3	0	0	74	1013	7
6	4	28	118	10	74.5	0.229	-9	-9	-999	253	-14.5	0.212	0.48	0.18	1.7	100	10	300.9	3	0	0.25	82	1013	9
6	4	28	118	11	90.3	0.184	-9	-9	-999	182	-6.2	0.212	0.48	0.18	1.2	115	10	302.2	3	0	0	70	1012	9
6	4	28	118	12	75.8	0.257	-9	-9	-999	300	-20.3	0.212	0.48	0.18	2	117	10	299.8	3	0	0	63	1012	9
6	4	28	118	13	70.5	0.218	-9	-9	-999	235	-13.3	0.212	0.48	0.18	1.6	106	10	301.1	3	0	0	63	1011	10
6	4	28	118	14	38.2	0.148	-9	-9	-999	133	-7.7	0.212	0.48	0.18	1	96	10	298.9	3	0	0.25	65	1010	10
6	4	28	118	15	43.3	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	300.4	3	0	0	67	1009	10
6	4	28	118	16	22.4	0.167	-9	-9	-999	156	-18.5	0.562	0.7	0.19	0.9	81	10	300.4	3	0	0	55	1008	10
6	4	28	118	17	4.1	0.139	-9	-9	-999	119	-58.3	0.212	0.48	0.23	1.2	87	10	300.6	3	0	0	74	1008	10
6	4	28	118	18	0.1	0.084	-9	-9	-999	57	-542.4	0.212	0.48	0.38	0.8	95	10	299.9	3	0	0	72	1009	7
6	4	28	118	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	107	10	299.4	3	0	0	77	1009	7
6	4	28	118	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	112	10	298.9	3	0	0	79	1010	7
6	4	28	118	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	298.1	3	0	0	82	1011	3
6	4	28	118	22	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	91	10	298.1	3	0	0	79	1011	3
6	4	28	118	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	297.5	3	0	0	82	1011	3
6	4	28	118	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	297	3	0	0	85	1010	3
6	4	29	119	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	78	10	296.6	3	0	0	85	1009	3
6	4	29	119	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	56	10	296.5	3	0	0	84	1009	0
6	4	29	119	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	48	10	296.1	3	0	0	90	1009	3
6	4	29	119	4	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	39	10	295.9	3	0	0	90	1009	3
6	4	29	119	5	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	34	10	295.8	3	0	0	90	1009	0
6	4	29	119	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	45	10	298	3	0	0	90	1009	7
6	4	29	119	7	27.3	0.153	0.544	0.005	212	137	-11.7	0.212	0.48	0.42	1.1	113	10	301.2	3	0	0	79	1010	0
6	4	29	119	8	68.6	0.265	0.903	0.005	387	313	-24.3	0.212	0.48	0.23	2.1	116	10	302.5	3	0	0	70	1011	0
6	4	29	119	9	113.7	0.277	1.442	0.007	951	335	-16.9	0.212	0.48	0.19	2.1	111	10	303.8	3	0	0	67	1011	0
6	4	29	119	10	140	0.292	1.586	0.007	1029	363	-16.1	0.212	0.48	0.18	2.2	110	10	304.8	3	0	0	59	1011	5
6	4	29	119	11	131.9	0.272	1.591	0.007	1102	326	-13.7	0.212	0.48	0.18	2	117	10	305.2	3	0	0	52	1010	7
6	4	29	119	12	148.7	0.265	1.696	0.007	1185	314	-11.3	0.212	0.48	0.18	1.9	105	10	305.8	3	0	0	45	1010	7
6	4	29	119	13	141.2	0.264	1.704	0.006	1263	311	-11.7	0.212	0.48	0.18	1.9	119	10	305.6	3	0	0	49	1009	8
6	4	29	119	14	93.3	0.224	1.504	0.006	1315	245	-10.9	0.212	0.48	0.18	1.6	111	10	305.4	3	0	0	44	1009	9
6	4	29	119	15	40.3	0.207	1.144	0.006	1335	216	-19.7	0.212	0.48	0.18	1.6	114	10	303.9	3	0	0	45	1008	10
6	4	29	119	16	14.4	0.181	0.813	0.006	1342	177	-36.9	0.212	0.48	0.19	1.5	115	10	303	3	0	0	45	1007	10
6	4	29	119	17	1.8	0.172	0.407	0.006	1341	164	-252.7	0.212	0.48	0.23	1.6	113	10	301.8	3	0	0	51	1007	10
6	4	29	119	18	0.1	0.136	0.155	0.006	1338	115	-2237.4	0.212	0.48	0.38	1.3	104	10	300.2	3	0	0	63	1008	7
6	4	29	119	19	-2.4	0.057	-9	-9	-999	34	6.9	0.212	0.48	1	1.1	97	10	298.9	3	0	0	69	1008	7
6	4	29	119	20	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	84	10	297.8	3	0	0	74	1009	7
6	4	29	119	21	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	82	10	296.9	3	0	0	79	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	4	29	119	22	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	79	10	296.6	3	0	0	84	1010	7
6	4	29	119	23	-4.4	0.076	-9	-9	-999	49	9.2	0.562	0.7	1	1.1	74	10	296.1	3	0	0	90	1010	0
6	4	29	119	24	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	296	3	0	0	90	1009	7
6	4	30	120	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	295.9	3	0	0	90	1009	7
6	4	30	120	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	69	10	295.8	3	0	0	90	1009	7
6	4	30	120	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	295.8	3	0	0	97	1008	3
6	4	30	120	4	-1.5	0.049	-9	-9	-999	25	6.7	0.562	0.7	1	0.7	61	10	295.2	3	0	0	93	1008	7
6	4	30	120	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	295.2	3	0	0	93	1008	0
6	4	30	120	6	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	95	10	297.9	3	0	0	93	1009	7
6	4	30	120	7	26.4	0.133	0.499	0.005	169	111	-8	0.212	0.48	0.41	0.9	103	10	301.4	3	0	0	85	1010	0
6	4	30	120	8	57.6	0.223	0.832	0.005	360	242	-17.3	0.212	0.48	0.23	1.7	114	10	302.1	3	0	0	72	1010	2
6	4	30	120	9	107.9	0.275	1.292	0.007	721	332	-17.4	0.212	0.48	0.19	2.1	119	10	303.9	3	0	0	70	1010	0
6	4	30	120	10	137.4	0.263	1.477	0.007	846	311	-12	0.212	0.48	0.18	1.9	114	10	305.2	3	0	0	59	1010	6
6	4	30	120	11	123.2	0.241	1.461	0.007	913	272	-10.2	0.212	0.48	0.18	1.7	114	10	305.5	3	0	0	52	1010	8
6	4	30	120	12	126.7	0.232	1.512	0.007	983	256	-8.8	0.212	0.48	0.18	1.6	120	10	306.4	3	0	0	50	1010	8
6	4	30	120	13	80.2	0.201	1.318	0.006	1027	208	-9.2	0.212	0.48	0.18	1.4	131	10	305.9	3	0	0	52	1009	9
6	4	30	120	14	83.5	0.284	1.354	0.006	1070	349	-24.7	0.562	0.7	0.18	1.6	341	10	303.6	3	0	0	54	1008	10
6	4	30	120	15	113.2	0.331	1.527	0.005	1132	437	-28.7	0.562	0.7	0.18	1.9	342	10	303.4	3	0	0	56	1008	8
6	4	30	120	16	54.1	0.184	1.204	0.005	1161	194	-10.3	0.562	0.7	0.19	0.9	351	10	303.4	3	0	0	59	1007	10
6	4	30	120	17	7.9	0.183	0.635	0.005	1164	180	-69.7	0.212	0.48	0.23	1.6	107	10	302.8	3	0	0	63	1008	10
6	4	30	120	18	0.1	0.146	0.148	0.005	1162	128	-2788.1	0.212	0.48	0.38	1.4	111	10	301.1	3	0	0	70	1008	7
6	4	30	120	19	-2.4	0.057	-9	-9	-999	35	6.9	0.212	0.48	1	1.1	110	10	299.9	3	0	0	77	1008	7
6	4	30	120	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	104	10	299.1	3	0	0	82	1009	7
6	4	30	120	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	100	10	298.6	3	0	0	88	1010	7
6	4	30	120	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.5	3	0	0	88	1010	7
6	4	30	120	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	74	10	298	3	0	0	91	1010	7
6	4	30	120	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	74	10	297.9	3	0	0	94	1009	7
6	5	1	121	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	50	10	297.5	3	0	0	94	1009	7
6	5	1	121	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	37	10	297	3	0	0	90	1008	7
6	5	1	121	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	59	10	297	3	0	0	94	1008	7
6	5	1	121	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	297.1	3	0	0	94	1008	7
6	5	1	121	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	73	10	296.9	3	0	0	97	1009	7
6	5	1	121	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	298.5	3	0	0	94	1009	7
6	5	1	121	7	22.4	0.159	0.56	0.005	283	146	-16.2	0.212	0.48	0.41	1.2	109	10	301.4	3	0	0	94	1010	0
6	5	1	121	8	80.2	0.24	1.164	0.005	710	271	-15.5	0.212	0.48	0.23	1.8	104	10	303.4	3	0	0	82	1010	0
6	5	1	121	9	106.9	0.237	1.451	0.01	1032	266	-11.2	0.212	0.48	0.19	1.7	115	10	304.9	3	0	0	66	1011	0
6	5	1	121	10	145.2	0.255	1.668	0.01	1154	295	-10.2	0.212	0.48	0.18	1.8	116	10	306.2	3	0	0	58	1011	4
6	5	1	121	11	126.6	0.28	1.618	0.009	1208	341	-15.6	0.212	0.48	0.18	2.1	124	10	306.2	3	0	0	58	1010	8
6	5	1	121	12	84.9	0.222	1.431	0.009	1245	242	-11.6	0.212	0.48	0.18	1.6	121	10	306.2	3	0	0	58	1010	9
6	5	1	121	13	31.9	0.136	1.035	0.008	1250	117	-7	0.212	0.48	0.18	0.9	97	10	304.8	3	0	0	58	1009	10
6	5	1	121	14	25.5	0.255	0.961	0.008	1253	296	-58.5	0.212	0.48	0.18	2.2	127	10	303.9	3	0	0	62	1009	10
6	5	1	121	15	38.6	0.281	1.105	0.008	1257	342	-51.5	0.212	0.48	0.18	2.4	120	10	303.4	3	0	0	60	1008	10
6	5	1	121	16	28.7	0.238	1.002	0.008	1260	268	-42.3	0.212	0.48	0.19	2	122	10	302.1	3	0	0	75	1008	10
6	5	1	121	17	8.6	0.212	0.671	0.008	1260	225	-100.1	0.212	0.48	0.23	1.9	110	10	301.2	3	0	0	74	1008	10
6	5	1	121	18	0.1	0.146	0.152	0.008	1260	129	-2790	0.212	0.48	0.38	1.4	107	10	299.8	3	0	0	82	1009	7
6	5	1	121	19	-3.4	0.067	-9	-9	-999	42	8.1	0.212	0.48	1	1.3	106	10	299	3	0	0	82	1009	7
6	5	1	121	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	298.9	3	0	0	85	1010	7
6	5	1	121	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	66	10	298.4	3	0	0	88	1011	7
6	5	1	121	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	84	10	298.1	3	0	0	88	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	1	121	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	297.9	3	0	0	88	1011	7
6	5	1	121	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	297.9	3	0	0	88	1010	7
6	5	2	122	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	54	10	297.8	3	0	0	88	1010	7
6	5	2	122	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	297.6	3	0	0	85	1009	7
6	5	2	122	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	69	10	297.4	3	0	0	94	1009	7
6	5	2	122	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	66	10	297.4	3	0	0	88	1010	7
6	5	2	122	5	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	89	10	297.5	3	0	0	94	1010	7
6	5	2	122	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	114	10	297.9	3	0	0	94	1011	7
6	5	2	122	7	10	0.179	0.308	0.005	105	173	-51.4	0.562	0.7	0.41	1.1	81	10	299.8	3	0	0	100	1012	0
6	5	2	122	8	35.7	0.176	0.561	0.005	178	170	-13.8	0.212	0.48	0.23	1.3	101	10	300.5	3	0	0.25	97	1012	8
6	5	2	122	9	54.3	0.231	0.756	0.005	286	256	-20.5	0.212	0.48	0.19	1.8	110	10	300.5	3	0	0	94	1012	9
6	5	2	122	10	92.4	0.3	1.065	0.005	472	378	-26.4	0.212	0.48	0.18	2.4	118	10	301	3	0	0	100	1012	8
6	5	2	122	11	122.8	0.288	1.399	0.005	804	356	-17.6	0.212	0.48	0.18	2.2	109	10	301.8	3	0	0	97	1011	8
6	5	2	122	12	138.6	0.32	1.532	0.005	936	416	-21.3	0.212	0.48	0.18	2.5	119	10	303.4	3	0	0	88	1010	8
6	5	2	122	13	126.3	0.28	1.545	0.005	1054	341	-15.6	0.212	0.48	0.18	2.1	116	10	302.6	3	0	0	75	1010	8
6	5	2	122	14	90.1	0.261	1.419	0.005	1144	308	-17.8	0.212	0.48	0.18	2	108	10	304.9	3	0	0	70	1009	9
6	5	2	122	15	46.4	0.256	1.152	0.005	1186	299	-32.7	0.212	0.48	0.18	2.1	111	10	304.1	3	0	0	70	1009	10
6	5	2	122	16	47.1	0.247	1.171	0.005	1230	283	-29	0.212	0.48	0.19	2	113	10	303.8	3	0	0	70	1009	9
6	5	2	122	17	14.9	0.238	0.802	0.005	1241	267	-81	0.212	0.48	0.23	2.1	111	10	302.8	3	0	0	70	1009	10
6	5	2	122	18	0.1	0.187	0.151	0.005	1235	187	-5904.5	0.212	0.48	0.38	1.8	107	10	300.5	3	0	0	82	1010	3
6	5	2	122	19	-3.4	0.067	-9	-9	-999	51	8.1	0.212	0.48	1	1.3	102	10	299.1	3	0	0	88	1010	7
6	5	2	122	20	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	118	10	298.9	3	0	0	94	1012	7
6	5	2	122	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	98	10	298.4	3	0	1.27	94	1012	3
6	5	2	122	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	82	10	298.1	3	0	0	94	1012	7
6	5	2	122	23	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	70	10	297.9	3	0	0	94	1012	7
6	5	2	122	24	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	86	10	297.9	3	0	0	94	1012	7
6	5	3	123	1	-4	0.073	-9	-9	-999	45	8.7	0.212	0.48	1	1.4	130	10	297.9	3	0	0	100	1011	7
6	5	3	123	2	-1.1	0.042	-9	-9	-999	19	6.1	0.212	0.48	1	0.8	100	10	297.8	3	0	0.51	97	1011	10
6	5	3	123	3	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	110	10	297.5	3	0	0	100	1010	7
6	5	3	123	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	297.4	3	0	0	94	1011	7
6	5	3	123	5	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	38	10	296.9	3	0	0	88	1012	7
6	5	3	123	6	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	297.4	3	0	0	94	1012	7
6	5	3	123	7	1.2	0.083	0.105	0.005	34	55	-42.6	0.212	0.48	0.41	0.7	88	10	299.1	3	0	0	88	1012	0
6	5	3	123	8	47.2	0.152	0.671	0.005	231	136	-6.7	0.212	0.48	0.23	1	120	10	301.5	3	0	0	88	1013	7
6	5	3	123	9	112	0.35	1.177	0.005	526	476	-34.5	0.687	0.8	0.19	1.9	142	10	303.1	3	0	0	91	1013	8
6	5	3	123	10	84.7	0.241	1.207	0.005	750	278	-15	0.212	0.48	0.18	1.8	111	10	303.5	3	0	0	80	1013	9
6	5	3	123	11	83.3	0.231	1.258	0.005	864	256	-13.4	0.212	0.48	0.18	1.7	110	10	303.4	3	0	0	65	1013	9
6	5	3	123	12	141.1	0.264	1.578	0.005	1005	311	-11.7	0.212	0.48	0.18	1.9	105	10	305.5	3	0	0	56	1012	7
6	5	3	123	13	129.5	0.281	1.596	0.005	1134	342	-15.4	0.212	0.48	0.18	2.1	104	10	305.9	3	0	0	58	1010	8
6	5	3	123	14	106.9	0.275	1.544	0.005	1239	332	-17.5	0.212	0.48	0.18	2.1	114	10	305.9	3	0	0	59	1009	8
6	5	3	123	15	85.6	0.251	1.465	0.005	1323	290	-16.6	0.212	0.48	0.18	1.9	102	10	305.4	3	0	0	58	1009	9
6	5	3	123	16	44.4	0.246	1.189	0.005	1363	281	-30.3	0.212	0.48	0.19	2	98	10	304.4	3	0	0	65	1009	9
6	5	3	123	17	10.7	0.215	0.74	0.005	1369	229	-83.5	0.212	0.48	0.23	1.9	104	10	302.6	3	0	0	63	1009	10
6	5	3	123	18	0.1	0.156	0.156	0.005	1363	143	-3428.5	0.212	0.48	0.38	1.5	107	10	300.8	3	0	0	70	1010	7
6	5	3	123	19	-4.5	0.078	-9	-9	-999	52	9.4	0.212	0.48	1	1.5	102	10	299.8	3	0	0	77	1010	7
6	5	3	123	20	-3.9	0.067	-9	-9	-999	40	7.1	0.212	0.48	1	1.3	106	10	299.1	3	0	0	85	1011	0
6	5	3	123	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	99	10	298.9	3	0	0	82	1012	7
6	5	3	123	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	107	10	298.2	3	0	0	88	1012	7
6	5	3	123	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	80	10	297.8	3	0	0	88	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	3	123	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	297.2	3	0	0	88	1011	7
6	5	4	124	1	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	97	10	297.1	3	0	0	88	1010	7
6	5	4	124	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	74	10	296.9	3	0	0	90	1010	3
6	5	4	124	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	296.5	3	0	0	92	1009	3
6	5	4	124	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	66	10	296.2	3	0	0	94	1010	3
6	5	4	124	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	71	10	296.1	3	0	0	94	1010	3
6	5	4	124	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	297.9	3	0	0	97	1011	3
6	5	4	124	7	36.9	0.176	0.608	0.005	219	170	-13.4	0.562	0.7	0.41	0.9	79	10	301.1	3	0	0	82	1012	0
6	5	4	124	8	81.6	0.211	1.052	0.005	516	224	-10.5	0.212	0.48	0.23	1.5	111	10	303.1	3	0	0	74	1012	0
6	5	4	124	9	115.7	0.239	1.413	0.007	880	269	-10.7	0.212	0.48	0.19	1.7	115	10	304.8	3	0	0	70	1012	0
6	5	4	124	10	112.2	0.209	1.457	0.008	995	220	-7.4	0.212	0.48	0.18	1.4	124	10	305.4	3	0	0	59	1012	7
6	5	4	124	11	115.9	0.22	1.524	0.01	1103	237	-8.3	0.212	0.48	0.18	1.5	118	10	305.9	3	0	0	61	1011	8
6	5	4	124	12	47.1	0.171	1.14	0.01	1134	164	-9.6	0.212	0.48	0.18	1.2	118	10	305.2	3	0	0	61	1010	10
6	5	4	124	13	39.8	0.216	1.086	0.01	1158	231	-22.8	0.562	0.7	0.18	1.2	345	10	303.5	3	0	0	58	1009	10
6	5	4	124	14	48.9	0.282	1.171	0.009	1182	345	-41.4	0.562	0.7	0.18	1.7	347	10	302.9	3	0	0	58	1009	10
6	5	4	124	15	75.1	0.318	1.359	0.009	1202	412	-38.5	0.562	0.7	0.18	1.9	346	10	302.9	3	0	0	56	1008	9
6	5	4	124	16	36.7	0.264	1.074	0.009	1212	312	-44.8	0.562	0.7	0.19	1.6	347	10	302.5	3	0	0	56	1008	10
6	5	4	124	17	9	-9	-9	-9	1214	-999	-99999	0.475	0.6	0.22	0	0	10	302.4	3	0	0	61	1008	10
6	5	4	124	18	0.1	0.146	0.15	0.009	1213	128	-2790.9	0.212	0.48	0.38	1.4	108	10	301.4	3	0	0	70	1009	7
6	5	4	124	19	-2	0.052	-9	-9	-999	33	6.3	0.212	0.48	1	1	109	10	299.9	3	0	0	77	1010	7
6	5	4	124	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	92	10	299.2	3	0	0	82	1010	7
6	5	4	124	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	97	10	298.5	3	0	0	82	1010	7
6	5	4	124	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	297.9	3	0	0	88	1010	7
6	5	4	124	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	94	10	297.8	3	0	0	88	1010	7
6	5	4	124	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	297.4	3	0	0	88	1010	7
6	5	5	125	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	105	10	297.2	3	0	0	88	1010	7
6	5	5	125	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	107	10	297.1	3	0	0	87	1009	7
6	5	5	125	3	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	297.2	3	0	0	88	1009	7
6	5	5	125	4	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	110	10	297.2	3	0	0	94	1009	7
6	5	5	125	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	69	10	296.9	3	0	0	94	1010	7
6	5	5	125	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	96	10	298.6	3	0	0	94	1011	7
6	5	5	125	7	29.4	0.154	0.919	0.01	951	139	-11.1	0.212	0.48	0.41	1.1	107	10	301.9	3	0	0	88	1011	0
6	5	5	125	8	84.5	0.251	1.325	0.009	995	289	-16.8	0.212	0.48	0.23	1.9	137	10	303.2	3	0	0	77	1012	0
6	5	5	125	9	121.6	0.231	1.516	0.009	1036	255	-9.1	0.212	0.48	0.19	1.6	124	10	304.8	3	0	0	65	1012	0
6	5	5	125	10	139.1	0.224	1.602	0.008	1067	245	-7.3	0.212	0.48	0.18	1.5	131	10	305.9	3	0	0	61	1012	5
6	5	5	125	11	196.1	0.288	1.818	0.006	1108	356	-11	0.687	0.8	0.18	1.3	146	10	306.9	3	0	0	56	1012	7
6	5	5	125	12	142.2	0.205	1.649	0.006	1138	215	-5.4	0.212	0.48	0.18	1.3	127	10	307.4	3	0	0	54	1011	8
6	5	5	125	13	128.9	0.219	1.608	0.005	1164	235	-7.3	0.562	0.7	0.18	1	344	10	306.4	3	0	0	54	1010	9
6	5	5	125	14	51	0.333	1.184	0.005	1172	442	-65.1	0.562	0.7	0.18	2.1	348	10	303.4	3	0	0	54	1009	10
6	5	5	125	15	119.4	0.32	1.583	0.005	1197	416	-24.7	0.562	0.7	0.18	1.8	345	10	304.2	3	0	0	56	1009	8
6	5	5	125	16	49.1	0.155	1.181	0.005	1208	159	-6.8	0.562	0.7	0.19	0.7	36	10	304.4	3	0	0	59	1009	10
6	5	5	125	17	2.2	0.193	0.418	0.005	1207	194	-295.3	0.212	0.48	0.23	1.8	109	10	302.5	3	0	0	59	1009	10
6	5	5	125	18	0.1	0.166	0.15	0.005	1205	156	-4155.9	0.212	0.48	0.38	1.6	104	10	300.9	3	0	0	67	1010	3
6	5	5	125	19	-3.3	0.062	-9	-9	-999	43	6.7	0.212	0.48	1	1.2	105	10	299.9	3	0	0	77	1011	3
6	5	5	125	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	100	10	299	3	0	0	82	1011	3
6	5	5	125	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	100	10	298.4	3	0	0	82	1012	3
6	5	5	125	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	298	3	0	0	88	1012	3
6	5	5	125	23	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	102	10	297.6	3	0	0	88	1011	3
6	5	5	125	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	297.4	3	0	0	88	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	6	126	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	297.1	3	0	0	88	1010	3
6	5	6	126	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	296.8	3	0	0	90	1010	3
6	5	6	126	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	79	10	296.4	3	0	0	94	1010	3
6	5	6	126	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	74	10	296.2	3	0	0	94	1010	3
6	5	6	126	5	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	125	10	296	3	0	0	97	1011	3
6	5	6	126	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	82	10	298.8	3	0	0	97	1012	7
6	5	6	126	7	29.5	0.154	0.782	0.005	584	139	-11.1	0.212	0.48	0.41	1.1	110	10	301.8	3	0	0	88	1013	0
6	5	6	126	8	57	0.242	1.017	0.005	667	273	-22.4	0.212	0.48	0.23	1.9	124	10	302.2	3	0	0	77	1013	5
6	5	6	126	9	93.8	0.262	1.276	0.005	801	309	-17.4	0.212	0.48	0.19	2	124	10	303.9	3	0	0	65	1013	6
6	5	6	126	10	147.7	0.294	1.53	0.005	876	366	-15.5	0.212	0.48	0.18	2.2	125	10	305.9	3	0	0	59	1013	0
6	5	6	126	11	135.3	0.291	1.544	0.007	984	361	-16.5	0.212	0.48	0.18	2.2	132	10	305.9	3	0	0	52	1012	7
6	5	6	126	12	140.2	0.283	1.64	0.008	1137	346	-14.5	0.212	0.48	0.18	2.1	129	10	306.5	3	0	0	52	1012	7
6	5	6	126	13	140.4	0.263	1.712	0.008	1291	311	-11.7	0.212	0.48	0.18	1.9	119	10	306.9	3	0	0	50	1010	8
6	5	6	126	14	128.5	0.261	1.685	0.008	1344	307	-12.5	0.212	0.48	0.18	1.9	114	10	307	3	0	0	52	1010	8
6	5	6	126	15	27.2	0.219	1.007	0.008	1348	235	-34.5	0.212	0.48	0.18	1.8	115	10	304.5	3	0	0	52	1009	10
6	5	6	126	16	11.7	0.216	0.76	0.007	1350	231	-77.2	0.212	0.48	0.19	1.9	115	10	303.5	3	0	0	52	1009	10
6	5	6	126	17	12.3	0.216	0.773	0.007	1353	231	-74.1	0.212	0.48	0.23	1.9	117	10	303.1	3	0	0	59	1009	10
6	5	6	126	18	0.1	0.156	0.156	0.007	1351	143	-3428.5	0.212	0.48	0.38	1.5	104	10	301	3	0	0	67	1010	3
6	5	6	126	19	-3.3	0.062	-9	-9	-999	40	6.7	0.212	0.48	1	1.2	102	10	299.9	3	0	0	77	1010	3
6	5	6	126	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	299.1	3	0	0	82	1011	3
6	5	6	126	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	81	10	298.5	3	0	0	82	1012	3
6	5	6	126	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	114	10	298	3	0	0	85	1012	3
6	5	6	126	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	65	10	297.9	3	0	0	88	1012	3
6	5	6	126	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	59	10	297.4	3	0	0	94	1012	3
6	5	7	127	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	62	10	297.2	3	0	0	94	1011	3
6	5	7	127	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	71	10	297.4	3	0	0	91	1010	3
6	5	7	127	3	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	297.6	3	0	0	94	1010	3
6	5	7	127	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	297.1	3	0	0	94	1011	3
6	5	7	127	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	68	10	296.9	3	0	0	91	1011	3
6	5	7	127	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	298.8	3	0	0	88	1012	3
6	5	7	127	7	29.7	0.173	0.716	0.005	447	166	-15.8	0.212	0.48	0.4	1.3	108	10	301.9	3	0	0	88	1013	0
6	5	7	127	8	53.1	0.25	0.923	0.005	535	287	-26.5	0.212	0.48	0.23	2	126	10	302.5	3	0	0	79	1013	6
6	5	7	127	9	88	0.261	1.184	0.005	681	306	-18.2	0.212	0.48	0.19	2	126	10	303.9	3	0	0	70	1013	7
6	5	7	127	10	129.7	0.29	1.457	0.005	862	359	-17	0.212	0.48	0.18	2.2	128	10	304.8	3	0	0	65	1013	6
6	5	7	127	11	120.3	0.269	1.489	0.005	993	321	-14.6	0.212	0.48	0.18	2	121	10	305.8	3	0	0	72	1012	8
6	5	7	127	12	97.9	0.273	1.438	0.005	1098	328	-18.7	0.212	0.48	0.18	2.1	117	10	305.4	3	0	0	61	1012	9
6	5	7	127	13	120.4	0.288	1.601	0.005	1229	355	-17.8	0.212	0.48	0.18	2.2	115	10	305.9	3	0	0	56	1010	8
6	5	7	127	14	70.6	0.275	1.367	0.005	1303	332	-26.5	0.212	0.48	0.18	2.2	113	10	304.8	3	0	0	57	1009	9
6	5	7	127	15	58.5	0.261	1.304	0.005	1366	307	-27.5	0.212	0.48	0.18	2.1	119	10	304.5	3	0	0	56	1009	10
6	5	7	127	16	17.5	0.24	0.875	0.005	1381	270	-71	0.212	0.48	0.19	2.1	109	10	303.4	3	0	0	63	1009	10
6	5	7	127	17	4.8	0.217	0.568	0.005	1382	232	-192.7	0.212	0.48	0.23	2	114	10	302	3	0	0	59	1009	10
6	5	7	127	18	0.1	0.146	0.157	0.005	1378	129	-2793.7	0.212	0.48	0.38	1.4	106	10	300.6	3	0	0	67	1010	7
6	5	7	127	19	-2.4	0.057	-9	-9	-999	35	6.9	0.212	0.48	1	1.1	109	10	299.5	3	0	0	74	1010	7
6	5	7	127	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	105	10	298.8	3	0	0	79	1012	7
6	5	7	127	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	107	10	298	3	0	0	79	1012	7
6	5	7	127	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	297.8	3	0	0	85	1012	7
6	5	7	127	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	79	10	297.2	3	0	0	90	1012	7
6	5	7	127	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	72	10	296.5	3	0	0	90	1011	7
6	5	8	128	1	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	77	10	296.4	3	0	0	90	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	8	128	2	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	77	10	296.1	3	0	0	87	1009	7
6	5	8	128	3	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	64	10	295.9	3	0	0	90	1009	7
6	5	8	128	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	118	10	295.4	3	0	0	87	1010	7
6	5	8	128	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	295.4	3	0	0	90	1010	0
6	5	8	128	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	58	10	297.6	3	0	0	93	1011	7
6	5	8	128	7	41.4	0.165	0.868	0.006	570	154	-9.8	0.562	0.7	0.4	0.8	78	10	300.8	3	0	0	79	1012	0
6	5	8	128	8	77.3	0.21	1.119	0.007	654	222	-10.9	0.212	0.48	0.23	1.5	94	10	302.8	3	0	0	72	1012	0
6	5	8	128	9	108.3	0.247	1.337	0.008	798	283	-12.6	0.212	0.48	0.19	1.8	130	10	304.2	3	0	0	70	1012	2
6	5	8	128	10	106.2	0.217	1.37	0.007	874	233	-8.7	0.212	0.48	0.18	1.5	136	10	305.1	3	0	0	63	1012	8
6	5	8	128	11	147.5	0.127	1.588	0.005	981	107	-1.3	0.212	0.48	0.18	0.6	106	10	306.4	3	0	0	59	1011	7
6	5	8	128	12	156.3	0.303	1.662	0.005	1060	385	-16.1	0.562	0.7	0.18	1.6	341	10	304.9	3	0	0	58	1010	8
6	5	8	128	13	106.2	0.39	1.476	0.005	1092	561	-50.4	0.562	0.7	0.18	2.4	339	10	303.6	3	0	0	56	1010	9
6	5	8	128	14	93.2	0.3	1.426	0.005	1122	381	-26	0.562	0.7	0.18	1.7	340	10	304.1	3	0	0	52	1009	9
6	5	8	128	15	36.8	0.152	1.051	0.005	1133	150	-8.6	0.24	0.3	0.16	1	312	10	304.1	3	0	0	50	1009	10
6	5	8	128	16	48.5	0.195	1.157	0.005	1148	198	-13.7	0.562	0.7	0.19	1	337	10	303.4	3	0	0	56	1008	10
6	5	8	128	17	22.8	0.141	0.902	0.005	1155	123	-11.1	0.562	0.7	0.23	0.7	23	10	303.2	3	0	0	57	1009	10
6	5	8	128	18	0.1	0.156	0.148	0.005	1153	142	-3427.4	0.212	0.48	0.38	1.5	110	10	301.4	3	0	0	70	1009	7
6	5	8	128	19	-5.1	0.083	-9	-9	-999	56	10	0.212	0.48	1	1.6	86	10	300.4	3	0	0	77	1010	7
6	5	8	128	20	-7.3	0.099	-9	-9	-999	71	11.9	0.212	0.48	1	1.9	87	10	299.9	3	0	0	85	1012	7
6	5	8	128	21	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	86	10	299.4	3	0	0	77	1012	7
6	5	8	128	22	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	98	10	299.1	3	0	0	77	1012	7
6	5	8	128	23	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	110	10	298.8	3	0	0	85	1012	7
6	5	8	128	24	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	100	10	298.4	3	0	0	82	1011	7
6	5	9	129	1	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	101	10	298.2	3	0	0	88	1010	7
6	5	9	129	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	112	10	298.2	3	0	0	88	1009	7
6	5	9	129	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	119	10	298	3	0	0	88	1009	7
6	5	9	129	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	93	10	297.8	3	0	0	94	1009	7
6	5	9	129	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	86	10	297.5	3	0	0	94	1009	0
6	5	9	129	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	68	10	299.4	3	0	0	88	1010	7
6	5	9	129	7	27.6	0.162	-9	-9	-999	151	-14	0.212	0.48	0.4	1.2	104	10	301.8	3	0	0	82	1011	0
6	5	9	129	8	74.8	0.22	-9	-9	-999	237	-12.7	0.212	0.48	0.23	1.6	100	10	303.4	3	0	0	75	1011	0
6	5	9	129	9	70.6	0.208	-9	-9	-999	219	-11.6	0.212	0.48	0.19	1.5	120	10	304.1	3	0	0	65	1012	8
6	5	9	129	10	94.2	0.244	-9	-9	-999	277	-13.9	0.212	0.48	0.18	1.8	122	10	304.9	3	0	0	61	1011	8
6	5	9	129	11	94.7	0.235	-9	-9	-999	261	-12.3	0.212	0.48	0.18	1.7	114	10	305.2	3	0	0	52	1011	9
6	5	9	129	12	120.4	0.148	-9	-9	-999	133	-2.4	0.212	0.48	0.18	0.8	94	10	305.9	3	0	0	50	1010	8
6	5	9	129	13	58.4	0.224	-9	-9	-999	244	-17.4	0.562	0.7	0.18	1.2	359	10	303	3	0	0	51	1010	10
6	5	9	129	14	51.1	0.221	-9	-9	-999	239	-19.1	0.562	0.7	0.18	1.2	2	10	303.5	3	0	0	58	1009	10
6	5	9	129	15	98.7	0.238	-9	-9	-999	267	-12.3	0.562	0.7	0.18	1.2	1	10	304.4	3	0	0	61	1008	9
6	5	9	129	16	12.9	0.198	-9	-9	-999	203	-54.1	0.212	0.48	0.19	1.7	106	10	303	3	0	0	59	1008	10
6	5	9	129	17	7.7	0.263	-9	-9	-999	311	-214.7	0.562	0.7	0.23	1.8	80	10	301.8	3	0	0	65	1009	10
6	5	9	129	18	0.1	0.166	-9	-9	-999	159	-4154.5	0.212	0.48	0.38	1.6	86	10	300.2	3	0	0	67	1010	7
6	5	9	129	19	-3.4	0.067	-9	-9	-999	46	8.1	0.212	0.48	1	1.3	97	10	299.1	3	0	0	69	1011	7
6	5	9	129	20	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	101	10	298.5	3	0	0	74	1011	7
6	5	9	129	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	101	10	298.1	3	0	0	74	1012	7
6	5	9	129	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	98	10	297.8	3	0	0	85	1012	7
6	5	9	129	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	297.5	3	0	0	85	1012	7
6	5	9	129	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	297	3	0	0	88	1011	3
6	5	10	130	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	297	3	0	0	88	1010	3
6	5	10	130	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	108	10	297.2	3	0	0	88	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	10	130	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	54	10	296.6	3	0	0	94	1010	3
6	5	10	130	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	52	10	296.4	3	0	0	90	1010	3
6	5	10	130	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	54	10	296.1	3	0	0	93	1011	3
6	5	10	130	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	71	10	298.5	3	0	0	94	1012	3
6	5	10	130	7	26.7	0.152	0.798	0.006	686	137	-12	0.212	0.48	0.4	1.1	107	10	301.9	3	0	0	82	1012	0
6	5	10	130	8	62.2	0.225	1.089	0.006	750	245	-16.5	0.212	0.48	0.23	1.7	123	10	303	3	0	0	74	1013	0
6	5	10	130	9	118.8	0.23	1.423	0.006	877	254	-9.2	0.212	0.48	0.19	1.6	121	10	304.9	3	0	0	61	1013	0
6	5	10	130	10	137.9	0.224	1.542	0.006	961	244	-7.4	0.212	0.48	0.18	1.5	123	10	306.2	3	0	0	999	1013	6
6	5	10	130	11	75.7	0.2	1.283	0.006	1008	206	-9.6	0.212	0.48	0.18	1.4	125	10	305.9	3	0	0	999	1012	9
6	5	10	130	12	44.1	0.193	1.081	0.006	1033	195	-14.6	0.562	0.7	0.18	1	353	10	304.4	3	0	0	999	1011	10
6	5	10	130	13	60.8	0.263	1.217	0.006	1070	310	-27	0.562	0.7	0.18	1.5	342	10	303.8	3	0	0	999	1010	10
6	5	10	130	14	43.3	0.28	1.096	0.006	1096	340	-45.4	0.562	0.7	0.18	1.7	347	10	303.1	3	0	0	999	1009	10
6	5	10	130	15	50.6	0.246	1.165	0.006	1126	281	-26.6	0.562	0.7	0.18	1.4	344	10	302.9	3	0	0	999	1009	10
6	5	10	130	16	23.6	0.121	0.908	0.006	1142	105	-6.8	0.212	0.48	0.19	0.8	109	10	303.9	3	0	0	999	1009	10
6	5	10	130	17	2.1	0.183	0.407	0.006	1141	179	-257.3	0.212	0.48	0.23	1.7	104	10	302.4	3	0	0	999	1009	10
6	5	10	130	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.38	1.5	102	10	300.9	3	0	0	999	1010	99
6	5	10	130	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.3	103	10	299.8	3	0	0	999	1011	99
6	5	10	130	20	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	86	10	299.4	3	0	0	79	1012	3
6	5	10	130	21	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	91	10	298.9	3	0	0	82	1012	7
6	5	10	130	22	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	102	10	298.5	3	0	0	82	1012	7
6	5	10	130	23	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	109	10	298.8	3	0	0	85	1012	3
6	5	10	130	24	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	110	10	298.8	3	0	0	88	1011	3
6	5	11	131	1	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	119	10	298.9	3	0	0	88	1010	3
6	5	11	131	2	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	107	10	298.8	3	0	0	91	1010	3
6	5	11	131	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	100	10	298.4	3	0	0	88	1010	3
6	5	11	131	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	79	10	297.5	3	0	0	88	1010	7
6	5	11	131	5	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	91	10	297.4	3	0	0	94	1011	7
6	5	11	131	6	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	123	10	298.9	3	0	0	94	1012	7
6	5	11	131	7	10	0.148	0.323	0.005	122	131	-29.5	0.212	0.48	0.4	1.2	132	10	300.9	3	0	0	87	1013	0
6	5	11	131	8	62	0.253	0.746	0.005	242	292	-23.5	0.212	0.48	0.23	2	132	10	302.8	3	0	0	81	1013	0
6	5	11	131	9	82.4	0.25	0.971	0.005	402	288	-17.1	0.212	0.48	0.19	1.9	136	10	304.4	3	0	0	75	1013	7
6	5	11	131	10	102.5	0.347	1.194	0.005	601	470	-36.8	0.687	0.8	0.18	1.9	144	10	304.8	3	0	0	70	1013	9
6	5	11	131	11	142.2	0.345	1.512	0.005	879	467	-26.1	0.687	0.8	0.18	1.8	145	10	305.5	3	0	0	999	1012	9
6	5	11	131	12	123.6	0.26	1.566	0.005	1123	308	-12.9	0.212	0.48	0.18	1.9	134	10	306.2	3	0	0	999	1011	8
6	5	11	131	13	128.5	0.329	1.651	0.005	1265	433	-24.9	0.687	0.8	0.18	1.7	145	10	306.2	3	0	0	999	1010	9
6	5	11	131	14	43.6	0.205	1.16	0.005	1292	221	-17.8	0.562	0.7	0.18	1.1	357	10	303.5	3	0	0	999	1010	10
6	5	11	131	15	35.4	0.275	1.09	0.005	1316	332	-52.9	0.562	0.7	0.18	1.7	352	10	302.8	3	0	0	999	1009	10
6	5	11	131	16	5.6	0.109	0.591	0.005	1316	106	-20.8	0.562	0.7	0.19	0.6	344	10	300.5	3	0	9.14	999	1009	10
6	5	11	131	17	1.2	0.112	0.352	0.005	1317	86	-104.9	0.212	0.48	0.23	1	118	10	300.4	3	0	0.25	67	1009	10
6	5	11	131	18	0.1	0.166	0.154	0.005	1316	156	-4154.5	0.212	0.48	0.38	1.6	113	10	300.1	3	0	0	74	1010	7
6	5	11	131	19	-2.4	0.057	-9	-9	-999	40	6.9	0.212	0.48	1	1.1	115	10	299.8	3	0	0	74	1010	7
6	5	11	131	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	107	10	299.5	3	0	0	79	1012	7
6	5	11	131	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	105	10	299.4	3	0	0	82	1012	7
6	5	11	131	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	82	10	299.2	3	0	0	82	1012	7
6	5	11	131	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	298.9	3	0	0	82	1012	7
6	5	11	131	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	109	10	298.9	3	0	0	82	1012	7
6	5	12	132	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	298.6	3	0	0	88	1010	7
6	5	12	132	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	63	10	298.1	3	0	0	91	1010	7
6	5	12	132	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	298	3	0	0	88	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	12	132	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	64	10	297.8	3	0	0	82	1010	7
6	5	12	132	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	93	10	297.8	3	0	0	88	1011	7
6	5	12	132	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	298.9	3	0	0	94	1011	7
6	5	12	132	7	9.8	0.157	0.355	0.005	164	144	-35.8	0.212	0.48	0.4	1.3	123	10	300.4	3	0	0	88	1012	7
6	5	12	132	8	37.9	0.224	0.696	0.005	321	245	-27	0.212	0.48	0.23	1.8	133	10	301.9	3	0	0	85	1012	8
6	5	12	132	9	43.5	0.208	0.843	0.005	498	218	-18.7	0.212	0.48	0.19	1.6	128	10	302.6	3	0	0	79	1013	9
6	5	12	132	10	48.8	0.201	0.969	0.005	674	207	-15	0.212	0.48	0.18	1.5	126	10	303.1	3	0	0	65	1013	10
6	5	12	132	11	44.6	0.199	1	0.005	809	205	-16	0.212	0.48	0.18	1.5	111	10	303.4	3	0	0	68	1013	10
6	5	12	132	12	43	0.208	1.013	0.005	873	218	-18.8	0.212	0.48	0.18	1.6	93	10	303.1	3	0	0	65	1012	10
6	5	12	132	13	37.1	0.167	0.985	0.005	928	157	-11.3	0.212	0.48	0.18	1.2	98	10	303.2	3	0	0	65	1011	10
6	5	12	132	14	17.8	0.137	0.778	0.005	953	117	-13.1	0.562	0.7	0.18	0.7	346	10	301.8	3	0	0	68	1010	10
6	5	12	132	15	11.7	0.118	0.68	0.005	969	94	-12.8	0.562	0.7	0.18	0.6	344	10	301	3	0	0	70	1010	10
6	5	12	132	16	7.1	-9	-9	-9	980	-999	-99999	0.475	0.6	0.18	0	0	10	301	3	0	0	70	1010	10
6	5	12	132	17	1.6	0.094	0.351	0.005	982	66	-47.6	0.212	0.48	0.23	0.8	114	10	301.2	3	0	0	74	1011	10
6	5	12	132	18	0.1	0.115	0.14	0.005	981	90	-1372.1	0.212	0.48	0.38	1.1	125	10	300.9	3	0	0	79	1012	7
6	5	12	132	19	-1.3	0.042	-9	-9	-999	22	5	0.212	0.48	1	0.8	118	10	300.4	3	0	0	82	1013	7
6	5	12	132	20	-0.6	0.031	-9	-9	-999	13	4.6	0.212	0.48	1	0.6	103	10	300	3	0	0	88	1013	10
6	5	12	132	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	299.6	3	0	0	82	1014	7
6	5	12	132	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	65	10	299.2	3	0	0	82	1014	7
6	5	12	132	23	-0.9	0.042	-9	-9	-999	20	7.2	0.562	0.7	1	0.6	80	10	299	3	0	0	88	1014	10
6	5	12	132	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	298.9	3	0	0	88	1013	7
6	5	13	133	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	298.6	3	0	0	94	1012	7
6	5	13	133	2	-0.9	0.042	-9	-9	-999	20	7.1	0.562	0.7	1	0.6	68	10	298.4	3	0	0	94	1011	10
6	5	13	133	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	46	10	298.1	3	0	0	88	1012	7
6	5	13	133	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	35	10	298	3	0	0	94	1012	7
6	5	13	133	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	52	10	297.9	3	0	0	94	1012	7
6	5	13	133	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	58	10	298.6	3	0	0	94	1013	7
6	5	13	133	7	8.7	0.109	0.349	0.005	176	83	-13.4	0.212	0.48	0.4	0.8	100	10	300.4	3	0	0	94	1013	7
6	5	13	133	8	18.2	0.147	0.481	0.005	220	129	-15.6	0.212	0.48	0.23	1.1	113	10	301	3	0	0	85	1013	10
6	5	13	133	9	65.3	0.216	0.881	0.005	378	232	-14	0.212	0.48	0.19	1.6	115	10	302	3	0	0	80	1014	9
6	5	13	133	10	124.9	0.261	1.332	0.005	685	306	-12.8	0.212	0.48	0.18	1.9	112	10	304	3	0	0	70	1014	7
6	5	13	133	11	91.5	0.236	1.309	0.006	887	264	-13	0.687	0.8	0.18	1.1	140	10	303.2	3	0	0.51	70	1013	9
6	5	13	133	12	19.1	0.24	0.78	0.006	897	271	-65.3	0.687	0.8	0.18	1.4	186	10	301.6	3	0	0	56	1013	10
6	5	13	133	13	20.6	0.241	0.803	0.006	908	273	-61.8	0.687	0.8	0.18	1.4	165	10	300.6	3	0	0	58	1012	10
6	5	13	133	14	31.2	0.115	0.929	0.006	926	98	-4.4	0.212	0.48	0.18	0.7	112	10	300.1	3	0	0.76	75	1012	10
6	5	13	133	15	43.6	0.13	1.048	0.005	952	108	-4.6	0.212	0.48	0.18	0.8	119	10	301.4	3	0	0	79	1011	10
6	5	13	133	16	31.4	0.155	0.946	0.005	970	140	-10.6	0.212	0.48	0.19	1.1	117	10	301.6	3	0	0	75	1011	10
6	5	13	133	17	2.9	0.108	0.428	0.005	972	82	-39.1	0.212	0.48	0.23	0.9	111	10	301	3	0	0	999	1011	10
6	5	13	133	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.38	1.1	118	10	300.5	3	0	0	999	1012	99
6	5	13	133	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	1.2	97	10	299.1	3	0	0	999	1012	99
6	5	13	133	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	299.2	3	0	0	85	1013	7
6	5	13	133	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	106	10	299.1	3	0	0	88	1014	7
6	5	13	133	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	116	10	299.1	3	0	0	88	1014	7
6	5	13	133	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	298.9	3	0	0	91	1014	7
6	5	13	133	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	94	10	298.6	3	0	0	94	1013	7
6	5	14	134	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	73	10	298.5	3	0	0	94	1013	7
6	5	14	134	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	76	10	298.4	3	0	0	94	1013	7
6	5	14	134	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	298.4	3	0	0	88	1012	7
6	5	14	134	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	298.2	3	0	0	88	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	14	134	5	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	98	10	298.2	3	0	0	88	1013	3
6	5	14	134	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	298.9	3	0	0	88	1013	7
6	5	14	134	7	21.1	0.158	0.775	0.006	795	145	-16.9	0.212	0.48	0.4	1.2	98	10	301.1	3	0	0	82	1014	0
6	5	14	134	8	67.8	0.255	1.166	0.006	847	296	-22.1	0.212	0.48	0.23	2	113	10	303	3	0	0	75	1014	0
6	5	14	134	9	107.3	0.285	1.395	0.006	917	349	-19.4	0.212	0.48	0.19	2.2	115	10	304.5	3	0	0	65	1015	5
6	5	14	134	10	144.9	0.312	1.594	0.005	1012	400	-18.9	0.212	0.48	0.18	2.4	116	10	305.6	3	0	0	56	1014	4
6	5	14	134	11	130.7	0.309	1.582	0.005	1098	394	-20.4	0.212	0.48	0.18	2.4	114	10	305.8	3	0	0	61	1014	7
6	5	14	134	12	164	0.306	1.762	0.005	1207	390	-15.8	0.212	0.48	0.18	2.3	104	10	306.6	3	0	0	61	1013	6
6	5	14	134	13	120.8	0.288	1.626	0.005	1287	355	-17.8	0.212	0.48	0.18	2.2	111	10	306.4	3	0	0	58	1012	8
6	5	14	134	14	120.3	0.297	1.663	0.005	1382	372	-19.7	0.212	0.48	0.18	2.3	117	10	305.8	3	0	0	61	1012	8
6	5	14	134	15	82.3	0.306	1.497	0.005	1470	390	-31.5	0.212	0.48	0.18	2.5	114	10	304.8	3	0	0	56	1011	9
6	5	14	134	16	53.1	0.269	1.31	0.005	1527	321	-32.9	0.212	0.48	0.19	2.2	110	10	304.1	3	0	0	61	1011	9
6	5	14	134	17	17.8	0.221	0.913	0.005	1541	240	-54.9	0.212	0.48	0.23	1.9	120	10	302.9	3	0	0	72	1012	10
6	5	14	134	18	0.1	0.125	0.162	0.005	1528	105	-1774.1	0.212	0.48	0.38	1.2	106	10	299.4	3	0	3.05	75	1013	7
6	5	14	134	19	-2.3	0.052	-9	-9	-999	29	5.6	0.212	0.48	1	1	105	10	299.2	3	0	0	74	1013	3
6	5	14	134	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	298.8	3	0	0	77	1014	3
6	5	14	134	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	87	10	298.4	3	0	0	77	1014	3
6	5	14	134	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	83	10	298.2	3	0	0	77	1014	3
6	5	14	134	23	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	99	10	298	3	0	0	79	1014	3
6	5	14	134	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	88	10	297.8	3	0	0	82	1013	3
6	5	15	135	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.8	3	0	0	88	1013	3
6	5	15	135	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	61	10	297.2	3	0	0	90	1012	0
6	5	15	135	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	297.2	3	0	0	88	1012	3
6	5	15	135	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	61	10	297	3	0	0	94	1012	3
6	5	15	135	5	-2.3	0.056	-9	-9	-999	30	6.7	0.562	0.7	1	0.8	83	10	297.4	3	0	0	94	1013	0
6	5	15	135	6	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	86	10	298.9	3	0	0	88	1013	7
6	5	15	135	7	30.1	0.183	0.866	0.005	779	179	-18.2	0.212	0.48	0.4	1.4	97	10	301.5	3	0	0	77	1014	0
6	5	15	135	8	81.8	0.259	1.251	0.005	867	303	-19.2	0.212	0.48	0.23	2	99	10	303	3	0	0	72	1014	0
6	5	15	135	9	121.6	0.26	1.476	0.005	959	305	-13	0.212	0.48	0.19	1.9	103	10	304.8	3	0	0	65	1015	0
6	5	15	135	10	145	0.254	1.632	0.005	1085	295	-10.3	0.212	0.48	0.18	1.8	104	10	305.9	3	0	0	59	1014	4
6	5	15	135	11	156.4	0.256	1.79	0.008	1329	299	-9.8	0.212	0.48	0.18	1.8	103	10	306.4	3	0	0	52	1014	6
6	5	15	135	12	129.9	0.262	1.741	0.01	1472	308	-12.5	0.212	0.48	0.18	1.9	105	10	306.8	3	0	0	50	1013	8
6	5	15	135	13	111.6	0.258	1.67	0.011	1509	301	-13.8	0.212	0.48	0.18	1.9	105	10	306.1	3	0	0	52	1012	8
6	5	15	135	14	119.2	0.269	1.721	0.011	1545	321	-14.7	0.212	0.48	0.18	2	104	10	306.5	3	0	0	54	1012	8
6	5	15	135	15	90.2	0.261	1.575	0.011	1565	307	-17.9	0.212	0.48	0.18	2	92	10	305.8	3	0	0	65	1011	8
6	5	15	135	16	67.9	0.34	1.438	0.011	1579	456	-52.3	0.562	0.7	0.19	2.1	83	10	304.6	3	0	0	55	1010	9
6	5	15	135	17	19.4	0.288	0.947	0.011	1582	357	-111.5	0.562	0.7	0.23	1.9	83	10	303.4	3	0	0	59	1011	10
6	5	15	135	18	0.1	0.166	0.164	0.011	1581	163	-4162.8	0.212	0.48	0.38	1.6	88	10	301.4	3	0	0	67	1012	7
6	5	15	135	19	-2.9	0.062	-9	-9	-999	44	7.5	0.212	0.48	1	1.2	87	10	300.2	3	0	0	74	1012	7
6	5	15	135	20	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	74	10	299.4	3	0	0	79	1013	7
6	5	15	135	21	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	80	10	299	3	0	0	79	1014	7
6	5	15	135	22	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	84	10	299.2	3	0	0	82	1014	7
6	5	15	135	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	89	10	298.5	3	0	0	82	1013	0
6	5	15	135	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	48	10	298.1	3	0	0	88	1013	7
6	5	16	136	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	42	10	297.8	3	0	0	88	1012	7
6	5	16	136	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	49	10	297.6	3	0	0	88	1012	7
6	5	16	136	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	46	10	297.4	3	0	0	88	1012	7
6	5	16	136	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	297.5	3	0	0	94	1012	7
6	5	16	136	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	54	10	297.5	3	0	0	90	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	16	136	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	63	10	299.2	3	0	0	90	1013	7
6	5	16	136	7	25.7	0.182	0.838	0.005	825	178	-21	0.562	0.7	0.39	1	84	10	301.4	3	0	0	82	1013	0
6	5	16	136	8	78	0.23	1.241	0.005	885	254	-14.1	0.212	0.48	0.23	1.7	104	10	303.9	3	0	0	72	1013	0
6	5	16	136	9	119.1	0.24	1.476	0.005	977	270	-10.4	0.212	0.48	0.19	1.7	104	10	305.5	3	0	0	999	1013	0
6	5	16	136	10	109.7	0.248	1.477	0.005	1062	283	-12.5	0.212	0.48	0.18	1.8	115	10	306.1	3	0	0	999	1013	8
6	5	16	136	11	111.6	0.189	1.548	0.005	1203	189	-5.4	0.212	0.48	0.18	1.2	128	10	303.2	3	0	6.86	999	1012	8
6	5	16	136	12	160.9	0.267	1.854	0.005	1431	317	-10.7	0.212	0.48	0.18	1.9	98	10	306.4	3	0	0	999	1011	6
6	5	16	136	13	126.8	0.241	1.792	0.006	1638	273	-10	0.212	0.48	0.18	1.7	108	10	306.5	3	0	0	75	1010	8
6	5	16	136	14	45	0.244	1.274	0.006	1654	277	-29	0.674	0.73	0.17	1.3	238	10	303.6	3	0	0	68	1009	10
6	5	16	136	15	24.8	0.257	1.046	0.006	1663	299	-61.5	0.674	0.73	0.17	1.5	230	10	302.8	3	0	0	70	1009	10
6	5	16	136	16	18.1	0.121	0.943	0.006	1672	108	-8.8	0.24	0.3	0.17	0.8	260	10	303.5	3	0	0	62	1009	10
6	5	16	136	17	0.1	-9	-9	-9	1670	-999	-99999	0.475	0.6	0.22	0	0	10	302	3	0	0	65	1009	10
6	5	16	136	18	0.1	0.125	0.167	0.006	1669	102	-1770.6	0.212	0.48	0.38	1.2	109	10	301.4	3	0	0	75	1010	3
6	5	16	136	19	-3.8	0.067	-9	-9	-999	41	7.3	0.212	0.48	1	1.3	104	10	300.5	3	0	0	88	1011	3
6	5	16	136	20	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	97	10	299.9	3	0	0	88	1011	7
6	5	16	136	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	98	10	299.4	3	0	0	88	1012	3
6	5	16	136	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	82	10	299.1	3	0	0	88	1012	3
6	5	16	136	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	95	10	299	3	0	0	94	1012	7
6	5	16	136	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	298.9	3	0	0	94	1012	3
6	5	17	137	1	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	115	10	299	3	0	0	100	1011	3
6	5	17	137	2	-3.4	0.067	-9	-9	-999	40	8.1	0.212	0.48	1	1.3	119	10	299.4	3	0	0	94	1010	7
6	5	17	137	3	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	120	10	299.1	3	0	0	100	1010	3
6	5	17	137	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	118	10	299.1	3	0	0	100	1011	3
6	5	17	137	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	298.9	3	0	0	97	1012	3
6	5	17	137	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	56	10	298.9	3	0	0	100	1012	3
6	5	17	137	7	31.1	0.155	0.612	0.005	266	140	-10.7	0.212	0.48	0.4	1.1	125	10	300.9	3	0	0	94	1013	0
6	5	17	137	8	96	0.263	1.265	0.005	762	311	-17.2	0.212	0.48	0.23	2	128	10	303.6	3	0	0	80	1014	0
6	5	17	137	9	126.2	0.27	1.515	0.005	997	323	-14.1	0.212	0.48	0.19	2	136	10	305	3	0	0	85	1014	0
6	5	17	137	10	93.4	0.253	1.404	0.005	1073	293	-15.7	0.212	0.48	0.18	1.9	139	10	303.2	3	0	0.25	85	1014	8
6	5	17	137	11	151.4	0.313	1.713	0.005	1202	402	-18.3	0.212	0.48	0.18	2.4	136	10	305.5	3	0	0	64	1013	6
6	5	17	137	12	141.5	0.283	1.73	0.006	1322	347	-14.5	0.212	0.48	0.18	2.1	137	10	306.4	3	0	0	66	1013	7
6	5	17	137	13	52	0.212	1.25	0.006	1360	226	-16.5	0.212	0.48	0.18	1.6	117	10	303	3	0	0	66	1012	10
6	5	17	137	14	65.1	0.294	1.36	0.005	1394	367	-35.2	0.687	0.8	0.18	1.6	141	10	303.4	3	0	0	66	1012	10
6	5	17	137	15	16.9	0.155	0.869	0.005	1399	151	-19.8	0.212	0.48	0.18	1.2	121	10	301.8	3	0	0	79	1011	10
6	5	17	137	16	42.6	0.264	1.188	0.005	1419	312	-38.9	0.212	0.48	0.19	2.2	115	10	303.5	3	0	0	70	1011	10
6	5	17	137	17	12.1	0.226	0.781	0.005	1423	247	-85.8	0.212	0.48	0.23	2	117	10	302.6	3	0	0	70	1011	10
6	5	17	137	18	0.1	0.166	0.158	0.005	1421	157	-4162.8	0.212	0.48	0.38	1.6	111	10	301.2	3	0	0	80	1012	7
6	5	17	137	19	-3.3	0.062	-9	-9	-999	43	6.7	0.212	0.48	1	1.2	102	10	300.5	3	0	0	88	1013	3
6	5	17	137	20	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	110	10	299.9	3	0	0	88	1013	3
6	5	17	137	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	101	10	299.6	3	0	0	94	1014	3
6	5	17	137	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	299.4	3	0	0	94	1014	3
6	5	17	137	23	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	103	10	299.2	3	0	0	94	1014	0
6	5	17	137	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	299.2	3	0	0	94	1014	3
6	5	18	138	1	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	100	10	299.1	3	0	0	94	1014	3
6	5	18	138	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	90	10	298.6	3	0	0	97	1013	7
6	5	18	138	3	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	298.2	3	0	0	94	1013	3
6	5	18	138	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	77	10	298.2	3	0	0	100	1014	3
6	5	18	138	5	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	77	10	298.1	3	0	0	97	1014	0
6	5	18	138	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	78	10	299.9	3	0	0	94	1015	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	18	138	7	18	0.175	0.476	0.005	217	168	-26.8	0.212	0.48	0.39	1.4	104	10	301.1	3	0	0	88	1015	0
6	5	18	138	8	58.7	0.233	0.916	0.005	474	258	-19.5	0.212	0.48	0.23	1.8	100	10	302.8	3	0	0	91	1015	5
6	5	18	138	9	103	0.265	1.356	0.005	878	314	-16.3	0.212	0.48	0.19	2	91	10	301.9	3	0	1.52	77	1015	5
6	5	18	138	10	126.4	0.298	1.54	0.005	1048	375	-19	0.212	0.48	0.18	2.3	104	10	303.9	3	0	0	70	1015	7
6	5	18	138	11	151.3	0.341	1.683	0.006	1142	458	-23.7	0.212	0.48	0.18	2.7	114	10	305.4	3	0	0	66	1014	6
6	5	18	138	12	117.2	0.306	1.579	0.006	1215	389	-22	0.212	0.48	0.18	2.4	118	10	305.4	3	0	0	58	1014	8
6	5	18	138	13	130.9	0.337	1.675	0.005	1298	451	-26.5	0.212	0.48	0.18	2.7	120	10	305.9	3	0	0	62	1013	8
6	5	18	138	14	117.4	0.353	1.645	0.005	1371	482	-33.8	0.212	0.48	0.18	2.9	128	10	305.9	3	0	0	58	1012	8
6	5	18	138	15	69.2	0.302	1.394	0.005	1413	383	-36	0.212	0.48	0.18	2.5	128	10	305.2	3	0	0	58	1011	9
6	5	18	138	16	45.8	0.303	1.223	0.005	1440	383	-54.6	0.212	0.48	0.19	2.6	126	10	304.2	3	0	0	59	1011	9
6	5	18	138	17	9.4	0.242	0.721	0.005	1442	275	-136.6	0.212	0.48	0.23	2.2	122	10	302.9	3	0	0	63	1012	10
6	5	18	138	18	0.1	0.177	0.159	0.005	1440	172	-4988.8	0.212	0.48	0.37	1.7	113	10	301.5	3	0	0	70	1012	3
6	5	18	138	19	-2.4	0.057	-9	-9	-999	44	6.9	0.212	0.48	1	1.1	112	10	300.4	3	0	0	79	1013	7
6	5	18	138	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	106	10	299.9	3	0	0	82	1013	0
6	5	18	138	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	103	10	299.4	3	0	0	88	1014	3
6	5	18	138	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	299.1	3	0	0	88	1015	3
6	5	18	138	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	71	10	298.9	3	0	0	88	1015	0
6	5	18	138	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	68	10	298.4	3	0	0	88	1014	3
6	5	19	139	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	81	10	297.9	3	0	0	88	1014	3
6	5	19	139	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	88	10	297.5	3	0	0	91	1014	0
6	5	19	139	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	297.2	3	0	0	88	1014	3
6	5	19	139	4	-2.5	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	92	10	297.2	3	0	0	74	1014	7
6	5	19	139	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	296.9	3	0	0	82	1015	3
6	5	19	139	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	92	10	298.4	3	0	0	90	1015	3
6	5	19	139	7	29	0.163	0.798	0.005	635	152	-13.6	0.212	0.48	0.39	1.2	92	10	301.1	3	0	0	85	1016	0
6	5	19	139	8	76.3	0.239	1.174	0.005	769	268	-16.2	0.212	0.48	0.23	1.8	114	10	303.4	3	0	0	72	1016	0
6	5	19	139	9	112.9	0.258	1.437	0.005	954	301	-13.8	0.212	0.48	0.19	1.9	115	10	304.9	3	0	0	70	1016	0
6	5	19	139	10	142	0.283	1.673	0.005	1196	346	-14.4	0.212	0.48	0.18	2.1	127	10	305.8	3	0	0	52	1015	5
6	5	19	139	11	159.3	0.314	1.865	0.006	1475	405	-17.6	0.212	0.48	0.18	2.4	124	10	306.4	3	0	0	52	1015	6
6	5	19	139	12	162.6	0.306	1.91	0.006	1552	389	-15.9	0.212	0.48	0.18	2.3	129	10	306.9	3	0	0	47	1014	6
6	5	19	139	13	150.9	0.294	1.886	0.005	1609	367	-15.2	0.212	0.48	0.18	2.2	131	10	307	3	0	0	45	1013	7
6	5	19	139	14	128.3	0.308	1.805	0.005	1657	394	-20.6	0.212	0.48	0.18	2.4	134	10	306.8	3	0	0	49	1013	8
6	5	19	139	15	90.4	0.299	1.617	0.005	1690	377	-26.8	0.212	0.48	0.18	2.4	128	10	305.9	3	0	0	52	1012	9
6	5	19	139	16	43.2	0.255	1.267	0.005	1704	297	-34.6	0.212	0.48	0.19	2.1	119	10	304.6	3	0	0	52	1012	10
6	5	19	139	17	10.8	0.215	0.8	0.005	1706	229	-82.7	0.212	0.48	0.23	1.9	119	10	302.9	3	0	0	55	1013	10
6	5	19	139	18	0.1	0.136	0.168	0.005	1703	116	-2248.5	0.212	0.48	0.37	1.3	110	10	301	3	0	0	67	1013	3
6	5	19	139	19	-2.3	0.052	-9	-9	-999	31	5.6	0.212	0.48	1	1	116	10	300	3	0	0	74	1013	3
6	5	19	139	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	299.2	3	0	0	79	1014	3
6	5	19	139	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	103	10	298.9	3	0	0	82	1014	3
6	5	19	139	22	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	92	10	298.4	3	0	0	88	1014	3
6	5	19	139	23	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	85	10	298	3	0	0	88	1014	0
6	5	19	139	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	80	10	297.8	3	0	0	94	1013	3
6	5	20	140	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	82	10	297.5	3	0	0	94	1013	3
6	5	20	140	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	297.5	3	0	0	93	1013	3
6	5	20	140	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	93	10	297.2	3	0	0	90	1013	7
6	5	20	140	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	90	10	297	3	0	0	90	1013	3
6	5	20	140	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	59	10	296.4	3	0	0	90	1013	3
6	5	20	140	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	298.2	3	0	0	97	1013	3
6	5	20	140	7	37.1	0.163	0.976	0.005	904	151	-10.5	0.562	0.7	0.39	0.8	71	10	301.4	3	0	0	90	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	20	140	8	80.5	0.182	1.298	0.005	983	179	-6.8	0.212	0.48	0.23	1.2	99	10	303.4	3	0	0	74	1015	0
6	5	20	140	9	48.2	0.191	1.111	0.005	1030	192	-13.1	0.212	0.48	0.19	1.4	124	10	303.4	3	0	0	65	1015	9
6	5	20	140	10	122	0.24	1.57	0.005	1150	271	-10.3	0.212	0.48	0.18	1.7	122	10	304	3	0	0	59	1014	7
6	5	20	140	11	148.7	0.245	1.747	0.005	1298	280	-9	0.212	0.48	0.18	1.7	108	10	306	3	0	0	52	1014	7
6	5	20	140	12	140.3	0.254	1.773	0.005	1438	294	-10.5	0.212	0.48	0.18	1.8	101	10	306.8	3	0	0	45	1013	7
6	5	20	140	13	140.3	0.263	1.867	0.006	1676	311	-11.7	0.212	0.48	0.18	1.9	110	10	306.9	3	0	0	44	1012	7
6	5	20	140	14	119.2	0.269	1.788	0.007	1733	321	-14.7	0.212	0.48	0.18	2	108	10	306.5	3	0	0	46	1012	8
6	5	20	140	15	90.1	0.29	1.642	0.007	1774	359	-24.3	0.212	0.48	0.18	2.3	121	10	305.4	3	0	0	52	1011	9
6	5	20	140	16	53.5	0.25	1.386	0.006	1798	288	-26.4	0.212	0.48	0.19	2	104	10	304.9	3	0	0	75	1011	9
6	5	20	140	17	16.4	0.248	0.936	0.006	1803	285	-84.2	0.212	0.48	0.23	2.2	105	10	302.9	3	0	0	63	1012	10
6	5	20	140	18	0.1	0.146	0.171	0.006	1799	132	-2799.3	0.212	0.48	0.37	1.4	108	10	300.8	3	0	0	67	1012	3
6	5	20	140	19	-2.3	0.052	-9	-9	-999	33	5.6	0.212	0.48	1	1	106	10	299.9	3	0	0	74	1013	3
6	5	20	140	20	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	93	10	299.1	3	0	0	77	1013	3
6	5	20	140	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	298.5	3	0	0	85	1013	3
6	5	20	140	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	298.1	3	0	0	69	1013	3
6	5	20	140	23	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	113	10	298.2	3	0	0	71	1013	0
6	5	20	140	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	110	10	298	3	0	0	74	1012	3
6	5	21	141	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	106	10	297.5	3	0	0	74	1012	3
6	5	21	141	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	96	10	297.2	3	0	0	71	1012	0
6	5	21	141	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	297.1	3	0	0	90	1012	3
6	5	21	141	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	94	10	297.2	3	0	0	94	1012	3
6	5	21	141	5	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	59	10	297	3	0	0	94	1012	0
6	5	21	141	6	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	40	10	298.5	3	0	0	90	1013	3
6	5	21	141	7	29.5	0.124	0.692	0.005	406	101	-5.9	0.212	0.48	0.39	0.8	89	10	302	3	0	0	88	1013	0
6	5	21	141	8	61	0.234	1.114	0.005	818	260	-18.9	0.212	0.48	0.23	1.8	108	10	303.4	3	0	0	72	1013	0
6	5	21	141	9	81.3	0.259	1.254	0.005	876	303	-19.3	0.212	0.48	0.19	2	113	10	302.2	3	0	0.25	70	1013	7
6	5	21	141	10	78.3	0.23	1.271	0.005	947	254	-14	0.212	0.48	0.18	1.7	135	10	302.8	3	0	0	70	1013	9
6	5	21	141	11	149.9	0.331	1.673	0.006	1128	439	-21.9	0.212	0.48	0.18	2.6	109	10	305.6	3	0	0	56	1012	6
6	5	21	141	12	124.9	0.326	1.642	0.006	1282	429	-25.1	0.212	0.48	0.18	2.6	121	10	305.9	3	0	0	56	1012	8
6	5	21	141	13	121.9	0.326	1.657	0.006	1346	428	-25.5	0.212	0.48	0.18	2.6	112	10	305.9	3	0	0	50	1011	8
6	5	21	141	14	103.8	0.322	1.583	0.005	1379	420	-28.9	0.212	0.48	0.18	2.6	114	10	305.4	3	0	0	60	1010	9
6	5	21	141	15	75	0.314	1.428	0.005	1401	404	-37	0.212	0.48	0.18	2.6	112	10	304.9	3	0	0	56	1009	9
6	5	21	141	16	42.8	0.292	1.187	0.005	1411	363	-52.4	0.212	0.48	0.19	2.5	113	10	303.9	3	0	0	56	1009	10
6	5	21	141	17	12	0.245	0.778	0.005	1412	279	-110.1	0.212	0.48	0.23	2.2	107	10	302.4	3	0	0	65	1010	10
6	5	21	141	18	0.1	0.146	0.158	0.005	1411	132	-2794.6	0.212	0.48	0.37	1.4	109	10	301.2	3	0	0	70	1010	3
6	5	21	141	19	-2.7	0.057	-9	-9	-999	36	6.1	0.212	0.48	1	1.1	96	10	300.5	3	0	0	74	1011	3
6	5	21	141	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	299.9	3	0	0	82	1012	3
6	5	21	141	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	96	10	299.5	3	0	0	82	1012	3
6	5	21	141	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	96	10	299.4	3	0	0	82	1013	3
6	5	21	141	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	98	10	299.1	3	0	0	85	1013	0
6	5	21	141	24	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	104	10	298.9	3	0	0	82	1012	3
6	5	22	142	1	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	98	10	298.9	3	0	0	88	1011	3
6	5	22	142	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	92	10	298.4	3	0	0	88	1011	0
6	5	22	142	3	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	297.9	3	0	0	82	1011	3
6	5	22	142	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	109	10	297.9	3	0	0	82	1011	3
6	5	22	142	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	91	10	298.1	3	0	0	88	1012	7
6	5	22	142	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	95	10	299.5	3	0	0	88	1013	7
6	5	22	142	7	26.1	0.208	0.844	0.005	834	219	-31.4	0.212	0.48	0.39	1.7	94	10	301.8	3	0	0	82	1014	0
6	5	22	142	8	80.7	0.297	1.271	0.005	920	371	-29.2	0.212	0.48	0.23	2.4	94	10	303.6	3	0	0	72	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	22	142	9	112.9	0.333	1.481	0.005	1042	442	-29.6	0.212	0.48	0.19	2.7	109	10	305	3	0	0	59	1015	0
6	5	22	142	10	115.3	0.315	1.549	0.005	1167	406	-24.5	0.212	0.48	0.18	2.5	108	10	305.6	3	0	0	56	1015	7
6	5	22	142	11	117	0.325	1.675	0.005	1454	426	-26.5	0.212	0.48	0.18	2.6	120	10	305.2	3	0	0	57	1015	8
6	5	22	142	12	132.5	0.328	1.794	0.006	1579	432	-24	0.212	0.48	0.18	2.6	113	10	306.1	3	0	0	52	1014	8
6	5	22	142	13	114.6	0.334	1.783	0.009	1789	443	-29.3	0.212	0.48	0.18	2.7	112	10	306	3	0	0	56	1013	8
6	5	22	142	14	108.4	0.332	1.784	0.011	1894	440	-30.5	0.212	0.48	0.18	2.7	117	10	305.8	3	0	0	56	1012	8
6	5	22	142	15	72.1	0.303	1.561	0.011	1907	385	-34.9	0.212	0.48	0.18	2.5	112	10	305.1	3	0	0	52	1012	9
6	5	22	142	16	43	0.274	1.316	0.011	1914	329	-42.9	0.212	0.48	0.19	2.3	114	10	304.4	3	0	0	52	1012	10
6	5	22	142	17	13.7	0.227	0.899	0.011	1915	249	-77.3	0.212	0.48	0.23	2	102	10	303	3	0	0	59	1012	10
6	5	22	142	18	0.1	0.166	0.175	0.011	1914	157	-4167	0.212	0.48	0.37	1.6	105	10	301.4	3	0	0	67	1013	3
6	5	22	142	19	-2.7	0.057	-9	-9	-999	41	6.1	0.212	0.48	1	1.1	105	10	300.9	3	0	0	74	1014	3
6	5	22	142	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	110	10	300.2	3	0	0	77	1015	7
6	5	22	142	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	111	10	299.6	3	0	0	82	1015	3
6	5	22	142	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	116	10	299.4	3	0	0	82	1015	3
6	5	22	142	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	110	10	299	3	0	0	94	1015	3
6	5	22	142	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	103	10	298.8	3	0	0	94	1015	3
6	5	23	143	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	298.4	3	0	0	94	1014	7
6	5	23	143	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	298.2	3	0	0	94	1013	7
6	5	23	143	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	297.8	3	0	0	94	1013	3
6	5	23	143	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	297.4	3	0	0	94	1014	3
6	5	23	143	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	297.4	3	0	0	94	1014	3
6	5	23	143	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	79	10	298.5	3	0	0	94	1015	7
6	5	23	143	7	26	0.152	0.574	0.005	263	136	-12.2	0.212	0.48	0.39	1.1	89	10	301.5	3	0	0	88	1015	0
6	5	23	143	8	62.3	0.281	0.979	0.005	546	343	-32.3	0.212	0.48	0.23	2.3	102	10	303.2	3	0	0	77	1016	0
6	5	23	143	9	109.9	0.313	1.383	0.005	872	403	-25.4	0.212	0.48	0.19	2.5	104	10	304.9	3	0	0	65	1016	0
6	5	23	143	10	130.1	0.318	1.53	0.005	998	412	-22.4	0.212	0.48	0.18	2.5	114	10	305.5	3	0	0	56	1015	6
6	5	23	143	11	165.4	0.334	1.742	0.005	1159	444	-20.4	0.212	0.48	0.18	2.6	104	10	306.9	3	0	0	50	1015	5
6	5	23	143	12	161.4	0.324	1.803	0.005	1316	424	-19.1	0.212	0.48	0.18	2.5	105	10	307.2	3	0	0	47	1014	6
6	5	23	143	13	153.9	0.313	1.84	0.005	1465	403	-18.1	0.212	0.48	0.18	2.4	96	10	307	3	0	0	47	1014	7
6	5	23	143	14	123.6	0.326	1.799	0.009	1706	428	-25.3	0.212	0.48	0.18	2.6	96	10	306.2	3	0	0	52	1013	8
6	5	23	143	15	93	0.328	1.657	0.011	1771	432	-34.3	0.212	0.48	0.18	2.7	96	10	305.4	3	0	0	59	1013	8
6	5	23	143	16	41.4	0.31	1.272	0.012	1797	398	-65.1	0.212	0.48	0.19	2.7	102	10	304	3	0	0	59	1013	10
6	5	23	143	17	16.4	0.258	0.935	0.012	1803	302	-94.7	0.212	0.48	0.23	2.3	109	10	302.9	3	0	0	63	1014	10
6	5	23	143	18	0.1	0.177	0.171	0.012	1799	173	-4998.8	0.212	0.48	0.37	1.7	101	10	301.1	3	0	0	67	1014	7
6	5	23	143	19	-2.4	0.057	-9	-9	-999	45	6.9	0.212	0.48	1	1.1	104	10	300.2	3	0	0	72	1015	7
6	5	23	143	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	94	10	299.5	3	0	0	79	1015	7
6	5	23	143	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	83	10	299	3	0	0	82	1015	7
6	5	23	143	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	54	10	298.4	3	0	0	82	1015	7
6	5	23	143	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	47	10	297.9	3	0	0	88	1015	7
6	5	23	143	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	44	10	297.6	3	0	0	88	1014	7
6	5	24	144	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	51	10	297.4	3	0	0	88	1014	7
6	5	24	144	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	297.2	3	0	0	88	1013	7
6	5	24	144	3	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	91	10	297.1	3	0	0	85	1013	7
6	5	24	144	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	297.2	3	0	0	94	1013	7
6	5	24	144	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	296.9	3	0	0	97	1014	7
6	5	24	144	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	79	10	298.8	3	0	0	100	1014	7
6	5	24	144	7	35.7	0.226	0.939	0.005	840	247	-29.1	0.562	0.7	0.39	1.3	78	10	301.2	3	0	0	82	1015	0
6	5	24	144	8	79.2	0.27	1.274	0.005	946	323	-22.6	0.562	0.7	0.23	1.5	84	10	303.1	3	0	0	65	1016	0
6	5	24	144	9	90.7	0.233	1.387	0.006	1067	260	-12.7	0.212	0.48	0.19	1.7	135	10	303.4	3	0	0	59	1016	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	24	144	10	47.1	0.219	1.136	0.006	1126	236	-20.2	0.212	0.48	0.18	1.7	115	10	299.4	3	0	3.3	52	1016	10
6	5	24	144	11	153.3	0.246	1.781	0.008	1336	281	-8.8	0.212	0.48	0.18	1.7	101	10	303.4	3	0	0	50	1015	6
6	5	24	144	12	164.8	0.277	1.85	0.008	1392	336	-11.7	0.212	0.48	0.18	2	104	10	305.2	3	0	0	50	1014	6
6	5	24	144	13	105.4	0.247	1.607	0.008	1425	282	-12.9	0.212	0.48	0.18	1.8	110	10	305.4	3	0	0	56	1013	9
6	5	24	144	14	106.9	0.227	1.628	0.008	1459	249	-9.9	0.212	0.48	0.18	1.6	95	10	305.9	3	0	0	52	1013	8
6	5	24	144	15	82.1	0.22	1.5	0.008	1484	237	-11.7	0.562	0.7	0.18	1.1	25	10	305	3	0	0	52	1012	9
6	5	24	144	16	58.8	0.25	1.347	0.008	1502	287	-24	0.562	0.7	0.19	1.4	83	10	305	3	0	0	52	1012	9
6	5	24	144	17	13.8	0.199	0.832	0.008	1504	205	-51.4	0.212	0.48	0.23	1.7	106	10	303.4	3	0	0	57	1012	10
6	5	24	144	18	0.1	0.136	0.161	0.008	1502	116	-2248.5	0.212	0.48	0.37	1.3	105	10	301	3	0	0	67	1013	3
6	5	24	144	19	-2.7	0.057	-9	-9	-999	34	6.1	0.212	0.48	1	1.1	98	10	299.9	3	0	0	74	1014	3
6	5	24	144	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	88	10	299.4	3	0	0	79	1014	3
6	5	24	144	21	-2.3	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	80	10	298.8	3	0	0	82	1014	3
6	5	24	144	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	298.4	3	0	0	82	1014	3
6	5	24	144	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	70	10	297.9	3	0	0	85	1014	0
6	5	24	144	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	297.8	3	0	0	88	1013	3
6	5	25	145	1	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	90	10	297.6	3	0	0	85	1013	3
6	5	25	145	2	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.2	3	0	0	87	1012	0
6	5	25	145	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	118	10	297.2	3	0	0	90	1012	3
6	5	25	145	4	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	90	10	297.1	3	0	0	90	1012	3
6	5	25	145	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	91	10	297.4	3	0	0	93	1012	3
6	5	25	145	6	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	88	10	298.9	3	0	0	97	1013	3
6	5	25	145	7	28.1	0.172	0.853	0.005	798	164	-16.4	0.212	0.48	0.39	1.3	96	10	301.2	3	0	0	88	1014	0
6	5	25	145	8	60.9	0.196	1.2	0.005	1028	199	-11.1	0.212	0.48	0.23	1.4	94	10	303.2	3	0	0	74	1014	0
6	5	25	145	9	86.5	0.222	1.383	0.005	1108	241	-11.5	0.212	0.48	0.19	1.6	110	10	303.9	3	0	0	70	1014	7
6	5	25	145	10	131.6	0.262	1.647	0.005	1231	308	-12.4	0.212	0.48	0.18	1.9	111	10	305.5	3	0	0	63	1014	6
6	5	25	145	11	119	0.259	1.64	0.005	1342	304	-13.2	0.212	0.48	0.18	1.9	120	10	306.1	3	0	0	57	1014	8
6	5	25	145	12	92.1	0.253	1.538	0.005	1428	292	-15.8	0.212	0.48	0.18	1.9	128	10	305.9	3	0	0	54	1013	9
6	5	25	145	13	58.3	-9	-9	-9	1481	-999	-99999	0.475	0.6	0.17	0	0	10	305.1	3	0	0	56	1012	10
6	5	25	145	14	51.1	0.246	1.293	0.006	1526	281	-26.4	0.562	0.7	0.18	1.4	342	10	303.5	3	0	0	54	1011	10
6	5	25	145	15	42.1	0.179	1.223	0.007	1567	176	-12.3	0.212	0.48	0.18	1.3	119	10	304.6	3	0	0	56	1010	10
6	5	25	145	16	47.7	0.229	1.287	0.008	1610	252	-22.6	0.212	0.48	0.19	1.8	114	10	305	3	0	0	56	1010	9
6	5	25	145	17	6.6	0.2	0.667	0.008	1611	206	-109.1	0.212	0.48	0.23	1.8	119	10	303	3	0	0	59	1010	10
6	5	25	145	18	0.1	0.146	0.165	0.008	1608	129	-2795.6	0.212	0.48	0.37	1.4	105	10	301.4	3	0	0	67	1011	3
6	5	25	145	19	-1.8	0.047	-9	-9	-999	31	5	0.212	0.48	1	0.9	115	10	300.4	3	0	0	74	1012	3
6	5	25	145	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	299.5	3	0	0	79	1012	3
6	5	25	145	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	82	10	299	3	0	0	77	1013	3
6	5	25	145	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	68	10	298.4	3	0	0	82	1013	3
6	5	25	145	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	298.1	3	0	0	88	1012	3
6	5	25	145	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	54	10	297.6	3	0	0	88	1012	3
6	5	26	146	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	297.2	3	0	0	94	1011	3
6	5	26	146	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	71	10	297	3	0	0	94	1011	0
6	5	26	146	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	297	3	0	0	94	1010	3
6	5	26	146	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	55	10	296.9	3	0	0	94	1011	3
6	5	26	146	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	62	10	296.8	3	0	0	94	1011	7
6	5	26	146	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	298.9	3	0	0	94	1012	3
6	5	26	146	7	28.3	0.143	-9	-9	-999	125	-9.4	0.212	0.48	0.39	1	95	10	301.9	3	0	0	82	1012	0
6	5	26	146	8	61.3	0.196	-9	-9	-999	199	-11	0.212	0.48	0.23	1.4	113	10	303.1	3	0	0	75	1013	3
6	5	26	146	9	88.3	0.242	-9	-9	-999	274	-14.6	0.212	0.48	0.19	1.8	114	10	304.4	3	0	0	65	1013	7
6	5	26	146	10	92.6	0.271	-9	-9	-999	325	-19.5	0.212	0.48	0.18	2.1	113	10	304.8	3	0	0	58	1013	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	26	146	11	69.5	0.227	-9	-9	-999	250	-15.3	0.212	0.48	0.18	1.7	110	10	305.5	3	0	0	56	1012	9
6	5	26	146	12	91.8	0.309	-9	-9	-999	395	-29	0.212	0.48	0.18	2.5	115	10	305.2	3	0	0	59	1012	9
6	5	26	146	13	110	0.285	-9	-9	-999	351	-19	0.212	0.48	0.18	2.2	107	10	305.8	3	0	0	58	1011	9
6	5	26	146	14	37.7	0.271	-9	-9	-999	324	-47.5	0.212	0.48	0.18	2.3	115	10	304.4	3	0	0	56	1010	10
6	5	26	146	15	36	0.233	-9	-9	-999	259	-31.6	0.212	0.48	0.18	1.9	110	10	304.4	3	0	0	61	1010	10
6	5	26	146	16	11.6	0.206	-9	-9	-999	215	-68	0.212	0.48	0.19	1.8	115	10	303.4	3	0	0	61	1010	10
6	5	26	146	17	4.9	0.198	-9	-9	-999	202	-141.5	0.212	0.48	0.23	1.8	107	10	302.4	3	0	0	65	1010	10
6	5	26	146	18	0.1	0.146	-9	-9	-999	129	-2794.6	0.212	0.48	0.37	1.4	98	10	301	3	0	0	79	1010	3
6	5	26	146	19	-3.3	0.062	-9	-9	-999	39	6.7	0.212	0.48	1	1.2	101	10	300.5	3	0	0	79	1011	3
6	5	26	146	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	99	10	299.9	3	0	0	82	1012	7
6	5	26	146	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	88	10	299.6	3	0	0	82	1012	3
6	5	26	146	22	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	80	10	299.4	3	0	0	82	1013	3
6	5	26	146	23	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	93	10	299.1	3	0	0	79	1012	7
6	5	26	146	24	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	98	10	298.6	3	0	0	82	1011	3
6	5	27	147	1	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	110	10	298.5	3	0	0	82	1010	3
6	5	27	147	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	81	10	298.2	3	0	0	88	1010	7
6	5	27	147	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	81	10	297.6	3	0	0	88	1010	7
6	5	27	147	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	60	10	297.6	3	0	0	88	1010	3
6	5	27	147	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	23	10	297.4	3	0	0	94	1010	3
6	5	27	147	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	44	10	299.4	3	0	0	88	1011	3
6	5	27	147	7	30.6	0.154	-9	-9	-999	139	-10.8	0.212	0.48	0.39	1.1	100	10	302	3	0	0	88	1012	0
6	5	27	147	8	70.8	0.275	-9	-9	-999	332	-26.5	0.212	0.48	0.23	2.2	112	10	303.6	3	0	0	72	1012	0
6	5	27	147	9	88.2	0.261	-9	-9	-999	307	-18.2	0.212	0.48	0.19	2	126	10	304.4	3	0	0	65	1012	7
6	5	27	147	10	88.4	0.27	-9	-9	-999	323	-20.2	0.212	0.48	0.18	2.1	120	10	305.2	3	0	0	58	1013	8
6	5	27	147	11	148.7	0.312	-9	-9	-999	401	-18.5	0.212	0.48	0.18	2.4	117	10	306	3	0	0	61	1012	6
6	5	27	147	12	152.1	0.322	-9	-9	-999	421	-19.9	0.212	0.48	0.18	2.5	126	10	306.5	3	0	0	56	1012	7
6	5	27	147	13	141.9	0.293	-9	-9	-999	364	-15.9	0.212	0.48	0.18	2.2	114	10	307	3	0	0	56	1010	7
6	5	27	147	14	84.5	0.298	-9	-9	-999	374	-28.1	0.212	0.48	0.18	2.4	117	10	305.8	3	0	0	52	1010	9
6	5	27	147	15	82.9	0.288	-9	-9	-999	355	-25.9	0.212	0.48	0.18	2.3	104	10	305.9	3	0	0	54	1009	9
6	5	27	147	16	58	0.28	-9	-9	-999	340	-34	0.212	0.48	0.19	2.3	115	10	305	3	0	0	56	1009	9
6	5	27	147	17	16.6	0.23	-9	-9	-999	254	-65.6	0.212	0.48	0.22	2	120	10	303.4	3	0	0	65	1010	10
6	5	27	147	18	0.1	0.156	-9	-9	-999	143	-3430.8	0.212	0.48	0.37	1.5	107	10	301.4	3	0	0	70	1010	3
6	5	27	147	19	-2.3	0.052	-9	-9	-999	36	5.6	0.212	0.48	1	1	108	10	300.4	3	0	0	74	1011	3
6	5	27	147	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	116	10	299.9	3	0	0	82	1012	3
6	5	27	147	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	102	10	299.4	3	0	0	82	1012	3
6	5	27	147	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	78	10	299	3	0	0	88	1013	3
6	5	27	147	23	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	298.6	3	0	0	88	1012	3
6	5	27	147	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	58	10	298.4	3	0	0	88	1012	3
6	5	28	148	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	21	10	297.9	3	0	0	88	1011	3
6	5	28	148	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	46	10	297.8	3	0	0	91	1011	7
6	5	28	148	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	76	10	297.9	3	0	0	94	1011	3
6	5	28	148	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	45	10	297.6	3	0	0	88	1011	3
6	5	28	148	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	70	10	297.4	3	0	0	88	1012	3
6	5	28	148	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	299.2	3	0	0	88	1012	7
6	5	28	148	7	23.9	0.169	-9	-9	-999	160	-18.4	0.212	0.48	0.39	1.3	103	10	301.8	3	0	0	77	1013	0
6	5	28	148	8	59.4	0.243	-9	-9	-999	275	-21.7	0.212	0.48	0.23	1.9	116	10	303.1	3	0	0	72	1013	0
6	5	28	148	9	108.8	0.257	-9	-9	-999	300	-14.1	0.212	0.48	0.19	1.9	122	10	304.9	3	0	0	65	1013	4
6	5	28	148	10	103.5	0.265	-9	-9	-999	314	-16.3	0.212	0.48	0.18	2	128	10	305.5	3	0	0	65	1013	8
6	5	28	148	11	97.7	0.264	-9	-9	-999	311	-16.9	0.212	0.48	0.18	2	136	10	305.2	3	0	0	77	1013	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	28	148	12	105.3	0.275	-9	-9	-999	331	-17.8	0.212	0.48	0.18	2.1	120	10	305.2	3	0	0	58	1012	9
6	5	28	148	13	86.3	0.26	-9	-9	-999	306	-18.4	0.212	0.48	0.18	2	122	10	306	3	0	0	56	1011	9
6	5	28	148	14	45.5	0.228	-9	-9	-999	250	-23.4	0.212	0.48	0.18	1.8	109	10	305.1	3	0	0	56	1010	10
6	5	28	148	15	30.1	0.22	-9	-9	-999	238	-32	0.212	0.48	0.18	1.8	111	10	304.4	3	0	0	56	1009	10
6	5	28	148	16	19.1	0.213	-9	-9	-999	226	-45.4	0.212	0.48	0.19	1.8	109	10	303.6	3	0	0	59	1009	10
6	5	28	148	17	12.1	0.216	-9	-9	-999	231	-75.2	0.212	0.48	0.22	1.9	106	10	302.6	3	0	0	67	1010	10
6	5	28	148	18	0.1	0.166	-9	-9	-999	157	-4155.9	0.212	0.48	0.37	1.6	107	10	301	3	0	0	67	1010	7
6	5	28	148	19	-2.4	0.057	-9	-9	-999	40	6.9	0.212	0.48	1	1.1	110	10	300	3	0	0	72	1011	7
6	5	28	148	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	111	10	299.4	3	0	0	79	1012	7
6	5	28	148	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	110	10	298.9	3	0	0	82	1012	7
6	5	28	148	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	105	10	298.8	3	0	0	82	1012	7
6	5	28	148	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	298.4	3	0	0	88	1012	7
6	5	28	148	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	298	3	0	0	82	1011	7
6	5	29	149	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	298	3	0	0	88	1010	7
6	5	29	149	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	111	10	297.4	3	0	0	88	1010	7
6	5	29	149	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	79	10	297.1	3	0	0	85	1010	7
6	5	29	149	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	61	10	296.9	3	0	0	90	1011	7
6	5	29	149	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	56	10	296.5	3	0	0	93	1011	7
6	5	29	149	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	298.9	3	0	0	90	1012	7
6	5	29	149	7	38.6	0.19	-9	-9	-999	190	-16	0.562	0.7	0.39	1	82	10	301.5	3	0	0	88	1012	0
6	5	29	149	8	59.4	0.214	-9	-9	-999	228	-15	0.212	0.48	0.23	1.6	117	10	303	3	0	0	77	1013	0
6	5	29	149	9	102.9	0.256	-9	-9	-999	297	-14.6	0.212	0.48	0.19	1.9	114	10	304.8	3	0	0	71	1013	5
6	5	29	149	10	137.4	0.301	-9	-9	-999	379	-17.8	0.212	0.48	0.18	2.3	125	10	305.5	3	0	0	65	1012	5
6	5	29	149	11	154.9	0.295	-9	-9	-999	369	-15	0.212	0.48	0.18	2.2	130	10	306.5	3	0	0	56	1012	6
6	5	29	149	12	167.6	0.268	-9	-9	-999	320	-10.4	0.212	0.48	0.18	1.9	126	10	307.8	3	0	0	40	1011	6
6	5	29	149	13	65.6	0.235	-9	-9	-999	263	-17.9	0.212	0.48	0.18	1.8	115	10	306.4	3	0	0	41	1010	10
6	5	29	149	14	56.2	0.241	-9	-9	-999	273	-22.6	0.212	0.48	0.18	1.9	115	10	305.5	3	0	0	47	1010	10
6	5	29	149	15	22.7	0.206	-9	-9	-999	216	-34.9	0.212	0.48	0.18	1.7	116	10	304.4	3	0	0	56	1010	10
6	5	29	149	16	15.8	0.248	-9	-9	-999	284	-86.7	0.212	0.48	0.19	2.2	114	10	302.9	3	0	0	56	1009	10
6	5	29	149	17	12	0.245	-9	-9	-999	278	-110	0.212	0.48	0.22	2.2	104	10	302.4	3	0	0	70	1010	10
6	5	29	149	18	0.1	0.187	-9	-9	-999	187	-5908.5	0.212	0.48	0.37	1.8	106	10	300.9	3	0	0	72	1011	3
6	5	29	149	19	-3.4	0.067	-9	-9	-999	51	8.2	0.212	0.48	1	1.3	108	10	300	3	0	0	74	1011	7
6	5	29	149	20	-4.4	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	107	10	299.5	3	0	0	79	1012	3
6	5	29	149	21	-3.8	0.067	-9	-9	-999	40	7.2	0.212	0.48	1	1.3	99	10	299.1	3	0	0	79	1012	3
6	5	29	149	22	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	298.6	3	0	0	79	1012	3
6	5	29	149	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	60	10	297.9	3	0	0	82	1012	3
6	5	29	149	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	58	10	297.6	3	0	0	90	1012	3
6	5	30	150	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	46	10	297.2	3	0	0	85	1011	3
6	5	30	150	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	74	10	297.1	3	0	0	90	1010	0
6	5	30	150	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	297.2	3	0	0	88	1010	3
6	5	30	150	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	131	10	297.6	3	0	0	94	1011	3
6	5	30	150	5	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	132	10	298.1	3	0	0	94	1011	7
6	5	30	150	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	107	10	300.1	3	0	0	94	1012	7
6	5	30	150	7	31.8	0.174	-9	-9	-999	167	-15	0.212	0.48	0.39	1.3	98	10	302.4	3	0	0	82	1013	0
6	5	30	150	8	74.9	0.238	-9	-9	-999	268	-16.3	0.212	0.48	0.23	1.8	112	10	303.4	3	0	0	82	1013	0
6	5	30	150	9	115.7	0.296	-9	-9	-999	370	-20.2	0.212	0.48	0.19	2.3	119	10	304.9	3	0	0	63	1013	0
6	5	30	150	10	92.8	0.281	-9	-9	-999	343	-21.6	0.212	0.48	0.18	2.2	115	10	305	3	0	0	52	1013	8
6	5	30	150	11	127.6	0.317	-9	-9	-999	411	-22.6	0.212	0.48	0.18	2.5	116	10	305.4	3	0	0	54	1013	8
6	5	30	150	12	140	0.311	-9	-9	-999	398	-19.3	0.212	0.48	0.18	2.4	107	10	306.2	3	0	0	56	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	5	30	150	13	133.6	0.328	-9	-9	-999	432	-23.9	0.212	0.48	0.18	2.6	108	10	305.4	3	0	0	52	1012	8
6	5	30	150	14	106.7	0.285	-9	-9	-999	350	-19.5	0.212	0.48	0.18	2.2	114	10	305.4	3	0	0	50	1010	8
6	5	30	150	15	84.3	0.279	-9	-9	-999	338	-23.1	0.212	0.48	0.18	2.2	121	10	305.8	3	0	0	49	1010	9
6	5	30	150	16	43.1	0.255	-9	-9	-999	296	-34.6	0.212	0.48	0.19	2.1	107	10	304.4	3	0	0	55	1010	10
6	5	30	150	17	13.8	0.208	-9	-9	-999	219	-59	0.212	0.48	0.22	1.8	111	10	303.2	3	0	0	63	1010	10
6	5	30	150	18	0.1	0.125	-9	-9	-999	104	-1771.1	0.212	0.48	0.36	1.2	114	10	301.4	3	0	0	67	1011	7
6	5	30	150	19	-1.6	0.047	-9	-9	-999	26	5.6	0.212	0.48	1	0.9	112	10	300.4	3	0	0	74	1011	7
6	5	30	150	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	123	10	299.9	3	0	0	82	1012	7
6	5	30	150	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	134	10	299.2	3	0	0	88	1012	7
6	5	30	150	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	136	10	298.9	3	0	0	94	1013	7
6	5	30	150	23	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	155	10	298.6	3	0	0	88	1013	7
6	5	30	150	24	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	149	10	298.4	3	0	0	88	1012	7
6	5	31	151	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298	3	0	0	88	1012	7
6	5	31	151	2	-0.9	0.037	-9	-9	-999	17	5.4	0.687	0.8	1	0.5	141	10	297.6	3	0	0	94	1012	7
6	5	31	151	3	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	134	10	297.4	3	0	0	94	1011	7
6	5	31	151	4	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	128	10	297.2	3	0	0	94	1012	7
6	5	31	151	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.1	3	0	0	97	1012	7
6	5	31	151	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.1	3	0	0	94	1012	7
6	5	31	151	7	39.9	0.255	-9	-9	-999	296	-37.6	0.687	0.8	0.4	1.4	146	10	301.5	3	0	0	82	1013	0
6	5	31	151	8	71.9	0.247	-9	-9	-999	282	-18.9	0.212	0.48	0.23	1.9	127	10	303	3	0	0	77	1013	0
6	5	31	151	9	117.1	0.278	-9	-9	-999	337	-16.5	0.212	0.48	0.19	2.1	125	10	304.8	3	0	0	58	1013	0
6	5	31	151	10	88.3	0.242	-9	-9	-999	275	-14.5	0.212	0.48	0.18	1.8	138	10	305	3	0	0	61	1013	8
6	5	31	151	11	138.5	0.292	-9	-9	-999	363	-16.2	0.212	0.48	0.18	2.2	135	10	306.5	3	0	0	49	1012	7
6	5	31	151	12	96.9	0.291	-9	-9	-999	362	-23.1	0.212	0.48	0.18	2.3	127	10	306.4	3	0	0	47	1011	9
6	5	31	151	13	100.7	0.292	-9	-9	-999	364	-22.4	0.212	0.48	0.18	2.3	133	10	305.1	3	0	0	47	1011	9
6	5	31	151	14	49.9	0.267	-9	-9	-999	318	-34.4	0.212	0.48	0.18	2.2	125	10	304.9	3	0	0	49	1010	10
6	5	31	151	15	54.3	0.26	-9	-9	-999	304	-29.1	0.212	0.48	0.18	2.1	116	10	305	3	0	0	50	1009	10
6	5	31	151	16	53.6	0.297	-9	-9	-999	372	-43.9	0.212	0.48	0.19	2.5	122	10	305	3	0	0	52	1009	9
6	5	31	151	17	12.4	0.264	-9	-9	-999	313	-134.2	0.212	0.48	0.22	2.4	127	10	303.2	3	0	0	57	1010	10
6	5	31	151	18	0.1	0.197	-9	-9	-999	203	-6941.3	0.212	0.48	0.36	1.9	123	10	301.4	3	0	0	70	1010	3
6	5	31	151	19	-3.8	0.067	-9	-9	-999	55	7.3	0.212	0.48	1	1.3	120	10	300.4	3	0	0	74	1011	3
6	5	31	151	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	114	10	299.9	3	0	0	77	1012	7
6	5	31	151	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	105	10	299.4	3	0	0	82	1013	3
6	5	31	151	22	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	95	10	299.1	3	0	0	82	1013	3
6	5	31	151	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	298.9	3	0	0	85	1013	7
6	5	31	151	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	298.4	3	0	0	82	1012	3
6	6	1	152	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	64	10	298	3	0	0	82	1012	3
6	6	1	152	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	297.6	3	0	0	85	1012	3
6	6	1	152	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	67	10	297.4	3	0	0	94	1011	3
6	6	1	152	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	297	3	0	0	94	1012	3
6	6	1	152	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	84	10	296.9	3	0	0	94	1012	0
6	6	1	152	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	297.6	3	0	0	90	1012	3
6	6	1	152	7	16.7	0.133	-9	-9	-999	112	-12.8	0.37	0.38	0.4	0.8	91	10	300.5	3	0	0	88	1013	0
6	6	1	152	8	57	0.266	-9	-9	-999	315	-29.7	0.37	0.38	0.24	1.8	113	10	303.2	3	0	0	77	1013	0
6	6	1	152	9	87.8	0.331	-9	-9	-999	438	-37.4	0.37	0.38	0.2	2.3	127	10	304.5	3	0	0	65	1013	5
6	6	1	152	10	99.7	0.313	-9	-9	-999	402	-27.7	0.37	0.38	0.19	2.1	123	10	305.8	3	0	0	56	1013	7
6	6	1	152	11	106.9	0.282	-9	-9	-999	345	-19	0.37	0.38	0.18	1.8	110	10	306.9	3	0	0	56	1012	8
6	6	1	152	12	103.3	0.303	-9	-9	-999	383	-24.2	0.37	0.38	0.18	2	112	10	307	3	0	0	50	1011	8
6	6	1	152	13	100.8	0.302	-9	-9	-999	382	-24.6	0.37	0.38	0.18	2	111	10	307.1	3	0	0	44	1010	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	1	152	14	88	0.309	-9	-9	-999	396	-30.3	0.37	0.38	0.18	2.1	107	10	306.6	3	0	0	50	1010	9
6	6	1	152	15	66.1	0.313	-9	-9	-999	403	-41.8	0.37	0.38	0.19	2.2	109	10	305.9	3	0	0	47	1009	9
6	6	1	152	16	42.5	0.303	-9	-9	-999	383	-58.6	0.37	0.38	0.2	2.2	108	10	304.8	3	0	0	52	1010	9
6	6	1	152	17	10.3	0.258	-9	-9	-999	302	-150.9	0.37	0.38	0.23	2	114	10	302.9	3	0	0	61	1010	10
6	6	1	152	18	0.1	0.194	-9	-9	-999	198	-6628.8	0.37	0.38	0.37	1.6	106	10	301.2	3	0	0	67	1011	7
6	6	1	152	19	-3.1	0.067	-9	-9	-999	54	8.7	0.37	0.38	1	1.1	98	10	300.2	3	0	0	74	1011	7
6	6	1	152	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	299.6	3	0	0	77	1011	7
6	6	1	152	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	299.2	3	0	0	77	1012	7
6	6	1	152	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	299	3	0	0	88	1012	3
6	6	1	152	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	298.6	3	0	0	82	1012	7
6	6	1	152	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	100	10	298.8	3	0	0	88	1011	3
6	6	2	153	1	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	119	10	298.6	3	0	1.52	82	1011	3
6	6	2	153	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	111	10	297.9	3	0	8.89	91	1011	7
6	6	2	153	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	88	10	297.8	3	0	0	94	1011	7
6	6	2	153	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.9	3	0	0.25	94	1012	7
6	6	2	153	5	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	137	10	297.5	3	0	3.05	94	1012	7
6	6	2	153	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	297.5	3	0	1.02	94	1012	3
6	6	2	153	7	7.6	0.157	-9	-9	-999	143	-46	0.655	0.64	0.39	0.9	64	10	298.4	3	0	0	94	1013	8
6	6	2	153	8	34.3	0.209	-9	-9	-999	220	-24.1	0.655	0.64	0.23	1.1	76	10	298.9	3	0	0	94	1013	9
6	6	2	153	9	44.4	0.206	-9	-9	-999	215	-17.8	0.37	0.38	0.2	1.3	99	10	300.4	3	0	0	94	1014	9
6	6	2	153	10	86.8	0.287	-9	-9	-999	354	-24.6	0.37	0.38	0.19	1.9	106	10	301.8	3	0	0	88	1013	8
6	6	2	153	11	82.5	0.297	-9	-9	-999	372	-28.6	0.37	0.38	0.18	2	110	10	302.6	3	0	0	91	1013	9
6	6	2	153	12	23.8	0.237	-9	-9	-999	267	-50.7	0.37	0.38	0.18	1.7	113	10	300.1	3	0	0	82	1012	10
6	6	2	153	13	50.7	0.208	-9	-9	-999	219	-16.1	0.37	0.38	0.18	1.3	99	10	301.4	3	0	0	94	1012	10
6	6	2	153	14	47.4	0.262	-9	-9	-999	308	-34.1	0.37	0.38	0.18	1.8	102	10	302.8	3	0	0	77	1011	10
6	6	2	153	15	43.7	0.26	-9	-9	-999	305	-36.3	0.37	0.38	0.19	1.8	102	10	303.2	3	0	0	75	1011	10
6	6	2	153	16	14.1	0.196	-9	-9	-999	201	-48.3	0.37	0.38	0.2	1.4	92	10	301.9	3	0	0	70	1011	10
6	6	2	153	17	2.4	0.155	-9	-9	-999	141	-142.4	0.37	0.38	0.23	1.2	91	10	300.9	3	0	0	94	1011	10
6	6	2	153	18	0.1	0.11	-9	-9	-999	84	-1206.9	0.37	0.38	0.37	0.9	87	10	300	3	0	0	94	1011	7
6	6	2	153	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	102	10	299.5	3	0	0	94	1011	7
6	6	2	153	20	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	101	10	299.5	3	0	0	94	1012	7
6	6	2	153	21	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	107	10	299.5	3	0	0	94	1012	7
6	6	2	153	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	299.4	3	0	0	94	1012	7
6	6	2	153	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.9	3	0	0	97	1012	7
6	6	2	153	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	298.9	3	0	0	94	1011	7
6	6	3	154	1	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	107	10	298.8	3	0	0	94	1011	7
6	6	3	154	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	298.5	3	0	0	94	1010	7
6	6	3	154	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	298.4	3	0	0	94	1011	7
6	6	3	154	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	90	10	298	3	0	0	100	1011	7
6	6	3	154	5	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	66	10	297.8	3	0	0	97	1011	0
6	6	3	154	6	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	61	10	299.4	3	0	0	94	1012	3
6	6	3	154	7	31.6	0.194	0.937	0.005	940	197	-20.9	0.655	0.64	0.39	1	82	10	301.9	3	0	0	88	1013	0
6	6	3	154	8	54.4	0.265	1.148	0.005	1004	313	-30.8	0.37	0.38	0.24	1.8	106	10	302.9	3	0	0	82	1013	0
6	6	3	154	9	87.7	0.287	1.391	0.005	1109	354	-24.4	0.37	0.38	0.2	1.9	105	10	304.4	3	0	0	80	1013	5
6	6	3	154	10	110	0.337	1.555	0.005	1238	450	-31.5	0.37	0.38	0.19	2.3	130	10	303.6	3	0	0	66	1013	6
6	6	3	154	11	128.7	0.386	1.727	0.006	1446	551	-40.2	0.37	0.38	0.18	2.7	118	10	305.4	3	0	0	82	1013	6
6	6	3	154	12	133	0.365	1.797	0.006	1579	507	-32.9	0.37	0.38	0.18	2.5	102	10	306.4	3	0	0	66	1012	6
6	6	3	154	13	109.2	0.348	1.701	0.006	1629	472	-34.8	0.37	0.38	0.18	2.4	106	10	306.2	3	0	0	66	1011	8
6	6	3	154	14	85.1	0.33	1.577	0.006	1662	437	-38.2	0.37	0.38	0.18	2.3	113	10	305.8	3	0	0	61	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	3	154	15	78.4	0.339	1.544	0.006	1692	454	-44.8	0.37	0.38	0.19	2.4	98	10	305.4	3	0	0	61	1010	8
6	6	3	154	16	38.6	0.312	1.222	0.006	1704	400	-70.5	0.37	0.38	0.2	2.3	104	10	304.2	3	0	0	61	1010	9
6	6	3	154	17	12.7	0.261	0.843	0.006	1707	307	-126	0.37	0.38	0.23	2	100	10	302.9	3	0	0	65	1010	10
6	6	3	154	18	0.1	0.17	0.168	0.006	1705	164	-4450.8	0.37	0.38	0.37	1.4	91	10	301.2	3	0	0	70	1010	7
6	6	3	154	19	-3.4	0.073	-9	-9	-999	50	10.5	0.655	0.64	1	1	80	10	300.2	3	0	0	79	1011	7
6	6	3	154	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	79	10	299.5	3	0	0	85	1012	0
6	6	3	154	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	48	10	299	3	0	0	88	1013	3
6	6	3	154	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	298.9	3	0	0	82	1013	3
6	6	3	154	23	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	83	10	298.5	3	0	0	88	1013	3
6	6	3	154	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	32	10	298.2	3	0	0	94	1012	3
6	6	4	155	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	52	10	298.1	3	0	0	94	1011	3
6	6	4	155	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	52	10	298.1	3	0	0	94	1011	3
6	6	4	155	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	298	3	0	0	94	1011	3
6	6	4	155	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	62	10	297.6	3	0	0	100	1011	3
6	6	4	155	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	50	10	297.8	3	0	0	97	1011	3
6	6	4	155	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	61	10	299.2	3	0	0	100	1012	7
6	6	4	155	7	34.2	0.222	-9	-9	-999	241	-29	0.655	0.64	0.39	1.2	63	10	301.9	3	0	0	88	1012	0
6	6	4	155	8	90.6	0.338	-9	-9	-999	453	-38.6	0.655	0.64	0.23	1.9	84	10	303.2	3	0	0	77	1013	0
6	6	4	155	9	99.7	0.316	-9	-9	-999	408	-28.5	0.655	0.64	0.19	1.7	77	10	304.4	3	0	0	65	1013	7
6	6	4	155	10	91.9	0.3	-9	-9	-999	377	-26.4	0.37	0.38	0.19	2	88	10	305.2	3	0	0	61	1012	7
6	6	4	155	11	61.9	0.322	-9	-9	-999	420	-48.7	0.37	0.38	0.18	2.3	97	10	301.5	3	0	0	58	1012	9
6	6	4	155	12	63.2	0.29	-9	-9	-999	360	-34.8	0.37	0.38	0.18	2	90	10	301.4	3	0	0	85	1012	9
6	6	4	155	13	149.7	0.329	-9	-9	-999	433	-21.4	0.655	0.64	0.18	1.7	81	10	303.1	3	0	0	88	1011	8
6	6	4	155	14	59.4	0.3	-9	-9	-999	377	-40.8	0.37	0.38	0.18	2.1	102	10	301.4	3	0	1.78	77	1010	9
6	6	4	155	15	54.9	0.319	-9	-9	-999	415	-53.4	0.37	0.38	0.19	2.3	96	10	303.2	3	0	0	70	1009	9
6	6	4	155	16	25.5	0.293	-9	-9	-999	365	-88.8	0.37	0.38	0.2	2.2	99	10	302.4	3	0	0	85	1010	10
6	6	4	155	17	7.4	0.243	-9	-9	-999	277	-174.9	0.37	0.38	0.23	1.9	100	10	301.6	3	0	0	85	1010	10
6	6	4	155	18	0.1	0.194	-9	-9	-999	198	-6624.4	0.37	0.38	0.36	1.6	91	10	300.6	3	0	0	85	1010	7
6	6	4	155	19	-5.7	0.091	-9	-9	-999	68	11.9	0.37	0.38	1	1.5	105	10	300.2	3	0	0	82	1010	7
6	6	4	155	20	-5	0.085	-9	-9	-999	57	11.1	0.37	0.38	1	1.4	111	10	299.6	3	0	0	85	1011	7
6	6	4	155	21	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	94	10	299.1	3	0	0	94	1011	7
6	6	4	155	22	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	88	10	298.5	3	0	0	94	1012	7
6	6	4	155	23	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	94	10	298.4	3	0	0	91	1011	7
6	6	4	155	24	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	103	10	298.8	3	0	0	88	1010	7
6	6	5	156	1	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	94	10	298.9	3	0	0	88	1010	7
6	6	5	156	2	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	109	10	298.8	3	0	0	94	1010	7
6	6	5	156	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	110	10	298.6	3	0	0	94	1010	7
6	6	5	156	4	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	104	10	298.4	3	0	0	94	1010	99
6	6	5	156	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	107	10	298.2	3	0	0	94	1011	7
6	6	5	156	6	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	124	10	299	3	0	0	92	1011	7
6	6	5	156	7	21.3	0.224	0.482	0.005	189	245	-47.9	0.37	0.38	0.4	1.6	117	10	300.9	3	0	0	90	1012	0
6	6	5	156	8	56.7	0.331	0.769	0.005	289	438	-57.7	0.37	0.38	0.24	2.4	126	10	302.6	3	0	0	88	1012	0
6	6	5	156	9	93.3	0.355	1.054	0.005	454	485	-43.1	0.37	0.38	0.2	2.5	124	10	303.9	3	0	0	75	1013	0
6	6	5	156	10	80.3	0.35	1.099	0.005	596	477	-48.4	0.37	0.38	0.19	2.5	118	10	304.2	3	0	0	66	1012	8
6	6	5	156	11	104.6	0.358	1.344	0.005	839	492	-39.5	0.37	0.38	0.18	2.5	120	10	304.5	3	0	0	66	1012	8
6	6	5	156	12	108.8	0.402	1.482	0.005	1082	586	-54	0.37	0.38	0.18	2.9	131	10	305.2	3	0	0	85	1011	8
6	6	5	156	13	107.6	0.412	1.58	0.007	1322	609	-58.8	0.37	0.38	0.18	3	125	10	305.4	3	0	0	75	1010	8
6	6	5	156	14	73.1	0.359	1.407	0.007	1373	496	-56.9	0.37	0.38	0.18	2.6	122	10	304.2	3	0	0	66	1010	9
6	6	5	156	15	55.6	0.32	1.291	0.007	1394	416	-52.9	0.37	0.38	0.19	2.3	126	10	301.9	3	0	0	70	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	5	156	16	28	0.328	1.03	0.007	1406	432	-113.5	0.37	0.38	0.2	2.5	126	10	302.2	3	0	0	88	1009	10
6	6	5	156	17	6.1	0.208	0.62	0.007	1407	225	-132.8	0.37	0.38	0.23	1.6	113	10	301.2	3	0	0	88	1010	10
6	6	5	156	18	0.1	0.158	0.158	0.007	1406	145	-3569.2	0.37	0.38	0.36	1.3	101	10	300	3	0	0	88	1010	7
6	6	5	156	19	-2.5	0.061	-9	-9	-999	40	7.9	0.37	0.38	1	1	99	10	299.4	3	0	0	88	1010	7
6	6	5	156	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	49	10	299.1	3	0	0	94	1011	0
6	6	5	156	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	298.9	3	0	0	94	1011	3
6	6	5	156	22	-4.8	0.079	-9	-9	-999	51	9.1	0.37	0.38	1	1.3	108	10	299.1	3	0	0	94	1012	3
6	6	5	156	23	-3.5	0.067	-9	-9	-999	40	7.6	0.37	0.38	1	1.1	103	10	299.4	3	0	0	94	1012	0
6	6	5	156	24	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	112	10	299.5	3	0	0	94	1011	7
6	6	6	157	1	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	108	10	299.2	3	0	0	88	1011	7
6	6	6	157	2	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	100	10	299.1	3	0	0	94	1010	7
6	6	6	157	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	105	10	298.8	3	0	0	94	1010	7
6	6	6	157	4	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	82	10	298.5	3	0	0	94	1011	7
6	6	6	157	5	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	100	10	298.5	3	0	0	94	1011	7
6	6	6	157	6	-5.7	0.091	-9	-9	-999	63	11.9	0.37	0.38	1	1.5	119	10	298.2	3	0	12.7	94	1012	7
6	6	6	157	7	1.1	0.209	0.099	0.005	31	220	-737.9	0.37	0.38	0.4	1.7	102	10	297.6	3	0	1.27	94	1013	10
6	6	6	157	8	15.7	0.209	0.477	0.005	251	219	-52.4	0.37	0.38	0.24	1.5	93	10	298.8	3	0	0	88	1013	10
6	6	6	157	9	29.4	0.208	0.802	0.005	634	219	-27.8	0.37	0.38	0.2	1.4	88	10	299.6	3	0	0	94	1014	10
6	6	6	157	10	65.5	0.248	1.161	0.005	864	283	-20.9	0.37	0.38	0.19	1.6	101	10	301.5	3	0	0	79	1013	9
6	6	6	157	11	53.3	0.286	1.115	0.005	939	352	-39.7	0.37	0.38	0.18	2	123	10	301.9	3	0	0.51	72	1013	10
6	6	6	157	12	40.8	0.291	1.036	0.006	984	361	-54.5	0.37	0.38	0.18	2.1	116	10	301.9	3	0	0	66	1013	10
6	6	6	157	13	74.2	0.316	1.284	0.006	1031	408	-38.4	0.37	0.38	0.18	2.2	120	10	303.6	3	0	0	61	1012	9
6	6	6	157	14	87	0.353	1.377	0.006	1085	481	-45.4	0.37	0.38	0.18	2.5	115	10	304.4	3	0	0	65	1011	9
6	6	6	157	15	56.4	0.341	1.205	0.006	1119	459	-63.6	0.37	0.38	0.19	2.5	116	10	303.9	3	0	0	66	1011	9
6	6	6	157	16	27.9	0.294	0.957	0.006	1134	368	-82.6	0.37	0.38	0.2	2.2	114	10	302	3	0	0	70	1011	10
6	6	6	157	17	4.9	0.24	0.538	0.006	1136	271	-252.3	0.37	0.38	0.23	1.9	102	10	301.4	3	0	0	72	1012	10
6	6	6	157	18	0.1	0.194	0.147	0.006	1136	198	-6633.2	0.37	0.38	0.36	1.6	110	10	300.5	3	0	0	70	1012	7
6	6	6	157	19	-5	0.085	-9	-9	-999	63	11.1	0.37	0.38	1	1.4	107	10	299.9	3	0	0	77	1012	7
6	6	6	157	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	299.9	3	0	0	79	1013	7
6	6	6	157	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	299.5	3	0	0	77	1013	7
6	6	6	157	22	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	55	10	298.9	3	0	0	77	1013	7
6	6	6	157	23	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	54	10	298.5	3	0	0	85	1013	7
6	6	6	157	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	298.4	3	0	0	88	1012	7
6	6	7	158	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	298.2	3	0	0	88	1012	7
6	6	7	158	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	298	3	0	0	94	1012	7
6	6	7	158	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	83	10	297.9	3	0	0	88	1011	7
6	6	7	158	4	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	297.9	3	0	0	88	1012	7
6	6	7	158	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	297.5	3	0	0	91	1012	7
6	6	7	158	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	102	10	299.2	3	0	0	94	1013	3
6	6	7	158	7	11.3	0.215	-9	-9	-999	229	-79.1	0.37	0.38	0.4	1.6	110	10	301.5	3	0	0	94	1014	0
6	6	7	158	8	46.2	0.239	-9	-9	-999	269	-26.8	0.37	0.38	0.24	1.6	111	10	300.6	3	0	0.51	85	1014	6
6	6	7	158	9	77.3	0.284	-9	-9	-999	348	-26.8	0.37	0.38	0.2	1.9	111	10	302.8	3	0	0.25	88	1014	7
6	6	7	158	10	97.2	0.312	-9	-9	-999	401	-28.2	0.37	0.38	0.19	2.1	117	10	302.9	3	0	0	75	1014	7
6	6	7	158	11	106.8	0.358	-9	-9	-999	493	-38.9	0.37	0.38	0.18	2.5	121	10	304	3	0	0	91	1013	7
6	6	7	158	12	86.9	0.32	-9	-9	-999	417	-34	0.37	0.38	0.18	2.2	99	10	304	3	0	0	82	1012	9
6	6	7	158	13	104.7	0.369	-9	-9	-999	515	-43.1	0.37	0.38	0.18	2.6	112	10	304.6	3	0	0	66	1011	8
6	6	7	158	14	77.1	0.349	-9	-9	-999	475	-49.8	0.37	0.38	0.18	2.5	112	10	304.8	3	0	0	80	1010	9
6	6	7	158	15	70.5	0.358	-9	-9	-999	492	-58.4	0.37	0.38	0.19	2.6	100	10	304.5	3	0	0	66	1010	9
6	6	7	158	16	40.6	0.323	-9	-9	-999	424	-75.1	0.37	0.38	0.2	2.4	100	10	302.9	3	0	0	85	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	7	158	17	12.4	0.238	-9	-9	-999	270	-97.8	0.37	0.38	0.23	1.8	98	10	302.2	3	0	0	77	1010	10
6	6	7	158	18	0.1	0.194	-9	-9	-999	198	-6626.6	0.37	0.38	0.36	1.6	88	10	299.9	3	0	0	88	1010	3
6	6	7	158	19	-2.9	0.061	-9	-9	-999	52	7	0.37	0.38	1	1	95	10	298.9	3	0	0	88	1011	3
6	6	7	158	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	89	10	298.9	3	0	0	94	1012	3
6	6	7	158	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	89	10	298.9	3	0	0	88	1012	3
6	6	7	158	22	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	74	10	298.9	3	0	0	94	1013	3
6	6	7	158	23	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	76	10	298.8	3	0	0	91	1013	3
6	6	7	158	24	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	71	10	298.5	3	0	0	88	1012	3
6	6	8	159	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	75	10	298.5	3	0	0	88	1012	7
6	6	8	159	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	298.2	3	0	0	94	1011	3
6	6	8	159	3	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	84	10	298.2	3	0	0	94	1011	3
6	6	8	159	4	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	67	10	297.8	3	0	0	94	1011	7
6	6	8	159	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	297.2	3	0	0	94	1011	7
6	6	8	159	6	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	83	10	298.4	3	0	0	94	1012	3
6	6	8	159	7	32.3	0.234	0.626	0.005	273	260	-35.7	0.655	0.64	0.4	1.3	85	10	301.2	3	0	0	88	1012	0
6	6	8	159	8	50.8	0.296	0.9	0.005	518	370	-46	0.37	0.38	0.24	2.1	96	10	302.8	3	0	0	80	1012	0
6	6	8	159	9	98.3	0.367	1.315	0.006	835	511	-45.3	0.37	0.38	0.2	2.6	97	10	304.4	3	0	0	75	1013	0
6	6	8	159	10	110.5	0.381	1.412	0.005	922	541	-45.2	0.37	0.38	0.19	2.7	112	10	304.8	3	0	0	70	1013	6
6	6	8	159	11	122.1	0.351	1.509	0.005	1016	479	-32	0.37	0.38	0.18	2.4	102	10	304.6	3	0	0	68	1012	6
6	6	8	159	12	113.7	0.371	1.499	0.005	1071	520	-40.5	0.37	0.38	0.18	2.6	101	10	305	3	0	0	66	1012	8
6	6	8	159	13	104.8	0.369	1.478	0.005	1111	515	-43.1	0.37	0.38	0.18	2.6	106	10	304.9	3	0	0	85	1010	8
6	6	8	159	14	94.9	0.344	1.446	0.005	1147	465	-38.7	0.37	0.38	0.18	2.4	102	10	305.4	3	0	0	75	1009	8
6	6	8	159	15	66.7	0.324	1.295	0.005	1172	425	-45.9	0.37	0.38	0.19	2.3	95	10	304.4	3	0	0	72	1009	9
6	6	8	159	16	35.5	0.288	1.053	0.005	1183	356	-60.5	0.37	0.38	0.2	2.1	108	10	302.5	3	0	0.51	69	1009	10
6	6	8	159	17	16.7	0.231	0.821	0.005	1188	257	-66.6	0.37	0.38	0.23	1.7	105	10	301	3	0	0	67	1009	10
6	6	8	159	18	0.1	0.158	0.149	0.005	1187	146	-3568	0.37	0.38	0.36	1.3	112	10	300.2	3	0	0	75	1010	7
6	6	8	159	19	-3.7	0.073	-9	-9	-999	48	9.5	0.37	0.38	1	1.2	102	10	299.8	3	0	0	79	1010	7
6	6	8	159	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	96	10	299.8	3	0	0	85	1011	7
6	6	8	159	21	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	107	10	299.4	3	0	0	82	1012	7
6	6	8	159	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	298.9	3	0	0	82	1012	7
6	6	8	159	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	299	3	0	0	88	1012	7
6	6	8	159	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	298.9	3	0	0	88	1011	7
6	6	9	160	1	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	87	10	298.6	3	0	0	88	1010	7
6	6	9	160	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	298.4	3	0	0	88	1010	7
6	6	9	160	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	72	10	297.9	3	0	0	88	1010	7
6	6	9	160	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	297.6	3	0	0	82	1010	7
6	6	9	160	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	102	10	297.5	3	0	0	88	1011	0
6	6	9	160	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	62	10	298.8	3	0	0	88	1012	7
6	6	9	160	7	35.1	0.223	0.82	0.005	568	242	-28.5	0.655	0.64	0.4	1.2	84	10	301.5	3	0	0	82	1013	0
6	6	9	160	8	62.7	0.29	1.111	0.005	789	359	-35.2	0.37	0.38	0.24	2	98	10	303.2	3	0	0	79	1013	0
6	6	9	160	9	88.8	0.364	1.286	0.005	865	505	-49	0.37	0.38	0.2	2.6	115	10	304.4	3	0	0	70	1013	4
6	6	9	160	10	91.9	0.354	1.34	0.005	948	485	-43.7	0.37	0.38	0.19	2.5	110	10	304.9	3	0	0	61	1013	8
6	6	9	160	11	90.9	0.354	1.373	0.005	1029	484	-44	0.37	0.38	0.18	2.5	115	10	304.9	3	0	0	59	1013	8
6	6	9	160	12	107.6	0.348	1.493	0.005	1117	472	-35.3	0.37	0.38	0.18	2.4	100	10	305.5	3	0	0	58	1012	8
6	6	9	160	13	116.5	0.372	1.567	0.005	1192	521	-39.8	0.37	0.38	0.18	2.6	103	10	305.8	3	0	0	65	1011	7
6	6	9	160	14	96.2	0.388	1.502	0.005	1271	555	-54.7	0.37	0.38	0.18	2.8	97	10	305.4	3	0	0	59	1010	8
6	6	9	160	15	65.5	0.367	1.354	0.005	1365	511	-67.8	0.37	0.38	0.19	2.7	99	10	304.5	3	0	0	61	1010	9
6	6	9	160	16	32.2	0.308	1.081	0.005	1409	395	-81.6	0.37	0.38	0.2	2.3	97	10	303.6	3	0	0	61	1010	10
6	6	9	160	17	9	0.279	0.707	0.005	1418	340	-219	0.37	0.38	0.23	2.2	90	10	302.4	3	0	0	67	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	9	160	18	0.1	0.207	0.158	0.005	1412	217	-7944.1	0.37	0.38	0.36	1.7	94	10	301.2	3	0	0	70	1011	7
6	6	9	160	19	-3.7	0.073	-9	-9	-999	61	9.5	0.37	0.38	1	1.2	86	10	300.4	3	0	0	74	1012	7
6	6	9	160	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	91	10	299.8	3	0	0	79	1012	7
6	6	9	160	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	299.2	3	0	0	77	1013	7
6	6	9	160	22	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	80	10	299	3	0	0	88	1013	7
6	6	9	160	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	298.8	3	0	0	88	1012	7
6	6	9	160	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	81	10	298.4	3	0	0	88	1012	7
6	6	10	161	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	83	10	298.2	3	0	0	88	1011	7
6	6	10	161	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	298	3	0	0	88	1011	7
6	6	10	161	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	62	10	297.9	3	0	0	94	1010	7
6	6	10	161	4	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	65	10	297.8	3	0	0	94	1010	7
6	6	10	161	5	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	65	10	297.6	3	0	0	91	1011	7
6	6	10	161	6	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	68	10	298.5	3	0	0	94	1012	7
6	6	10	161	7	21.4	0.239	0.828	0.006	954	268	-57.3	0.655	0.64	0.4	1.4	78	10	300.9	3	0	0	82	1012	0
6	6	10	161	8	71.4	0.293	1.253	0.006	995	364	-31.7	0.655	0.64	0.23	1.6	85	10	302.5	3	0	0	72	1013	0
6	6	10	161	9	77.8	0.284	1.308	0.005	1040	349	-26.7	0.37	0.38	0.2	1.9	99	10	304	3	0	0	65	1013	7
6	6	10	161	10	90.5	0.332	1.398	0.005	1092	440	-36.6	0.37	0.38	0.19	2.3	115	10	304.5	3	0	0	59	1013	8
6	6	10	161	11	77	0.317	1.343	0.005	1137	410	-37.3	0.37	0.38	0.18	2.2	116	10	304.5	3	0	0	56	1013	9
6	6	10	161	12	84.6	0.33	1.405	0.005	1185	436	-38.4	0.37	0.38	0.18	2.3	102	10	304.5	3	0	0	59	1012	9
6	6	10	161	13	121.2	0.373	1.615	0.005	1256	524	-38.6	0.37	0.38	0.18	2.6	96	10	305	3	0	0	59	1012	7
6	6	10	161	14	107.2	0.38	1.576	0.005	1317	539	-46.2	0.37	0.38	0.18	2.7	104	10	304.8	3	0	0	63	1011	8
6	6	10	161	15	53.9	0.34	1.263	0.005	1347	458	-65.9	0.37	0.38	0.19	2.5	103	10	303.9	3	0	0	61	1010	9
6	6	10	161	16	23.2	0.28	0.957	0.005	1359	343	-85.6	0.37	0.38	0.2	2.1	109	10	302.8	3	0	0	59	1010	10
6	6	10	161	17	11.1	0.27	0.75	0.005	1365	323	-159.7	0.37	0.38	0.23	2.1	106	10	301.9	3	0	0	65	1010	10
6	6	10	161	18	0.1	0.207	0.156	0.005	1363	217	-7944.1	0.37	0.38	0.36	1.7	112	10	300.8	3	0	0	70	1011	7
6	6	10	161	19	-3.7	0.073	-9	-9	-999	61	9.5	0.37	0.38	1	1.2	103	10	300	3	0	0	82	1012	7
6	6	10	161	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	99	10	299.5	3	0	0	85	1012	7
6	6	10	161	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	299.2	3	0	0	88	1013	7
6	6	10	161	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	298.9	3	0	0	88	1013	7
6	6	10	161	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	298.9	3	0	0	88	1012	7
6	6	10	161	24	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	63	10	298.4	3	0	0	88	1012	7
6	6	11	162	1	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	41	10	298.1	3	0	0	88	1011	7
6	6	11	162	2	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	54	10	297.9	3	0	0	91	1011	7
6	6	11	162	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	60	10	297.5	3	0	0	94	1011	7
6	6	11	162	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.4	3	0	0	94	1011	7
6	6	11	162	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	65	10	297	3	0	0	94	1012	7
6	6	11	162	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	90	10	298.8	3	0	0	94	1012	7
6	6	11	162	7	17.6	0.156	0.683	0.005	653	142	-19.6	0.37	0.38	0.41	1	94	10	301.4	3	0	0	88	1013	0
6	6	11	162	8	49	0.244	0.985	0.005	705	277	-26.7	0.655	0.64	0.23	1.3	81	10	301.8	3	0	1.02	77	1014	8
6	6	11	162	9	86.8	0.221	1.242	0.005	798	239	-11.3	0.37	0.38	0.2	1.3	102	10	302.4	3	0	0	70	1014	4
6	6	11	162	10	102.5	0.247	1.386	0.005	941	283	-13.4	0.37	0.38	0.19	1.5	97	10	303.4	3	0	0	75	1014	7
6	6	11	162	11	122.3	0.297	1.556	0.005	1115	372	-19.4	0.37	0.38	0.18	1.9	98	10	305.1	3	0	0	61	1014	6
6	6	11	162	12	119.1	0.329	1.617	0.005	1284	433	-26.9	0.37	0.38	0.18	2.2	95	10	305.9	3	0	0	56	1013	7
6	6	11	162	13	96.9	0.334	1.541	0.005	1365	443	-34.6	0.37	0.38	0.18	2.3	119	10	304	3	0	0	56	1013	8
6	6	11	162	14	94.8	0.29	1.544	0.005	1404	360	-23.2	0.37	0.38	0.18	1.9	117	10	305	3	0	0	54	1012	8
6	6	11	162	15	74.5	0.316	1.436	0.005	1434	409	-38.2	0.37	0.38	0.19	2.2	109	10	304.9	3	0	0	54	1011	9
6	6	11	162	16	42.3	0.302	1.194	0.005	1451	383	-58.9	0.37	0.38	0.2	2.2	101	10	304.1	3	0	0	56	1010	9
6	6	11	162	17	11.5	0.226	0.774	0.005	1454	249	-90.6	0.37	0.38	0.23	1.7	101	10	302.9	3	0	0	63	1010	10
6	6	11	162	18	0.1	0.17	0.159	0.005	1452	162	-4452.3	0.37	0.38	0.36	1.4	96	10	301.1	3	0	0	67	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	11	162	19	-2.9	0.061	-9	-9	-999	43	7	0.37	0.38	1	1	86	10	300	3	0	0	79	1012	3
6	6	11	162	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	93	10	299.4	3	0	0	82	1013	0
6	6	11	162	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	113	10	298.9	3	0	0	82	1013	3
6	6	11	162	22	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	100	10	298.6	3	0	0	82	1013	3
6	6	11	162	23	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	65	10	298.2	3	0	0	88	1013	0
6	6	11	162	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.1	3	0	0	88	1012	7
6	6	12	163	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	46	10	297.9	3	0	0	94	1012	3
6	6	12	163	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	297.9	3	0	0	91	1011	3
6	6	12	163	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	298	3	0	0	94	1011	3
6	6	12	163	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.8	3	0	0	100	1012	3
6	6	12	163	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	70	10	297.4	3	0	0	94	1012	7
6	6	12	163	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	58	10	298.1	3	0	0	100	1013	7
6	6	12	163	7	27.9	0.192	0.863	0.005	830	193	-22.7	0.655	0.64	0.4	1	64	10	300.9	3	0	0	88	1013	0
6	6	12	163	8	73.1	0.254	1.26	0.005	990	294	-20.1	0.655	0.64	0.23	1.3	71	10	302.6	3	0	0	72	1014	0
6	6	12	163	9	87.9	0.312	1.42	0.005	1180	400	-31.1	0.655	0.64	0.19	1.7	74	10	302.2	3	0	0	72	1014	8
6	6	12	163	10	163.1	0.331	1.837	0.005	1375	439	-20.2	0.655	0.64	0.18	1.7	73	10	302.9	3	0	0	75	1013	5
6	6	12	163	11	168.5	0.333	1.927	0.005	1537	441	-19.7	0.655	0.64	0.18	1.7	72	10	304.6	3	0	0	70	1013	7
6	6	12	163	12	198.9	0.379	2.1	0.005	1684	537	-24.7	0.655	0.64	0.18	2	79	10	304	3	0	0	70	1012	6
6	6	12	163	13	68.4	0.325	1.485	0.005	1731	427	-45.1	0.37	0.38	0.18	2.3	94	10	301.8	3	0	1.02	66	1012	9
6	6	12	163	14	96.4	0.323	1.689	0.006	1804	422	-31.4	0.37	0.38	0.18	2.2	98	10	302.9	3	0	0	67	1011	8
6	6	12	163	15	13.2	0.239	0.872	0.006	1813	271	-93.2	0.37	0.38	0.19	1.8	93	10	302.1	3	0	0	61	1010	10
6	6	12	163	16	10.3	0.214	0.804	0.006	1819	227	-85.3	0.37	0.38	0.2	1.6	104	10	301.5	3	0	0	63	1010	10
6	6	12	163	17	2.3	0.178	0.492	0.006	1819	173	-215.7	0.37	0.38	0.23	1.4	104	10	300.8	3	0	0	67	1010	10
6	6	12	163	18	0.1	0.162	0.172	0.006	1817	150	-3830.7	0.655	0.64	0.35	1.1	85	10	299.9	3	0	0	74	1010	7
6	6	12	163	19	-2.7	0.066	-9	-9	-999	44	9.5	0.655	0.64	1	0.9	81	10	299.1	3	0	0	77	1011	7
6	6	12	163	20	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	78	10	298.6	3	0	0	91	1012	3
6	6	12	163	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	298.2	3	0	0	88	1012	3
6	6	12	163	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	101	10	298.1	3	0	0	94	1013	3
6	6	12	163	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	93	10	297.9	3	0	0	94	1012	0
6	6	12	163	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	66	10	297.9	3	0	0	94	1012	3
6	6	13	164	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	72	10	297.5	3	0	0	94	1011	3
6	6	13	164	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	119	10	297.5	3	0	0	94	1011	7
6	6	13	164	3	-1.8	0.054	-9	-9	-999	29	7.8	0.736	0.77	1	0.7	142	10	297.5	3	0	0.76	100	1010	7
6	6	13	164	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	297.5	3	0	0	94	1011	7
6	6	13	164	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	78	10	297.4	3	0	0	100	1011	7
6	6	13	164	6	9	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	3	0	0	94	1012	3
6	6	13	164	7	18.8	0.112	0.461	0.005	188	86	-6.7	0.37	0.38	0.41	0.6	109	10	299.9	3	0	0	100	1012	0
6	6	13	164	8	90.7	0.297	1.102	0.005	533	372	-26.1	0.736	0.77	0.23	1.5	146	10	302.4	3	0	0	94	1013	0
6	6	13	164	9	62.3	0.299	1.098	0.005	768	376	-38.9	0.736	0.77	0.19	1.6	144	10	302.2	3	0	2.54	88	1013	9
6	6	13	164	10	80.3	0.285	1.243	0.005	865	350	-26	0.37	0.38	0.19	1.9	118	10	301.2	3	0	0.51	88	1013	8
6	6	13	164	11	26.3	0.228	0.865	0.005	888	252	-40.8	0.37	0.38	0.19	1.6	128	10	300.1	3	0	4.57	80	1013	10
6	6	13	164	12	84.5	0.417	1.312	0.005	967	619	-77.4	0.736	0.77	0.17	2.4	153	10	300.4	3	0	0	88	1013	10
6	6	13	164	13	145.9	0.354	1.646	0.005	1106	486	-27.4	0.736	0.77	0.17	1.8	141	10	302.2	3	0	0	94	1012	8
6	6	13	164	14	62.4	0.246	1.263	0.005	1165	287	-21.6	0.37	0.38	0.18	1.6	109	10	302.8	3	0	0	91	1013	9
6	6	13	164	15	59.7	0.267	1.263	0.005	1221	317	-28.7	0.37	0.38	0.19	1.8	93	10	302.5	3	0	0	88	1012	9
6	6	13	164	16	41.3	0.237	1.129	0.005	1258	265	-29	0.37	0.38	0.2	1.6	88	10	301.5	3	0	0	94	1012	9
6	6	13	164	17	10.7	0.236	0.721	0.005	1266	264	-111.4	0.37	0.38	0.23	1.8	94	10	300.8	3	0	0	85	1012	10
6	6	13	164	18	0.1	0.158	0.152	0.005	1263	146	-3576.3	0.37	0.38	0.36	1.3	99	10	299.4	3	0	0	94	1012	7
6	6	13	164	19	-2.5	0.061	-9	-9	-999	40	7.9	0.37	0.38	1	1	101	10	298.9	3	0	0	88	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	13	164	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	298.5	3	0	0	91	1014	7
6	6	13	164	21	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	85	10	298.2	3	0	0	88	1015	7
6	6	13	164	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	298	3	0	0	94	1015	7
6	6	13	164	23	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	100	10	297.9	3	0	0	94	1015	7
6	6	13	164	24	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	92	10	297.5	3	0	0	94	1014	7
6	6	14	165	1	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	99	10	297.4	3	0	0	94	1013	7
6	6	14	165	2	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	105	10	297.8	3	0	0	94	1013	7
6	6	14	165	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	93	10	298.2	3	0	0	94	1013	3
6	6	14	165	4	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	45	10	297.5	3	0	0	94	1013	7
6	6	14	165	5	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	46	10	297	3	0	0	94	1013	7
6	6	14	165	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	115	10	298.4	3	0	0	94	1014	7
6	6	14	165	7	23.7	0.226	0.564	0.005	273	248	-44.1	0.37	0.38	0.41	1.6	107	10	301.2	3	0	0	88	1014	0
6	6	14	165	8	48.7	0.273	0.864	0.005	480	328	-37.9	0.37	0.38	0.24	1.9	105	10	302.4	3	0	0	82	1014	3
6	6	14	165	9	81.1	0.34	1.223	0.005	817	456	-43.8	0.37	0.38	0.2	2.4	103	10	303.4	3	0	0	75	1014	6
6	6	14	165	10	97.3	0.366	1.362	0.005	939	510	-45.7	0.37	0.38	0.19	2.6	94	10	303.2	3	0	0	75	1014	7
6	6	14	165	11	123.4	0.384	1.551	0.005	1095	548	-41.6	0.37	0.38	0.19	2.7	95	10	304.8	3	0	0	77	1014	6
6	6	14	165	12	122.4	0.384	1.617	0.005	1250	548	-41.8	0.37	0.38	0.18	2.7	100	10	305	3	0	0	65	1013	7
6	6	14	165	13	85.9	0.331	1.473	0.005	1345	439	-38	0.37	0.38	0.18	2.3	110	10	304.8	3	0	0	61	1013	9
6	6	14	165	14	66.9	0.346	1.379	0.005	1417	467	-55.8	0.37	0.38	0.18	2.5	108	10	304.4	3	0	0	61	1013	9
6	6	14	165	15	69.1	0.325	1.418	0.007	1492	426	-44.8	0.37	0.38	0.19	2.3	93	10	304	3	0	0	65	1012	9
6	6	14	165	16	42	0.313	1.217	0.01	1553	403	-66	0.37	0.38	0.19	2.3	91	10	303.4	3	0	0	65	1012	9
6	6	14	165	17	8.8	0.223	0.725	0.01	1558	245	-113.5	0.37	0.38	0.23	1.7	95	10	302	3	0	0	67	1012	10
6	6	14	165	18	0.1	0.146	0.163	0.01	1555	130	-2818.9	0.37	0.38	0.36	1.2	94	10	300.5	3	0	0	74	1012	7
6	6	14	165	19	-2.1	0.055	-9	-9	-999	34	7.1	0.37	0.38	1	0.9	88	10	299.6	3	0	0	82	1012	7
6	6	14	165	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	299.2	3	0	0	85	1013	7
6	6	14	165	21	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	74	10	299.1	3	0	0	88	1013	7
6	6	14	165	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	298.6	3	0	0	88	1014	7
6	6	14	165	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	99	10	298.4	3	0	0	94	1014	7
6	6	14	165	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	105	10	297.8	3	0	0	88	1013	7
6	6	15	166	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	109	10	297.4	3	0	0	88	1012	7
6	6	15	166	2	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	60	10	297.1	3	0	0	94	1012	7
6	6	15	166	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	68	10	297.1	3	0	0	94	1012	7
6	6	15	166	4	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	63	10	297	3	0	0	94	1012	7
6	6	15	166	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	66	10	296.9	3	0	0	97	1012	7
6	6	15	166	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	55	10	298.2	3	0	0	100	1013	7
6	6	15	166	7	29.2	0.166	0.815	0.005	670	155	-14.1	0.655	0.64	0.4	0.8	73	10	301.2	3	0	0	100	1013	0
6	6	15	166	8	58.9	0.223	1.066	0.005	745	242	-17	0.37	0.38	0.24	1.4	88	10	302.9	3	0	0	74	1013	0
6	6	15	166	9	87.4	0.255	1.266	0.005	840	296	-17.1	0.37	0.38	0.2	1.6	88	10	304	3	0	0	70	1014	4
6	6	15	166	10	101.8	0.259	1.375	0.005	924	302	-15.3	0.37	0.38	0.19	1.6	86	10	304.9	3	0	0	63	1014	7
6	6	15	166	11	134.1	0.277	1.573	0.005	1050	336	-14.4	0.37	0.38	0.19	1.7	97	10	306.2	3	0	0	59	1013	5
6	6	15	166	12	99	0.258	1.464	0.005	1146	301	-15.6	0.37	0.38	0.18	1.6	107	10	306	3	0	0	56	1013	8
6	6	15	166	13	159	0.317	1.789	0.005	1303	411	-18.1	0.655	0.64	0.18	1.6	84	10	306.4	3	0	0	56	1012	8
6	6	15	166	14	100.4	0.27	1.573	0.005	1401	323	-17.6	0.37	0.38	0.18	1.7	96	10	306.4	3	0	0	54	1012	8
6	6	15	166	15	79.9	0.263	1.484	0.005	1478	311	-20.6	0.37	0.38	0.19	1.7	98	10	306	3	0	0	55	1011	8
6	6	15	166	16	41.3	0.27	1.201	0.005	1514	322	-42.8	0.37	0.38	0.19	1.9	105	10	304.5	3	0	0	59	1011	9
6	6	15	166	17	15.1	0.219	0.862	0.005	1525	236	-62.5	0.37	0.38	0.23	1.6	102	10	302.9	3	0	0	63	1011	10
6	6	15	166	18	0.1	0.158	0.162	0.005	1519	146	-3571.6	0.37	0.38	0.35	1.3	95	10	301	3	0	0	67	1011	3
6	6	15	166	19	-3.8	0.073	-9	-9	-999	48	9.4	0.655	0.64	1	1	81	10	300	3	0	0	77	1011	3
6	6	15	166	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	71	10	299.4	3	0	0	79	1012	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	15	166	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	77	10	298.9	3	0	0	82	1012	3
6	6	15	166	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	104	10	298.5	3	0	0	88	1012	3
6	6	15	166	23	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	103	10	298.1	3	0	0	91	1012	3
6	6	15	166	24	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	82	10	297.9	3	0	0	88	1011	3
6	6	16	167	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	86	10	297.5	3	0	0	94	1010	3
6	6	16	167	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	92	10	297.1	3	0	0	97	1010	0
6	6	16	167	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	106	10	296.9	3	0	0	94	1010	3
6	6	16	167	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	101	10	296.9	3	0	0	100	1010	3
6	6	16	167	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	107	10	297	3	0	0	100	1011	3
6	6	16	167	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	100	10	298.5	3	0	0	100	1012	3
6	6	16	167	7	30.4	0.193	-9	-9	-999	195	-21.4	0.655	0.64	0.4	1	79	10	301.4	3	0	0	94	1012	0
6	6	16	167	8	58.7	0.212	-9	-9	-999	224	-14.6	0.37	0.38	0.24	1.3	90	10	302.4	3	0	0	79	1013	0
6	6	16	167	9	56.4	0.177	-9	-9	-999	171	-8.9	0.37	0.38	0.2	1	97	10	303	3	0	0	75	1013	8
6	6	16	167	10	74.8	0.228	-9	-9	-999	251	-14.4	0.37	0.38	0.19	1.4	100	10	303	3	0	0	70	1013	8
6	6	16	167	11	97	0.257	-9	-9	-999	300	-15.8	0.37	0.38	0.19	1.6	102	10	304.5	3	0	0	65	1012	8
6	6	16	167	12	49.7	0.104	-9	-9	-999	96	-2.1	0.265	0.28	0.14	0.5	328	10	303.4	3	0	0	61	1012	9
6	6	16	167	13	62.3	0.196	-9	-9	-999	200	-10.9	0.265	0.28	0.14	1.3	328	10	303.1	3	0	0	65	1011	9
6	6	16	167	14	52.4	0.284	-9	-9	-999	348	-39.5	0.655	0.64	0.18	1.6	341	10	300.2	3	0	6.6	65	1011	10
6	6	16	167	15	34.5	0.155	-9	-9	-999	149	-9.8	0.655	0.64	0.18	0.7	356	10	300.9	3	0	0	61	1010	10
6	6	16	167	16	25.5	0.136	-9	-9	-999	115	-8.8	0.655	0.64	0.19	0.6	18	10	301.4	3	0	0	63	1009	10
6	6	16	167	17	9	0.12	-9	-9	-999	96	-17.3	0.655	0.64	0.22	0.6	43	10	301.6	3	0	0	65	1009	10
6	6	16	167	18	0.1	0.098	-9	-9	-999	71	-855.8	0.37	0.38	0.35	0.8	102	10	300.4	3	0	0	70	1009	3
6	6	16	167	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	100	10	299.4	3	0	0	77	1010	3
6	6	16	167	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	105	10	298.9	3	0	0	88	1010	3
6	6	16	167	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	298.5	3	0	0	88	1011	3
6	6	16	167	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	298.1	3	0	0	82	1011	3
6	6	16	167	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	98	10	297.9	3	0	0	88	1011	0
6	6	16	167	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	297.6	3	0	0	88	1011	7
6	6	17	168	1	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	103	10	297.5	3	0	0	94	1010	7
6	6	17	168	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	297.5	3	0	0	91	1010	7
6	6	17	168	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	297.2	3	0	0	88	1010	7
6	6	17	168	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	297.2	3	0	0	94	1010	7
6	6	17	168	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.4	3	0	0	94	1010	7
6	6	17	168	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	66	10	298.6	3	0	0	100	1011	7
6	6	17	168	7	16.4	0.133	0.494	0.005	265	111	-12.9	0.37	0.38	0.41	0.8	127	10	301.4	3	0	0	82	1012	0
6	6	17	168	8	47.8	0.24	0.897	0.005	545	270	-26.1	0.37	0.38	0.24	1.6	133	10	302.5	3	0	0	80	1013	5
6	6	17	168	9	75.2	0.229	1.201	0.005	833	251	-14.3	0.37	0.38	0.2	1.4	125	10	303.9	3	0	0	79	1013	7
6	6	17	168	10	65.1	0.204	1.171	0.005	891	212	-11.7	0.736	0.77	0.18	0.9	166	10	302	3	0	0.51	82	1013	10
6	6	17	168	11	21.9	0.194	0.819	0.005	909	196	-30.1	0.736	0.77	0.17	1	173	10	299.9	3	0	5.33	88	1013	10
6	6	17	168	12	82.3	0.194	1.308	0.005	983	197	-8	0.736	0.77	0.17	0.8	140	10	300	3	0	1.02	79	1013	10
6	6	17	168	13	48.5	0.113	1.114	0.005	1029	89	-2.7	0.37	0.38	0.18	0.5	95	10	302.2	3	0	0	94	1012	10
6	6	17	168	14	51.4	0.191	1.152	0.005	1075	192	-12.2	0.655	0.64	0.18	0.9	351	10	301.8	3	0	0	82	1012	10
6	6	17	168	15	35.1	0.141	1.025	0.005	1107	122	-7.2	0.655	0.64	0.18	0.6	9	10	302	3	0	0	85	1011	10
6	6	17	168	16	13	0.095	0.739	0.005	1119	68	-6	0.37	0.38	0.19	0.5	93	10	302	3	0	0	80	1011	10
6	6	17	168	17	3.9	0.127	0.495	0.005	1122	104	-46.9	0.37	0.38	0.23	0.9	138	10	301.6	3	0	0	80	1011	10
6	6	17	168	18	0.1	0.134	0.146	0.005	1120	113	-2178.2	0.37	0.38	0.35	1.1	117	10	300.4	3	0	0	79	1012	7
6	6	17	168	19	-2.1	0.055	-9	-9	-999	32	7.1	0.37	0.38	1	0.9	101	10	299.2	3	0	0	82	1012	7
6	6	17	168	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	80	10	298.9	3	0	0	91	1013	7
6	6	17	168	21	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	67	10	298.4	3	0	0	88	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	17	168	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	297.9	3	0	0	88	1013	7
6	6	17	168	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	297.9	3	0	0	94	1013	7
6	6	17	168	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	3	0	0	94	1012	7
6	6	18	169	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	84	10	297.4	3	0	0	94	1011	7
6	6	18	169	2	-0.7	0.03	-9	-9	-999	12	3.4	0.37	0.38	1	0.5	139	10	297.2	3	0	0	97	1011	0
6	6	18	169	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	63	10	297	3	0	0	94	1011	7
6	6	18	169	4	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	73	10	296.9	3	0	0	94	1011	7
6	6	18	169	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	68	10	296.8	3	0	0	97	1011	7
6	6	18	169	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	49	10	297.9	3	0	0	94	1012	3
6	6	18	169	7	33.1	0.154	0.808	0.005	576	140	-10	0.655	0.64	0.4	0.7	81	10	301.8	3	0	0	88	1013	0
6	6	18	169	8	48.8	0.186	0.961	0.005	658	184	-11.8	0.37	0.38	0.24	1.1	107	10	302.9	3	0	0	80	1013	3
6	6	18	169	9	93.5	0.223	1.276	0.005	805	242	-10.7	0.37	0.38	0.2	1.3	89	10	304.8	3	0	0	80	1014	0
6	6	18	169	10	104.5	0.248	1.379	0.005	908	284	-13.2	0.37	0.38	0.19	1.5	100	10	305.4	3	0	0	70	1014	6
6	6	18	169	11	116.6	0.251	1.458	0.005	962	290	-12.3	0.37	0.38	0.19	1.5	106	10	306.2	3	0	0	64	1013	7
6	6	18	169	12	83	0.33	1.328	0.005	1019	435	-39	0.37	0.38	0.18	2.3	128	10	303.8	3	0	0	66	1013	9
6	6	18	169	13	45.2	0.282	1.096	0.005	1052	346	-44.9	0.37	0.38	0.18	2	102	10	303.5	3	0	0	85	1013	10
6	6	18	169	14	31.1	0.253	0.974	0.005	1074	293	-47	0.37	0.38	0.18	1.8	101	10	302.8	3	0	0	80	1011	10
6	6	18	169	15	29.7	0.274	0.967	0.005	1095	329	-62.2	0.37	0.38	0.19	2	99	10	302.8	3	0	0	70	1010	10
6	6	18	169	16	19.3	0.244	0.84	0.005	1109	278	-68.3	0.37	0.38	0.19	1.8	99	10	302.2	3	0	0	70	1010	10
6	6	18	169	17	6.2	0.197	0.577	0.005	1112	201	-110.4	0.37	0.38	0.23	1.5	92	10	301.5	3	0	0	72	1010	10
6	6	18	169	18	0.1	0.122	0.146	0.005	1111	100	-1643.6	0.37	0.38	0.35	1	96	10	300.5	3	0	0	79	1011	7
6	6	18	169	19	-2.2	0.059	-9	-9	-999	34	8.4	0.655	0.64	1	0.8	71	10	299.9	3	0	0	82	1011	7
6	6	18	169	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	299.4	3	0	0	85	1012	7
6	6	18	169	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	299	3	0	0	82	1012	7
6	6	18	169	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	298.6	3	0	0	88	1012	7
6	6	18	169	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	298.2	3	0	0	91	1012	7
6	6	18	169	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	298.4	3	0	0	94	1012	7
6	6	19	170	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	298.5	3	0	0	94	1011	7
6	6	19	170	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	77	10	298	3	0	0	91	1010	0
6	6	19	170	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	76	10	297.6	3	0	0	94	1010	7
6	6	19	170	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	124	10	297.5	3	0	0	94	1010	3
6	6	19	170	5	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	144	10	297.4	3	0	0	97	1010	7
6	6	19	170	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	109	10	299	3	0	0	94	1011	7
6	6	19	170	7	19.9	0.158	0.612	0.005	414	145	-17.9	0.37	0.38	0.41	1	95	10	301.6	3	0	0	88	1012	0
6	6	19	170	8	49.5	0.208	0.937	0.005	600	218	-16.4	0.37	0.38	0.24	1.3	107	10	303	3	0	0	82	1012	0
6	6	19	170	9	85.1	0.243	1.222	0.005	775	275	-15.2	0.37	0.38	0.2	1.5	109	10	304.2	3	0	0	80	1013	5
6	6	19	170	10	61.8	0.235	1.133	0.005	850	262	-19	0.37	0.38	0.19	1.5	129	10	301.9	3	0	0.51	80	1013	9
6	6	19	170	11	96.4	0.235	1.365	0.005	953	262	-12.2	0.37	0.38	0.19	1.4	115	10	302.9	3	0	1.02	75	1012	8
6	6	19	170	12	98.3	0.258	1.424	0.005	1059	301	-15.7	0.37	0.38	0.18	1.6	104	10	304.4	3	0	0	75	1011	8
6	6	19	170	13	86	0.265	1.4	0.005	1151	315	-19.6	0.37	0.38	0.18	1.7	106	10	304.9	3	0	0	66	1011	9
6	6	19	170	14	89.8	0.299	1.444	0.005	1209	376	-26.8	0.37	0.38	0.18	2	100	10	305.1	3	0	0	61	1010	8
6	6	19	170	15	50.4	0.285	1.202	0.005	1240	350	-41.3	0.37	0.38	0.19	2	117	10	304.4	3	0	0	61	1010	9
6	6	19	170	16	35.4	0.31	1.074	0.005	1260	397	-75.6	0.37	0.38	0.19	2.3	107	10	302.2	3	0	0	75	1010	10
6	6	19	170	17	5.9	0.219	0.593	0.005	1262	238	-159.1	0.37	0.38	0.23	1.7	113	10	300.8	3	0	0	88	1010	10
6	6	19	170	18	0.1	0.158	0.152	0.005	1260	146	-3571.6	0.37	0.38	0.35	1.3	90	10	299.9	3	0	0	88	1011	7
6	6	19	170	19	-4.3	0.079	-9	-9	-999	53	10.3	0.37	0.38	1	1.3	88	10	298.5	3	0	0	100	1011	7
6	6	19	170	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	76	10	298.4	3	0	0	94	1011	7
6	6	19	170	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	77	10	298	3	0	0	94	1012	7
6	6	19	170	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	103	10	298	3	0	0	100	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	19	170	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	298.2	3	0	0	97	1011	7
6	6	19	170	24	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	119	10	298.5	3	0	0	100	1010	7
6	6	20	171	1	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	108	10	298.6	3	0	0	100	1010	7
6	6	20	171	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	105	10	298.5	3	0	0	97	1010	7
6	6	20	171	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	298.4	3	0	0	94	1010	7
6	6	20	171	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	298.2	3	0	0	94	1010	7
6	6	20	171	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	80	10	298.1	3	0	0	97	1011	7
6	6	20	171	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	298.5	3	0	0	94	1011	7
6	6	20	171	7	6.5	0.143	0.272	0.005	111	124	-40.3	0.37	0.38	0.41	1	92	10	299.8	3	0	0.25	94	1012	0
6	6	20	171	8	61.9	0.235	0.782	0.005	279	262	-19	0.37	0.38	0.24	1.5	127	10	301.9	3	0	0	88	1013	0
6	6	20	171	9	33.4	0.211	0.697	0.005	366	223	-25.3	0.37	0.38	0.2	1.4	108	10	300.9	3	0	0.25	94	1014	9
6	6	20	171	10	89.4	0.233	1.142	0.005	602	258	-12.7	0.37	0.38	0.19	1.4	110	10	302.1	3	0	0	75	1013	8
6	6	20	171	11	120.9	0.318	1.417	0.005	851	413	-24.1	0.37	0.38	0.19	2.1	107	10	304.5	3	0	0	75	1013	7
6	6	20	171	12	109.8	0.348	1.433	0.005	969	472	-34.7	0.37	0.38	0.18	2.4	114	10	304.8	3	0	0	75	1013	8
6	6	20	171	13	92	0.343	1.395	0.005	1066	463	-39.7	0.37	0.38	0.18	2.4	122	10	304.2	3	0	0	80	1012	9
6	6	20	171	14	70.5	0.293	1.306	0.005	1141	365	-32.1	0.37	0.38	0.18	2	118	10	304	3	0	0	70	1011	9
6	6	20	171	15	41.3	0.28	1.108	0.005	1185	342	-48.1	0.37	0.38	0.19	2	116	10	303.5	3	0	0	66	1010	10
6	6	20	171	16	15.3	0.252	0.799	0.005	1197	291	-93.9	0.37	0.38	0.19	1.9	131	10	301.8	3	0	0	70	1010	10
6	6	20	171	17	12.2	0.183	0.743	0.005	1209	182	-45.4	0.37	0.38	0.23	1.3	121	10	301.5	3	0	0	70	1010	10
6	6	20	171	18	0.1	0.146	0.15	0.005	1208	129	-2814.2	0.37	0.38	0.35	1.2	102	10	300.8	3	0	0	88	1010	7
6	6	20	171	19	-2.5	0.061	-9	-9	-999	38	7.9	0.37	0.38	1	1	95	10	300.1	3	0	0	94	1010	7
6	6	20	171	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	111	10	299.8	3	0	0	94	1012	7
6	6	20	171	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	113	10	299.4	3	0	0	94	1013	7
6	6	20	171	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	299.1	3	0	0	94	1013	7
6	6	20	171	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	100	10	299	3	0	0	94	1013	7
6	6	20	171	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	298.9	3	0	0	94	1013	7
6	6	21	172	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	68	10	298.5	3	0	0.25	94	1012	7
6	6	21	172	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	81	10	298.2	3	0	0	94	1012	7
6	6	21	172	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	124	10	298.1	3	0	0	94	1012	7
6	6	21	172	4	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	86	10	297.9	3	0	0	94	1012	7
6	6	21	172	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.8	3	0	0	94	1012	7
6	6	21	172	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	298.9	3	0	0	94	1013	7
6	6	21	172	7	20.7	0.17	-9	-9	-999	161	-21.3	0.37	0.38	0.42	1.1	99	10	301.5	3	0	0	94	1013	0
6	6	21	172	8	62.2	0.279	-9	-9	-999	338	-31.4	0.37	0.38	0.24	1.9	120	10	302.9	3	0	0	85	1014	0
6	6	21	172	9	90.7	0.299	-9	-9	-999	376	-26.7	0.37	0.38	0.2	2	120	10	304.1	3	0	0	75	1014	0
6	6	21	172	10	126.5	0.375	-9	-9	-999	529	-37.8	0.736	0.77	0.18	2	140	10	304.4	3	0	0	65	1014	8
6	6	21	172	11	93.5	0.3	-9	-9	-999	380	-26.1	0.37	0.38	0.19	2	130	10	305.1	3	0	0	57	1014	8
6	6	21	172	12	108.9	0.294	-9	-9	-999	366	-21	0.37	0.38	0.18	1.9	123	10	305.6	3	0	0	56	1013	8
6	6	21	172	13	96.4	0.29	-9	-9	-999	360	-22.9	0.37	0.38	0.18	1.9	106	10	305.8	3	0	0	56	1013	8
6	6	21	172	14	83.7	0.276	-9	-9	-999	333	-22.6	0.37	0.38	0.18	1.8	124	10	305.5	3	0	0	58	1012	9
6	6	21	172	15	74.8	0.272	-9	-9	-999	327	-24.4	0.37	0.38	0.19	1.8	115	10	305.5	3	0	0	58	1012	9
6	6	21	172	16	41.4	0.259	-9	-9	-999	303	-37.8	0.37	0.38	0.19	1.8	117	10	304.8	3	0	0	59	1012	9
6	6	21	172	17	14.2	0.218	-9	-9	-999	234	-65.9	0.37	0.38	0.23	1.6	101	10	303.4	3	0	0	65	1012	10
6	6	21	172	18	0.1	0.158	-9	-9	-999	145	-3576.3	0.37	0.38	0.35	1.3	107	10	301.2	3	0	0	70	1012	3
6	6	21	172	19	-2.3	0.055	-9	-9	-999	37	6.3	0.37	0.38	1	0.9	107	10	300	3	0	0	77	1013	3
6	6	21	172	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	102	10	299.5	3	0	0	85	1013	0
6	6	21	172	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	106	10	299.1	3	0	0	88	1014	3
6	6	21	172	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	298.8	3	0	0	88	1014	3
6	6	21	172	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	298.4	3	0	0	94	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	21	172	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	298.4	3	0	0	94	1013	3
6	6	22	173	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	298.6	3	0	0	94	1013	3
6	6	22	173	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	298.4	3	0	0	91	1012	7
6	6	22	173	3	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	53	10	297.8	3	0	0	94	1012	3
6	6	22	173	4	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	70	10	297.6	3	0	0	94	1012	7
6	6	22	173	5	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	87	10	297.5	3	0	0	94	1013	7
6	6	22	173	6	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	88	10	297.8	3	0	0	94	1013	3
6	6	22	173	7	25.4	0.242	0.495	0.005	172	274	-50.4	0.655	0.64	0.41	1.4	80	10	300.2	3	0	0	100	1013	0
6	6	22	173	8	60.9	0.246	0.813	0.005	319	280	-22	0.37	0.38	0.24	1.6	86	10	302.5	3	0	0	91	1014	0
6	6	22	173	9	129.1	0.297	1.312	0.005	634	372	-18.3	0.655	0.64	0.19	1.5	83	10	304.5	3	0	0	65	1015	0
6	6	22	173	10	61.3	0.202	1.077	0.005	737	212	-12.1	0.37	0.38	0.19	1.2	98	10	303.6	3	0	0	59	1014	9
6	6	22	173	11	84.7	0.162	1.22	0.005	775	150	-4.5	0.37	0.38	0.19	0.8	118	10	305.1	3	0	0	61	1014	8
6	6	22	173	12	61.8	0.239	1.129	0.005	841	269	-20	0.686	0.72	0.15	1.2	228	10	303.5	3	0	0	62	1013	10
6	6	22	173	13	85.7	0.18	1.318	0.005	965	177	-6.2	0.736	0.77	0.17	0.7	197	10	302.2	3	0	2.29	58	1012	10
6	6	22	173	14	48.3	0.217	1.116	0.005	1038	232	-19	0.655	0.64	0.18	1.1	345	10	302.9	3	0	0	56	1011	10
6	6	22	173	15	46.5	0.161	1.126	0.005	1107	149	-8.1	0.655	0.64	0.18	0.7	346	10	302.9	3	0	0	56	1011	10
6	6	22	173	16	28.8	0.172	0.971	0.005	1147	164	-15.8	0.736	0.77	0.18	0.8	170	10	302	3	0	0	61	1010	10
6	6	22	173	17	3.7	0.104	0.493	0.005	1150	78	-27.4	0.37	0.38	0.23	0.7	123	10	301.2	3	0	0	68	1011	10
6	6	22	173	18	0.1	0.124	0.147	0.005	1146	100	-1705	0.736	0.77	0.34	0.8	150	10	300.1	3	0	0	75	1012	3
6	6	22	173	19	-2.5	0.061	-9	-9	-999	35	7.9	0.37	0.38	1	1	111	10	299.4	3	0	0	82	1012	7
6	6	22	173	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	113	10	299.1	3	0	0	88	1013	0
6	6	22	173	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	298.9	3	0	0	88	1013	7
6	6	22	173	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298.5	3	0	0	88	1013	7
6	6	22	173	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	59	10	298.2	3	0	0	91	1013	0
6	6	22	173	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	88	1012	7
6	6	23	174	1	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	80	10	297.9	3	0	0	92	1011	0
6	6	23	174	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	82	10	297.8	3	0	0	97	1011	0
6	6	23	174	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	94	10	297.5	3	0	0	100	1010	7
6	6	23	174	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	297.5	3	0	0	94	1011	3
6	6	23	174	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	297.8	3	0	0	97	1011	7
6	6	23	174	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	298.9	3	0	0	100	1012	7
6	6	23	174	7	22.2	0.171	0.485	0.005	185	163	-20.3	0.37	0.38	0.42	1.1	119	10	301.2	3	0	0	94	1013	0
6	6	23	174	8	55	0.254	0.769	0.005	299	294	-26.9	0.37	0.38	0.24	1.7	124	10	302.5	3	0	0	82	1013	0
6	6	23	174	9	113.9	0.318	1.189	0.005	533	412	-25.5	0.736	0.77	0.19	1.6	150	10	303.1	3	0	0	75	1013	7
6	6	23	174	10	98.4	0.291	1.26	0.005	735	361	-22.6	0.37	0.38	0.19	1.9	139	10	302.8	3	0	0.25	70	1013	7
6	6	23	174	11	66.9	0.248	1.16	0.005	844	285	-20.6	0.37	0.38	0.19	1.6	122	10	301.4	3	0	1.52	72	1013	9
6	6	23	174	12	85.4	0.319	1.348	0.005	1037	415	-34.4	0.37	0.38	0.18	2.2	136	10	303.5	3	0	0	61	1012	9
6	6	23	174	13	67.6	0.292	1.313	0.006	1209	363	-33.1	0.37	0.38	0.18	2	135	10	303	3	0	0	80	1012	9
6	6	23	174	14	78.1	0.295	1.422	0.007	1329	369	-29.7	0.37	0.38	0.18	2	129	10	304	3	0	0	63	1011	9
6	6	23	174	15	76.7	0.295	1.423	0.007	1356	368	-30.1	0.37	0.38	0.19	2	113	10	304.4	3	0	0	61	1010	8
6	6	23	174	16	46	0.272	1.205	0.007	1372	327	-39.4	0.37	0.38	0.19	1.9	107	10	304	3	0	0	65	1010	9
6	6	23	174	17	15.9	0.253	0.847	0.007	1375	292	-91.1	0.37	0.38	0.23	1.9	93	10	301.9	3	0	0	63	1010	10
6	6	23	174	18	0.1	0.146	0.156	0.007	1374	133	-2816.1	0.37	0.38	0.35	1.2	98	10	299.9	3	0	0	82	1011	10
6	6	23	174	19	-2.2	0.059	-9	-9	-999	37	8.4	0.655	0.64	1	0.8	78	10	299.2	3	0	0	82	1011	7
6	6	23	174	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	97	10	298.9	3	0	0	88	1012	7
6	6	23	174	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	89	10	298.8	3	0	1.27	88	1013	7
6	6	23	174	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	100	10	298.4	3	0	0.25	88	1013	7
6	6	23	174	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	298.4	3	0	0	94	1013	7
6	6	23	174	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	298.1	3	0	0	94	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	24	175	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	297.9	3	0	0	94	1012	3
6	6	24	175	2	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	68	10	297.8	3	0	0	94	1011	7
6	6	24	175	3	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	65	10	297.5	3	0	0	94	1011	7
6	6	24	175	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	297.8	3	0	1.02	94	1011	7
6	6	24	175	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	297.6	3	0	0.25	97	1012	7
6	6	24	175	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.1	3	0	0	94	1012	7
6	6	24	175	7	13.8	0.153	0.291	0.005	64	137	-23.2	0.37	0.38	0.42	1	106	10	300.5	3	0	0	94	1013	0
6	6	24	175	8	44.3	0.26	0.698	0.005	277	306	-36	0.37	0.38	0.24	1.8	119	10	301.9	3	0	0	91	1013	0
6	6	24	175	9	89.2	0.32	1.079	0.005	510	417	-33.4	0.37	0.38	0.2	2.2	125	10	303.5	3	0	0	85	1014	0
6	6	24	175	10	92.7	0.322	1.237	0.005	739	419	-32.4	0.37	0.38	0.19	2.2	125	10	304.2	3	0	0	75	1014	7
6	6	24	175	11	106	0.336	1.368	0.005	874	448	-32.4	0.37	0.38	0.19	2.3	125	10	304.9	3	0	0	72	1013	8
6	6	24	175	12	79.6	0.318	1.278	0.005	947	412	-36.4	0.37	0.38	0.18	2.2	122	10	304.8	3	0	0	85	1012	9
6	6	24	175	13	56.8	0.288	1.163	0.005	999	355	-37.8	0.37	0.38	0.18	2	115	10	304.1	3	0	0	66	1011	10
6	6	24	175	14	46.4	0.283	1.103	0.005	1041	346	-44	0.37	0.38	0.18	2	104	10	303.4	3	0	0	70	1010	10
6	6	24	175	15	38.6	0.257	1.048	0.005	1076	301	-39.8	0.37	0.38	0.19	1.8	107	10	302.9	3	0	0	70	1010	10
6	6	24	175	16	28.1	0.24	0.951	0.005	1101	271	-44.5	0.37	0.38	0.19	1.7	112	10	302.5	3	0	0	75	1010	10
6	6	24	175	17	13.6	0.206	0.748	0.005	1112	216	-58.3	0.37	0.38	0.23	1.5	111	10	301.9	3	0	0	75	1010	10
6	6	24	175	18	0.1	0.146	0.146	0.005	1110	129	-2815.2	0.37	0.38	0.35	1.2	94	10	300.9	3	0	0	75	1010	10
6	6	24	175	19	-2.1	0.055	-9	-9	-999	34	7.1	0.37	0.38	1	0.9	94	10	299.9	3	0	0	82	1011	7
6	6	24	175	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	108	10	299.2	3	0	0	88	1012	7
6	6	24	175	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	96	10	298.9	3	0	0	88	1013	7
6	6	24	175	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	110	10	298.6	3	0	0	88	1013	7
6	6	24	175	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	100	10	298.4	3	0	0	91	1013	7
6	6	24	175	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	297.9	3	0	0	94	1013	7
6	6	25	176	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.6	3	0	0	94	1012	7
6	6	25	176	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	83	10	297.5	3	0	0	94	1012	7
6	6	25	176	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	68	10	297.1	3	0	0	94	1012	7
6	6	25	176	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	58	10	296.9	3	0	0	94	1012	7
6	6	25	176	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	89	10	296.9	3	0	0	97	1012	7
6	6	25	176	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	101	10	298.1	3	0	0	94	1012	7
6	6	25	176	7	21.2	0.181	0.463	0.005	168	177	-25.2	0.37	0.38	0.42	1.2	92	10	301.4	3	0	0	100	1013	0
6	6	25	176	8	64.5	0.247	0.8	0.005	286	283	-21.1	0.37	0.38	0.24	1.6	103	10	303	3	0	0	88	1013	0
6	6	25	176	9	90.8	0.278	1.04	0.005	448	337	-21.3	0.37	0.38	0.2	1.8	99	10	304.4	3	0	0	70	1013	0
6	6	25	176	10	119.2	0.285	1.418	0.007	866	351	-17.6	0.37	0.38	0.19	1.8	108	10	305.5	3	0	0	59	1013	2
6	6	25	176	11	127.6	0.298	1.492	0.006	942	375	-18.8	0.37	0.38	0.19	1.9	101	10	305.9	3	0	0	59	1013	6
6	6	25	176	12	115.5	0.285	1.478	0.005	1011	349	-18	0.37	0.38	0.18	1.8	106	10	306.2	3	0	0	54	1012	8
6	6	25	176	13	107.8	0.304	1.475	0.005	1076	385	-23.5	0.37	0.38	0.18	2	106	10	305.9	3	0	0	56	1011	8
6	6	25	176	14	102.7	0.303	1.479	0.005	1137	383	-24.3	0.37	0.38	0.18	2	97	10	305.9	3	0	0	54	1010	8
6	6	25	176	15	73.4	0.294	1.334	0.005	1166	366	-31.1	0.37	0.38	0.19	2	109	10	305.4	3	0	0	54	1010	9
6	6	25	176	16	48.7	0.295	1.169	0.005	1183	368	-47.4	0.37	0.38	0.19	2.1	103	10	304.5	3	0	0	58	1010	9
6	6	25	176	17	7.7	0.233	0.632	0.005	1183	259	-147.5	0.37	0.38	0.23	1.8	93	10	302.1	3	0	0	65	1010	10
6	6	25	176	18	0.1	0.17	0.149	0.005	1181	163	-4452.3	0.37	0.38	0.35	1.4	97	10	300.8	3	0	0	70	1011	3
6	6	25	176	19	-2.9	0.061	-9	-9	-999	43	7	0.37	0.38	1	1	98	10	299.9	3	0	0	82	1011	3
6	6	25	176	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	92	10	299.2	3	0	0	82	1012	0
6	6	25	176	21	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	105	10	298.6	3	0	0	82	1012	3
6	6	25	176	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	100	10	298.4	3	0	0	82	1013	3
6	6	25	176	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298	3	0	0	88	1012	7
6	6	25	176	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	65	10	297.5	3	0	0	88	1012	3
6	6	26	177	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	297.1	3	0	0	88	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	26	177	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	55	10	296.9	3	0	0	88	1011	0
6	6	26	177	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	297	3	0	0	88	1011	3
6	6	26	177	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	297	3	0	0	94	1011	3
6	6	26	177	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	297.4	3	0	0	97	1012	3
6	6	26	177	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	97	10	298.5	3	0	0	94	1012	3
6	6	26	177	7	20.1	0.191	0.479	0.005	196	192	-31.2	0.37	0.38	0.42	1.3	115	10	301	3	0	0	88	1012	0
6	6	26	177	8	49.2	0.295	0.737	0.005	293	369	-47.2	0.37	0.38	0.24	2.1	115	10	302.8	3	0	0	85	1013	0
6	6	26	177	9	76.9	0.338	0.982	0.005	444	453	-45.5	0.37	0.38	0.2	2.4	115	10	302.4	3	0	0	85	1013	6
6	6	26	177	10	116.3	0.372	1.295	0.006	676	521	-39.9	0.37	0.38	0.19	2.6	110	10	304.2	3	0	0	70	1013	4
6	6	26	177	11	76.5	0.371	1.196	0.006	807	519	-60	0.37	0.38	0.19	2.7	114	10	303.4	3	0	0	70	1012	9
6	6	26	177	12	52.7	0.329	1.071	0.006	841	435	-60.9	0.37	0.38	0.18	2.4	102	10	303.4	3	0	0	75	1012	10
6	6	26	177	13	99.6	0.378	1.358	0.005	908	534	-48.9	0.37	0.38	0.18	2.7	110	10	304.5	3	0	0	62	1011	8
6	6	26	177	14	70.7	0.358	1.232	0.005	954	492	-58.4	0.37	0.38	0.18	2.6	115	10	304.4	3	0	0	61	1011	9
6	6	26	177	15	46.4	0.315	1.082	0.005	983	408	-60.9	0.37	0.38	0.19	2.3	110	10	303.6	3	0	0	70	1010	10
6	6	26	177	16	23.4	0.27	0.866	0.005	998	323	-75.3	0.37	0.38	0.19	2	99	10	303.2	3	0	0	66	1010	10
6	6	26	177	17	4.7	0.206	0.509	0.005	998	215	-164.9	0.37	0.38	0.22	1.6	94	10	300.8	3	0	0	82	1011	10
6	6	26	177	18	0.1	0.17	0.141	0.005	996	162	-4455.2	0.37	0.38	0.35	1.4	109	10	299.8	3	0	0	85	1012	7
6	6	26	177	19	-2.5	0.061	-9	-9	-999	43	7.9	0.37	0.38	1	1	98	10	299.1	3	0	0	88	1012	7
6	6	26	177	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	104	10	299	3	0	0	97	1013	7
6	6	26	177	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	109	10	299	3	0	0	88	1013	7
6	6	26	177	22	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	121	10	299.2	3	0	0	88	1014	7
6	6	26	177	23	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	106	10	299	3	0	0	91	1014	7
6	6	26	177	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	298.9	3	0	0	82	1013	7
6	6	27	178	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	298.5	3	0	0	94	1013	7
6	6	27	178	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.5	3	0	0	94	1012	7
6	6	27	178	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	298.6	3	0	0	94	1012	7
6	6	27	178	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	298.9	3	0	1.02	94	1013	7
6	6	27	178	5	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	92	10	298.4	3	0	2.79	97	1013	7
6	6	27	178	6	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	81	10	298.1	3	0	0	94	1014	7
6	6	27	178	7	1.5	0.153	0.095	0.005	20	137	-207.9	0.37	0.38	0.42	1.2	92	10	298	3	0	0.76	94	1014	9
6	6	27	178	8	22.6	0.225	0.485	0.005	182	246	-45.9	0.37	0.38	0.24	1.6	105	10	299.4	3	0	2.03	97	1014	9
6	6	27	178	9	12.8	0.238	0.417	0.005	204	268	-95.9	0.37	0.38	0.2	1.8	121	10	298.4	3	0	0	96	1015	10
6	6	27	178	10	41	0.259	0.68	0.005	276	303	-38.2	0.37	0.38	0.19	1.8	126	10	299.6	3	0	0	95	1015	10
6	6	27	178	11	33.7	0.244	0.679	0.005	336	277	-38.9	0.37	0.38	0.19	1.7	133	10	299.8	3	0	2.03	94	1015	10
6	6	27	178	12	64.3	0.236	0.929	0.005	450	264	-18.5	0.37	0.38	0.18	1.5	96	10	301.1	3	0	0	94	1014	9
6	6	27	178	13	49.6	0.284	0.905	0.005	539	349	-41.9	0.37	0.38	0.18	2	104	10	301.9	3	0	1.78	91	1013	10
6	6	27	178	14	15.8	0.144	0.627	0.005	563	137	-16.9	0.37	0.38	0.18	0.9	89	10	298.9	3	0	0	82	1013	10
6	6	27	178	15	24.9	0.205	0.749	0.005	609	214	-31.4	0.37	0.38	0.19	1.4	124	10	299.9	3	0	1.78	88	1012	10
6	6	27	178	16	15.9	0.144	0.655	0.005	637	126	-16.8	0.37	0.38	0.19	0.9	101	10	299.9	3	0	0	88	1012	10
6	6	27	178	17	5.7	0.141	0.469	0.005	647	122	-44.5	0.37	0.38	0.22	1	102	10	300.1	3	0	0	80	1012	10
6	6	27	178	18	0.1	0.098	0.122	0.005	646	71	-858	0.37	0.38	0.34	0.8	98	10	299.6	3	0	0	85	1012	7
6	6	27	178	19	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	90	10	299.2	3	0	0	85	1013	7
6	6	27	178	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	50	10	298.6	3	0	0	94	1014	7
6	6	27	178	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	298.2	3	0	0	100	1014	7
6	6	27	178	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	298.1	3	0	0	94	1015	7
6	6	27	178	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	298.2	3	0	0	94	1015	7
6	6	27	178	24	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	95	10	298	3	0	0	100	1014	7
6	6	28	179	1	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	73	10	297.5	3	0	1.78	94	1014	7
6	6	28	179	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	81	10	297.2	3	0	0	97	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	28	179	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	53	10	297	3	0	0	94	1013	7
6	6	28	179	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297	3	0	0	94	1013	7
6	6	28	179	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	136	10	296.9	3	0	0	100	1013	7
6	6	28	179	6	-1.3	0.046	-9	-9	-999	23	6.7	0.736	0.77	1	0.6	155	10	297.6	3	0	0	100	1013	7
6	6	28	179	7	9	0.124	0.281	0.006	88	101	-19.2	0.736	0.77	0.41	0.6	157	10	299.2	3	0	0	94	1014	7
6	6	28	179	8	45	-9	-9	-9	204	-999	-99999	0.542	0.56	0.23	0	0	10	301.2	3	0	0	94	1015	8
6	6	28	179	9	13	-9	-9	-9	227	-999	-99999	0.542	0.56	0.18	0	0	10	300	3	0	10.67	91	1015	10
6	6	28	179	10	4.8	0.157	0.315	0.005	235	143	-73.5	0.736	0.77	0.18	0.9	156	10	298.1	3	0	1.02	85	1015	10
6	6	28	179	11	13.1	0.163	0.455	0.005	259	151	-29.5	0.37	0.38	0.19	1.1	139	10	298.5	3	0	0.76	91	1015	10
6	6	28	179	12	45.8	0.223	0.758	0.005	344	242	-21.9	0.736	0.77	0.17	1.1	149	10	299.5	3	0	0	94	1014	10
6	6	28	179	13	56.8	0.177	0.891	0.005	450	172	-8.8	0.37	0.38	0.18	1	110	10	300.9	3	0	0	88	1014	10
6	6	28	179	14	63.8	0.21	1.002	0.005	569	221	-13.1	0.655	0.64	0.18	1	53	10	301.4	3	0	0.25	82	1013	10
6	6	28	179	15	49.3	0.204	0.97	0.005	668	212	-15.5	0.655	0.64	0.18	1	70	10	301.4	3	0	0	80	1012	10
6	6	28	179	16	21.4	0.181	0.756	0.005	727	177	-25	0.37	0.38	0.19	1.2	91	10	301.2	3	0	0	75	1012	10
6	6	28	179	17	10.3	0.187	0.6	0.005	754	187	-57.6	0.655	0.64	0.22	1.1	82	10	300.8	3	0	0	80	1012	10
6	6	28	179	18	0.1	0.133	0.128	0.005	750	112	-2120	0.655	0.64	0.34	0.9	79	10	299.8	3	0	0	79	1013	7
6	6	28	179	19	-3.1	0.067	-9	-9	-999	41	8.7	0.37	0.38	1	1.1	97	10	299	3	0	0	82	1013	7
6	6	28	179	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	102	10	298.4	3	0	0	91	1014	7
6	6	28	179	21	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	79	10	298.1	3	0	0	88	1015	7
6	6	28	179	22	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	84	10	297.9	3	0	0	88	1015	7
6	6	28	179	23	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	96	10	298.2	3	0	0	91	1015	0
6	6	28	179	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	298.4	3	0	0	88	1014	7
6	6	29	180	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	81	10	298.2	3	0	0	94	1013	7
6	6	29	180	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	297.5	3	0	0	94	1013	7
6	6	29	180	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	61	10	297.6	3	0	0	94	1013	7
6	6	29	180	4	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	297.9	3	0	0	94	1013	7
6	6	29	180	5	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	102	10	297.9	3	0	0.25	94	1014	7
6	6	29	180	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	72	10	298.5	3	0	0	100	1014	7
6	6	29	180	7	15.5	0.165	0.62	0.005	556	154	-26.2	0.37	0.38	0.42	1.1	96	10	301	3	0	0	94	1015	0
6	6	29	180	8	57.3	0.277	1.021	0.006	674	335	-33.5	0.37	0.38	0.25	1.9	123	10	302.8	3	0	0	82	1015	0
6	6	29	180	9	71.1	0.304	1.172	0.006	819	385	-35.7	0.37	0.38	0.2	2.1	130	10	303.1	3	0	0	80	1015	7
6	6	29	180	10	149.4	0.382	1.558	0.005	917	542	-33.7	0.736	0.77	0.18	2	142	10	302.8	3	0	0	70	1015	7
6	6	29	180	11	125.9	0.341	1.515	0.005	1001	459	-28.5	0.37	0.38	0.19	2.3	130	10	304.9	3	0	0	66	1014	6
6	6	29	180	12	99.9	0.291	1.433	0.005	1066	363	-22.4	0.37	0.38	0.18	1.9	127	10	305.2	3	0	0	62	1014	8
6	6	29	180	13	84.9	0.276	1.381	0.005	1122	334	-22.3	0.37	0.38	0.18	1.8	135	10	305.4	3	0	0	62	1013	9
6	6	29	180	14	88.5	0.277	1.424	0.005	1180	335	-21.7	0.37	0.38	0.18	1.8	121	10	305	3	0	0	62	1013	8
6	6	29	180	15	40.2	0.28	1.107	0.005	1219	340	-49.2	0.37	0.38	0.19	2	107	10	303.8	3	0	0	62	1012	10
6	6	29	180	16	32	0.254	1.036	0.005	1252	294	-45.9	0.37	0.38	0.19	1.8	117	10	303	3	0	0	61	1012	10
6	6	29	180	17	6.3	0.231	0.604	0.005	1255	255	-174.8	0.37	0.38	0.22	1.8	115	10	301.8	3	0	0	72	1012	10
6	6	29	180	18	0.1	0.17	0.152	0.005	1250	162	-4462.6	0.37	0.38	0.34	1.4	107	10	300.2	3	0	0	82	1013	7
6	6	29	180	19	-3.1	0.067	-9	-9	-999	46	8.7	0.37	0.38	1	1.1	100	10	299	3	0	0	94	1014	7
6	6	29	180	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	92	10	298.8	3	0	0	97	1015	7
6	6	29	180	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	298.4	3	0	0	94	1015	7
6	6	29	180	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	68	10	298.2	3	0	0	94	1015	7
6	6	29	180	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	87	10	298.1	3	0	0	97	1015	0
6	6	29	180	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	298	3	0	0.25	100	1015	7
6	6	30	181	1	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	297.6	3	0	0	94	1014	7
6	6	30	181	2	-4.4	0.084	-9	-9	-999	56	12.3	0.736	0.77	1	1.1	154	10	297.2	3	0	1.27	97	1014	7
6	6	30	181	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	116	10	296	3	0	9.65	94	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	6	30	181	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	122	10	296.5	3	0	0.25	94	1014	7
6	6	30	181	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	42	10	296.6	3	0	0	97	1014	7
6	6	30	181	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	85	10	296.9	3	0	0.25	94	1015	7
6	6	30	181	7	-0.5	0.057	-9	-9	-999	31	31.2	0.37	0.38	0.43	0.7	98	10	298.1	3	0	0	100	1015	0
6	6	30	181	8	53.3	0.152	0.714	0.005	247	137	-6	0.37	0.38	0.25	0.8	104	10	301.6	3	0	0	88	1015	0
6	6	30	181	9	73.5	0.25	0.914	0.005	376	288	-19.3	0.37	0.38	0.2	1.6	110	10	302.9	3	0	0	85	1015	7
6	6	30	181	10	100.1	0.291	1.15	0.005	551	361	-22.3	0.37	0.38	0.19	1.9	111	10	303.9	3	0	0	80	1015	7
6	6	30	181	11	122	0.329	1.372	0.005	766	435	-26.5	0.37	0.38	0.19	2.2	103	10	304.5	3	0	0	72	1014	6
6	6	30	181	12	140	0.355	1.527	0.005	921	487	-29	0.37	0.38	0.18	2.4	110	10	305	3	0	0	70	1014	6
6	6	30	181	13	127.4	0.363	1.541	0.005	1038	504	-34	0.37	0.38	0.18	2.5	111	10	304.9	3	0	0	62	1013	7
6	6	30	181	14	103.4	0.358	1.481	0.005	1134	492	-39.9	0.37	0.38	0.18	2.5	112	10	304.8	3	0	0	70	1012	8
6	6	30	181	15	72.9	0.359	1.343	0.005	1200	494	-57.1	0.37	0.38	0.19	2.6	101	10	304.1	3	0	0	61	1012	9
6	6	30	181	16	43.3	0.325	1.141	0.005	1237	426	-71.3	0.37	0.38	0.19	2.4	110	10	303.4	3	0	0	70	1012	9
6	6	30	181	17	13.7	0.273	0.781	0.005	1247	329	-133.2	0.37	0.38	0.22	2.1	103	10	302.4	3	0	0	68	1012	10
6	6	30	181	18	0.1	0.219	0.151	0.005	1244	236	-8888	0.37	0.38	0.34	1.8	107	10	300.9	3	0	0	75	1012	7
6	6	30	181	19	-5	0.085	-9	-9	-999	70	11.1	0.37	0.38	1	1.4	99	10	300.4	3	0	0	79	1012	7
6	6	30	181	20	-5.7	0.085	-9	-9	-999	57	9.6	0.37	0.38	1	1.4	100	10	299.9	3	0	0	82	1013	0
6	6	30	181	21	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	100	10	299.6	3	0	0	82	1014	3
6	6	30	181	22	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	90	10	299.4	3	0	0	82	1014	3
6	6	30	181	23	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	96	10	299.4	3	0	0	88	1014	0
6	6	30	181	24	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	114	10	299.2	3	0	0	82	1014	3
6	7	1	182	1	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	115	10	298.9	3	0	1.27	88	1013	3
6	7	1	182	2	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	118	10	298.4	3	0	0.25	91	1013	7
6	7	1	182	3	-5.6	0.085	-9	-9	-999	57	9.8	0.37	0.38	1	1.4	106	10	297.9	3	0	10.41	94	1013	3
6	7	1	182	4	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	84	10	297.4	3	0	0.51	94	1013	7
6	7	1	182	5	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	102	10	297.8	3	0	1.27	94	1014	7
6	7	1	182	6	-5	0.085	-9	-9	-999	57	11.1	0.37	0.38	1	1.4	113	10	297.9	3	0	0.51	100	1014	7
6	7	1	182	7	-0.5	0.167	-9	-9	-999	156	766.5	0.37	0.38	0.43	1.4	113	10	300.6	3	0	0	94	1015	0
6	7	1	182	8	37	0.256	0.571	0.005	182	299	-41.3	0.37	0.38	0.25	1.8	122	10	301.5	3	0	0	94	1015	7
6	7	1	182	9	34.3	0.222	0.616	0.005	246	241	-29	0.37	0.38	0.2	1.5	118	10	300	3	0	4.06	88	1016	9
6	7	1	182	10	73	0.305	0.919	0.005	385	387	-35.1	0.37	0.38	0.19	2.1	132	10	301.8	3	0	0	91	1015	8
6	7	1	182	11	43	0.281	0.821	0.005	465	343	-46.9	0.37	0.38	0.19	2	133	10	301	3	0	0.25	85	1015	10
6	7	1	182	12	61.8	0.246	0.998	0.005	582	281	-21.8	0.37	0.38	0.18	1.6	133	10	301.1	3	0	0.51	80	1015	9
6	7	1	182	13	73.6	0.294	1.138	0.005	724	366	-31.1	0.37	0.38	0.18	2	118	10	302.2	3	0	0	75	1014	9
6	7	1	182	14	86.5	0.309	1.259	0.005	835	395	-30.7	0.37	0.38	0.18	2.1	120	10	303.2	3	0	0	88	1013	9
6	7	1	182	15	68.7	0.303	1.177	0.005	857	384	-36.6	0.37	0.38	0.19	2.1	108	10	303.1	3	0	0	75	1013	9
6	7	1	182	16	41.3	0.27	1.008	0.005	897	322	-42.9	0.37	0.38	0.19	1.9	99	10	301.4	3	0	0	88	1013	9
6	7	1	182	17	15.7	0.23	0.736	0.005	916	255	-70.2	0.37	0.38	0.22	1.7	92	10	301.2	3	0	0	88	1013	10
6	7	1	182	18	0.1	0.158	0.136	0.005	911	146	-3578.7	0.37	0.38	0.34	1.3	105	10	298.9	3	0	0	94	1013	7
6	7	1	182	19	-4.6	0.081	-9	-9	-999	54	10.3	0.655	0.64	1	1.1	70	10	298.4	3	0	0	88	1014	3
6	7	1	182	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	298.2	3	0	0	94	1014	7
6	7	1	182	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	298	3	0	0	94	1014	7
6	7	1	182	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	297.6	3	0	0	88	1015	3
6	7	1	182	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	72	10	297.4	3	0	0	94	1015	0
6	7	1	182	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	297.5	3	0	0	94	1014	7
6	7	2	183	1	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	82	10	297.8	3	0	0	100	1014	3
6	7	2	183	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	297.9	3	0	0	97	1014	3
6	7	2	183	3	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	83	10	297.6	3	0	0	94	1014	3
6	7	2	183	4	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	82	10	297.6	3	0	0	100	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	2	183	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	69	10	297.2	3	0	0	97	1014	7
6	7	2	183	6	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	86	10	297.8	3	0	0	94	1014	3
6	7	2	183	7	-1	0.201	-9	-9	-999	207	753.7	0.655	0.64	0.42	1.4	76	10	299.9	3	0	0	94	1015	0
6	7	2	183	8	58.1	0.277	0.734	0.005	246	335	-33.1	0.37	0.38	0.25	1.9	94	10	302	3	0	0	91	1015	0
6	7	2	183	9	74.7	0.283	0.967	0.005	438	346	-27.5	0.37	0.38	0.2	1.9	93	10	303	3	0	0	85	1015	6
6	7	2	183	10	103.7	0.292	1.263	0.005	705	363	-21.8	0.37	0.38	0.19	1.9	103	10	303.6	3	0	0	80	1015	6
6	7	2	183	11	95.8	0.322	1.308	0.006	847	421	-31.6	0.37	0.38	0.19	2.2	107	10	301.6	3	0	4.06	70	1015	8
6	7	2	183	12	98.5	0.323	1.352	0.006	909	423	-31	0.37	0.38	0.18	2.2	101	10	301.9	3	0	1.02	85	1015	8
6	7	2	183	13	43.4	0.271	1.04	0.006	937	325	-41.3	0.37	0.38	0.18	1.9	121	10	302	3	0	0	91	1014	10
6	7	2	183	14	37.1	0.224	0.995	0.006	961	244	-27.3	0.37	0.38	0.18	1.5	130	10	302.1	3	0	0	72	1014	10
6	7	2	183	15	38.3	0.224	1.015	0.006	986	245	-26.6	0.37	0.38	0.19	1.5	110	10	302.4	3	0	0	85	1013	10
6	7	2	183	16	26.6	0.228	0.903	0.006	1002	251	-40.5	0.37	0.38	0.19	1.6	117	10	301.8	3	0	0	80	1013	10
6	7	2	183	17	7.2	0.187	0.584	0.006	1005	187	-82.9	0.37	0.38	0.22	1.4	100	10	300.8	3	0	0	85	1013	10
6	7	2	183	18	0.1	0.118	0.141	0.006	1002	95	-1501.8	0.655	0.64	0.33	0.8	82	10	298.8	3	0	0	94	1014	7
6	7	2	183	19	-1.2	0.044	-9	-9	-999	24	6.3	0.655	0.64	1	0.6	75	10	298.6	3	0	0	94	1014	7
6	7	2	183	20	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	69	10	298.4	3	0	0	97	1015	7
6	7	2	183	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	81	10	298.2	3	0	0	94	1015	7
6	7	2	183	22	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	70	10	298	3	0	0	94	1016	7
6	7	2	183	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	56	10	297.6	3	0	0	94	1015	7
6	7	2	183	24	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	72	10	297.4	3	0	0	97	1015	3
6	7	3	184	1	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	103	10	297.1	3	0	1.27	100	1014	7
6	7	3	184	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	57	10	297	3	0	1.02	97	1014	7
6	7	3	184	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	297	3	0	0.76	100	1014	7
6	7	3	184	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	44	10	297.2	3	0	0.25	94	1014	7
6	7	3	184	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	99	10	297.2	3	0	2.29	94	1014	7
6	7	3	184	6	-1	0.042	-9	-9	-999	20	6.8	0.37	0.38	1	0.7	110	10	297.2	3	0	2.29	94	1015	10
6	7	3	184	7	3.2	-9	-9	-9	36	-999	-99999	0.542	0.56	0.41	0	0	10	297.6	3	0	0.25	94	1015	9
6	7	3	184	8	28.5	0.185	0.506	0.006	164	183	-20.1	0.736	0.77	0.24	0.9	150	10	298.6	3	0	0	97	1015	10
6	7	3	184	9	94.8	0.228	0.932	0.006	309	250	-11.3	0.736	0.77	0.19	1	154	10	300.9	3	0	0	85	1015	8
6	7	3	184	10	117.1	0.304	1.165	0.005	489	386	-21.8	0.736	0.77	0.18	1.5	170	10	302.1	3	0	0	91	1015	8
6	7	3	184	11	106	0.274	1.241	0.005	652	330	-17.5	0.736	0.77	0.17	1.3	181	10	302.9	3	0	0	75	1015	9
6	7	3	184	12	80.1	0.252	1.197	0.006	775	291	-18	0.736	0.77	0.17	1.2	192	10	302.9	3	0	0	70	1015	10
6	7	3	184	13	94.4	0.298	1.334	0.006	910	374	-25.4	0.736	0.77	0.17	1.5	200	10	303.4	3	0	0	70	1014	10
6	7	3	184	14	82.5	0.253	1.322	0.007	1012	293	-17.6	0.736	0.77	0.17	1.2	154	10	303.6	3	0	0	64	1013	10
6	7	3	184	15	45.1	0.239	1.088	0.007	1034	268	-27.2	0.37	0.38	0.19	1.6	134	10	303.4	3	0	0	82	1013	10
6	7	3	184	16	20.7	0.191	0.842	0.007	1043	193	-30.6	0.37	0.38	0.19	1.3	97	10	302.5	3	0	0	91	1013	10
6	7	3	184	17	3.4	0.229	0.464	0.007	1042	252	-313.8	0.655	0.64	0.22	1.5	85	10	300.8	3	0	1.27	88	1014	10
6	7	3	184	18	0.1	0.207	0.142	0.007	1040	216	-7970.6	0.37	0.38	0.34	1.7	100	10	298.6	3	0	0.25	88	1014	3
6	7	3	184	19	-4.3	0.079	-9	-9	-999	63	10.3	0.37	0.38	1	1.3	126	10	297.8	3	0	3.3	94	1016	7
6	7	3	184	20	-2.1	0.061	-9	-9	-999	34	9.7	0.37	0.38	1	1	127	10	296.9	3	0	5.33	97	1016	10
6	7	3	184	21	-1.8	0.054	-9	-9	-999	29	7.8	0.736	0.77	1	0.7	142	10	297.1	3	0	1.02	94	1016	7
6	7	3	184	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	297.2	3	0	0.25	94	1016	7
6	7	3	184	23	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	1	0.7	79	10	297.1	3	0	0	97	1016	10
6	7	3	184	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	106	10	297.2	3	0	0	94	1015	7
6	7	4	185	1	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	81	10	297.1	3	0	0	94	1014	7
6	7	4	185	2	-0.7	0.037	-9	-9	-999	16	6.4	0.655	0.64	1	0.5	79	10	297.1	3	0	0	100	1014	10
6	7	4	185	3	-0.7	0.037	-9	-9	-999	16	6.4	0.655	0.64	1	0.5	69	10	297	3	0	0	94	1014	10
6	7	4	185	4	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	67	10	297.1	3	0	0	94	1014	7
6	7	4	185	5	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	64	10	297.2	3	0	0	97	1014	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	4	185	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	60	10	297.6	3	0	0	100	1015	7
6	7	4	185	7	-0.8	0.07	-9	-9	-999	42	38.3	0.37	0.38	0.43	0.8	86	10	299.2	3	0	0	94	1016	0
6	7	4	185	8	45.8	0.195	0.646	0.005	213	198	-14.7	0.37	0.38	0.25	1.2	110	10	301.9	3	0	0	88	1016	4
6	7	4	185	9	83.3	0.297	1.082	0.005	550	372	-28.4	0.37	0.38	0.2	2	113	10	303.4	3	0	0	80	1016	5
6	7	4	185	10	72.6	0.282	1.133	0.005	727	345	-28.1	0.37	0.38	0.19	1.9	114	10	303.9	3	0	0	75	1016	8
6	7	4	185	11	66.6	0.269	1.137	0.005	799	322	-26.6	0.37	0.38	0.19	1.8	108	10	303.8	3	0	0	70	1015	9
6	7	4	185	12	80.5	0.296	1.253	0.005	885	370	-29.1	0.37	0.38	0.18	2	105	10	303.8	3	0	0	70	1015	9
6	7	4	185	13	97	0.345	1.385	0.005	990	466	-38.2	0.37	0.38	0.18	2.4	100	10	304.4	3	0	0	70	1014	8
6	7	4	185	14	85.6	0.341	1.368	0.006	1082	459	-42	0.37	0.38	0.18	2.4	105	10	304	3	0	0	68	1014	9
6	7	4	185	15	51.2	0.318	1.172	0.007	1136	412	-56.5	0.37	0.38	0.19	2.3	99	10	303.4	3	0	0	75	1013	9
6	7	4	185	16	25.6	0.293	0.937	0.007	1161	365	-88.8	0.37	0.38	0.19	2.2	101	10	302.4	3	0	0	70	1013	10
6	7	4	185	17	13.6	0.273	0.761	0.007	1174	328	-134.9	0.37	0.38	0.22	2.1	94	10	301.9	3	0	0	72	1013	10
6	7	4	185	18	0.1	0.207	0.148	0.007	1171	217	-7965.3	0.37	0.38	0.34	1.7	101	10	300.5	3	0	0	75	1014	7
6	7	4	185	19	-3.1	0.067	-9	-9	-999	59	8.7	0.37	0.38	1	1.1	99	10	299.9	3	0	0	79	1014	7
6	7	4	185	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	94	10	299.5	3	0	0	79	1015	0
6	7	4	185	21	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	94	10	299.6	3	0	0	88	1015	7
6	7	4	185	22	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	107	10	299.4	3	0	0	82	1016	7
6	7	4	185	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	101	10	299.1	3	0	0	82	1015	7
6	7	4	185	24	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	106	10	299	3	0	0	82	1015	7
6	7	5	186	1	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	115	10	298.6	3	0	0	88	1014	7
6	7	5	186	2	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	111	10	298.6	3	0	0	88	1014	0
6	7	5	186	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	298.2	3	0	0	88	1014	7
6	7	5	186	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	298	3	0	0	88	1014	7
6	7	5	186	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	101	10	298.2	3	0	0	88	1014	7
6	7	5	186	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	298.5	3	0	0	88	1015	7
6	7	5	186	7	-1.3	0.147	-9	-9	-999	130	218.7	0.37	0.38	0.43	1.3	97	10	300.5	3	0	0	82	1015	0
6	7	5	186	8	53.5	0.297	1.06	0.005	806	372	-44.3	0.37	0.38	0.25	2.1	104	10	302.5	3	0	0	77	1016	0
6	7	5	186	9	85.9	0.319	1.278	0.005	882	415	-34.4	0.37	0.38	0.2	2.2	108	10	304	3	0	0	61	1016	3
6	7	5	186	10	114.1	0.371	1.448	0.005	965	520	-40.6	0.37	0.38	0.19	2.6	108	10	304.8	3	0	0	59	1016	5
6	7	5	186	11	121	0.394	1.521	0.005	1054	570	-45.9	0.37	0.38	0.19	2.8	105	10	304.9	3	0	0	61	1016	7
6	7	5	186	12	117.5	0.372	1.547	0.005	1141	522	-39.7	0.37	0.38	0.18	2.6	103	10	305.2	3	0	0	61	1015	7
6	7	5	186	13	111.2	0.37	1.554	0.005	1223	518	-41.3	0.37	0.38	0.18	2.6	102	10	305.1	3	0	0	61	1014	8
6	7	5	186	14	87.1	0.342	1.458	0.005	1287	460	-41.4	0.37	0.38	0.18	2.4	95	10	304.9	3	0	0	61	1014	8
6	7	5	186	15	74.4	0.338	1.483	0.011	1589	451	-46.7	0.37	0.38	0.19	2.4	92	10	304.6	3	0	0	61	1014	9
6	7	5	186	16	42.2	0.313	1.243	0.012	1644	404	-65.8	0.37	0.38	0.19	2.3	92	10	303.9	3	0	0	61	1014	9
6	7	5	186	17	10	0.247	0.771	0.012	1651	283	-135.4	0.37	0.38	0.22	1.9	90	10	301.9	3	0	0	70	1014	10
6	7	5	186	18	0.1	0.191	0.166	0.012	1642	193	-6318.3	0.655	0.64	0.33	1.3	85	10	299.6	3	0	0	75	1014	3
6	7	5	186	19	-4.1	0.081	-9	-9	-999	60	11.6	0.655	0.64	1	1.1	79	10	299.2	3	0	0	79	1015	7
6	7	5	186	20	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	80	10	299	3	0	0	79	1015	0
6	7	5	186	21	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	76	10	298.8	3	0	0	79	1015	7
6	7	5	186	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	298.6	3	0	0	82	1016	3
6	7	5	186	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	62	10	298.4	3	0	0	82	1015	0
6	7	5	186	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	298.1	3	0	0	82	1014	3
6	7	6	187	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	72	10	298	3	0	0	82	1014	3
6	7	6	187	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	93	10	298.2	3	0	0	79	1014	0
6	7	6	187	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	298.4	3	0	0	77	1014	3
6	7	6	187	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	62	10	298.4	3	0	0	82	1014	3
6	7	6	187	5	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	49	10	298.8	3	0	0	79	1014	7
6	7	6	187	6	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	64	10	299.6	3	0	0	79	1015	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	6	187	7	-0.9	0.186	-9	-9	-999	184	662.6	0.655	0.64	0.43	1.3	78	10	301.6	3	0	0	79	1016	0
6	7	6	187	8	30	0.263	0.57	0.005	224	310	-54.9	0.37	0.38	0.25	1.9	90	10	301.4	3	0	0	75	1016	8
6	7	6	187	9	55	0.298	0.822	0.005	366	373	-43.5	0.37	0.38	0.2	2.1	86	10	302.8	3	0	0	65	1017	8
6	7	6	187	10	66.2	0.324	0.994	0.005	538	423	-46.5	0.37	0.38	0.19	2.3	92	10	303.4	3	0	0	70	1017	9
6	7	6	187	11	73	0.315	1.137	0.005	729	407	-38.9	0.37	0.38	0.19	2.2	97	10	304	3	0	0	64	1016	9
6	7	6	187	12	57.7	0.331	1.107	0.005	853	438	-57	0.37	0.38	0.18	2.4	110	10	303.2	3	0	0	66	1016	10
6	7	6	187	13	57.8	0.288	1.139	0.005	926	356	-37.4	0.37	0.38	0.18	2	111	10	303.5	3	0	0	61	1015	10
6	7	6	187	14	46.4	0.294	1.081	0.005	985	366	-49.4	0.37	0.38	0.18	2.1	94	10	303.2	3	0	0	63	1014	10
6	7	6	187	15	32.2	0.275	0.97	0.005	1024	332	-58.4	0.37	0.38	0.19	2	95	10	302.6	3	0	0	61	1014	10
6	7	6	187	16	16.7	0.242	0.785	0.005	1044	274	-76.7	0.37	0.38	0.19	1.8	88	10	302	3	0	0	65	1013	10
6	7	6	187	17	5	0.184	0.525	0.005	1049	182	-112.3	0.37	0.38	0.22	1.4	91	10	301.4	3	0	0	72	1014	10
6	7	6	187	18	0.1	0.146	0.143	0.005	1047	129	-2827.3	0.37	0.38	0.34	1.2	93	10	300.6	3	0	0	75	1015	7
6	7	6	187	19	-1.6	0.049	-9	-9	-999	31	6.3	0.37	0.38	1	0.8	98	10	299.9	3	0	0	79	1016	7
6	7	6	187	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	71	10	299.2	3	0	0	85	1016	0
6	7	6	187	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	80	10	298.9	3	0	0	88	1016	7
6	7	6	187	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	298.5	3	0	0	82	1016	7
6	7	6	187	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	69	10	298	3	0	0	88	1016	7
6	7	6	187	24	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	83	10	298.4	3	0	0	88	1015	7
6	7	7	188	1	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	298	3	0	0	94	1015	7
6	7	7	188	2	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	79	10	297.6	3	0	0	97	1015	7
6	7	7	188	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	55	10	297.1	3	0	0	94	1015	7
6	7	7	188	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	80	10	296.9	3	0	0	94	1015	7
6	7	7	188	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	87	10	296.8	3	0	0	94	1015	0
6	7	7	188	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	94	10	297.9	3	0	0	94	1015	7
6	7	7	188	7	-1.4	0.133	-9	-9	-999	111	155	0.37	0.38	0.44	1.2	113	10	300.9	3	0	0	94	1015	0
6	7	7	188	8	46.5	0.239	0.793	0.005	388	269	-26.7	0.37	0.38	0.25	1.6	100	10	302.4	3	0	0	85	1016	0
6	7	7	188	9	84.5	0.341	1.224	0.005	786	458	-42.5	0.37	0.38	0.2	2.4	109	10	303.4	3	0	0	80	1016	5
6	7	7	188	10	105.2	0.347	1.358	0.005	864	470	-36	0.37	0.38	0.19	2.4	110	10	304.2	3	0	0	70	1016	6
6	7	7	188	11	129.9	0.364	1.488	0.005	919	505	-33.6	0.37	0.38	0.19	2.5	107	10	305.2	3	0	0	59	1015	6
6	7	7	188	12	111.3	0.316	1.458	0.005	1009	409	-25.6	0.37	0.38	0.18	2.1	101	10	305.4	3	0	0	59	1015	8
6	7	7	188	13	115.1	0.328	1.584	0.006	1250	431	-27.6	0.37	0.38	0.18	2.2	102	10	305.4	3	0	0	56	1014	8
6	7	7	188	14	77	0.306	1.441	0.008	1406	389	-33.5	0.37	0.38	0.18	2.1	106	10	304.5	3	0	0	57	1014	9
6	7	7	188	15	66.6	0.302	1.404	0.009	1502	382	-37.5	0.37	0.38	0.19	2.1	106	10	304	3	0	0	58	1013	9
6	7	7	188	16	38.3	0.311	1.171	0.009	1514	399	-71.1	0.37	0.38	0.19	2.3	97	10	303.1	3	0	0	63	1013	10
6	7	7	188	17	8.8	0.212	0.716	0.009	1516	228	-97.8	0.37	0.38	0.22	1.6	87	10	301.8	3	0	0	65	1013	10
6	7	7	188	18	0.1	0.146	0.162	0.009	1515	130	-2821.7	0.37	0.38	0.34	1.2	86	10	300.4	3	0	0	70	1013	7
6	7	7	188	19	-2.1	0.055	-9	-9	-999	34	7.1	0.37	0.38	1	0.9	102	10	299.4	3	0	0	79	1014	7
6	7	7	188	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	111	10	298.8	3	0	0	82	1014	0
6	7	7	188	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	116	10	298.5	3	0	0	82	1015	3
6	7	7	188	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	298.2	3	0	0	82	1015	3
6	7	7	188	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	91	10	297.9	3	0	0	88	1015	0
6	7	7	188	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	64	10	297.4	3	0	0	88	1014	3
6	7	8	189	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.5	3	0	0	94	1014	3
6	7	8	189	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	71	10	297.6	3	0	0	94	1013	0
6	7	8	189	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	55	10	297.1	3	0	0	94	1013	3
6	7	8	189	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	297.1	3	0	0	94	1013	3
6	7	8	189	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	66	10	297	3	0	0	97	1013	0
6	7	8	189	6	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	62	10	298.4	3	0	0	100	1014	3
6	7	8	189	7	-1.5	0.148	-9	-9	-999	131	198.9	0.655	0.64	0.43	1.1	82	10	300.9	3	0	0	94	1014	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	8	189	8	58.3	0.255	0.876	0.005	417	297	-25.8	0.37	0.38	0.25	1.7	104	10	302.9	3	0	0	80	1015	0
6	7	8	189	9	84.8	0.297	1.237	0.005	809	373	-28	0.37	0.38	0.2	2	110	10	304	3	0	0	66	1015	5
6	7	8	189	10	115.5	0.295	1.434	0.005	924	369	-20.2	0.37	0.38	0.19	1.9	97	10	305.4	3	0	0	66	1015	4
6	7	8	189	11	125.1	0.33	1.52	0.005	1017	436	-26	0.37	0.38	0.19	2.2	104	10	305.8	3	0	0	68	1014	6
6	7	8	189	12	116.6	0.307	1.519	0.005	1087	391	-22.3	0.37	0.38	0.18	2	100	10	306.1	3	0	0	58	1013	7
6	7	8	189	13	101.5	0.292	1.47	0.005	1131	363	-22.1	0.37	0.38	0.18	1.9	112	10	305.9	3	0	0	62	1013	8
6	7	8	189	14	90.1	0.278	1.484	0.005	1309	336	-21.4	0.37	0.38	0.18	1.8	100	10	305.9	3	0	0	60	1012	8
6	7	8	189	15	73.5	0.283	1.467	0.008	1551	346	-27.7	0.37	0.38	0.19	1.9	92	10	305.5	3	0	0	62	1011	9
6	7	8	189	16	45.1	0.272	1.25	0.008	1563	326	-40	0.37	0.38	0.19	1.9	96	10	304.8	3	0	0	58	1011	9
6	7	8	189	17	12.9	0.25	0.825	0.008	1566	287	-108.4	0.37	0.38	0.22	1.9	103	10	303.2	3	0	0	63	1011	10
6	7	8	189	18	0.1	0.194	0.163	0.008	1564	198	-6631.1	0.37	0.38	0.34	1.6	103	10	301.4	3	0	0	65	1011	3
6	7	8	189	19	-2.9	0.061	-9	-9	-999	52	7	0.37	0.38	1	1	93	10	300.1	3	0	0	79	1012	3
6	7	8	189	20	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	77	10	299.5	3	0	0	82	1012	3
6	7	8	189	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	299	3	0	0	82	1013	3
6	7	8	189	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	298.8	3	0	0	82	1013	3
6	7	8	189	23	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	87	10	298.6	3	0	0	88	1013	3
6	7	8	189	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	298.4	3	0	0	82	1012	3
6	7	9	190	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	298.4	3	0	0	88	1011	3
6	7	9	190	2	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	81	10	298.2	3	0	0	94	1011	7
6	7	9	190	3	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	76	10	298	3	0	0	94	1010	0
6	7	9	190	4	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	297.9	3	0	0	94	1011	3
6	7	9	190	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	64	10	297.9	3	0	0	97	1011	0
6	7	9	190	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	42	10	298.1	3	0	0	88	1012	3
6	7	9	190	7	6.1	0.154	-9	-9	-999	139	-54.2	0.655	0.64	0.43	0.9	62	10	298.8	3	0	0	94	1012	7
6	7	9	190	8	59.9	0.245	-9	-9	-999	280	-22.3	0.37	0.38	0.25	1.6	93	10	301.4	3	0	0	94	1012	0
6	7	9	190	9	94.1	0.3	-9	-9	-999	378	-25.9	0.37	0.38	0.2	2	103	10	303.8	3	0	0	94	1012	0
6	7	9	190	10	89	0.288	-9	-9	-999	355	-24.2	0.37	0.38	0.19	1.9	112	10	304.4	3	0	0	85	1013	7
6	7	9	190	11	79.7	0.285	-9	-9	-999	350	-26.2	0.37	0.38	0.19	1.9	116	10	305.1	3	0	0	75	1012	9
6	7	9	190	12	111.9	0.295	-9	-9	-999	368	-20.6	0.37	0.38	0.18	1.9	104	10	303.9	3	0	0.51	75	1012	8
6	7	9	190	13	120.1	0.308	-9	-9	-999	392	-21.8	0.37	0.38	0.18	2	110	10	305.5	3	0	0	80	1010	7
6	7	9	190	14	101.4	0.313	-9	-9	-999	403	-27.3	0.37	0.38	0.18	2.1	116	10	305.8	3	0	0	75	1009	8
6	7	9	190	15	77	0.328	-9	-9	-999	432	-41.2	0.37	0.38	0.19	2.3	99	10	304.9	3	0	0	66	1009	9
6	7	9	190	16	47.3	0.283	-9	-9	-999	348	-43.3	0.37	0.38	0.19	2	96	10	304	3	0	0	66	1009	9
6	7	9	190	17	24.9	0.282	-9	-9	-999	344	-80.7	0.37	0.38	0.22	2.1	98	10	303.4	3	0	0	77	1010	9
6	7	9	190	18	0.1	0.182	-9	-9	-999	183	-5466.3	0.37	0.38	0.34	1.5	105	10	300.8	3	0	0	91	1010	10
6	7	9	190	19	-3.7	0.073	-9	-9	-999	53	9.5	0.37	0.38	1	1.2	95	10	299.9	3	0	0.25	94	1011	7
6	7	9	190	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	82	10	299.4	3	0	0	91	1012	7
6	7	9	190	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	298.9	3	0	0.51	88	1012	7
6	7	9	190	22	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	83	10	298.9	3	0	0	88	1012	7
6	7	9	190	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	106	10	298.8	3	0	0	94	1012	7
6	7	9	190	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	298.5	3	0	0	94	1012	7
6	7	10	191	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	78	10	298.4	3	0	0	94	1010	7
6	7	10	191	2	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	74	10	297.9	3	0	0	94	1010	7
6	7	10	191	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	108	10	297.8	3	0	3.3	94	1010	7
6	7	10	191	4	-6.6	0.091	-9	-9	-999	63	10.3	0.37	0.38	1	1.5	96	10	297.8	3	0	0.25	94	1010	0
6	7	10	191	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	297.4	3	0	0	94	1010	7
6	7	10	191	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	66	10	297.8	3	0	0	94	1011	7
6	7	10	191	7	4.9	0.165	0.24	0.005	101	154	-81.5	0.655	0.64	0.43	1	79	10	298.9	3	0	0	94	1012	7
6	7	10	191	8	13.1	0.195	0.405	0.005	183	198	-51.3	0.37	0.38	0.25	1.4	100	10	298.6	3	0	1.27	94	1012	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	10	191	9	47.7	0.218	0.739	0.005	305	235	-19.7	0.37	0.38	0.2	1.4	104	10	299.8	3	0	0.25	94	1012	9
6	7	10	191	10	89.4	0.321	1.099	0.005	536	418	-33.2	0.37	0.38	0.19	2.2	120	10	302.4	3	0	0	91	1012	7
6	7	10	191	11	45.7	0.304	0.938	0.005	652	386	-55.6	0.37	0.38	0.19	2.2	101	10	301.6	3	0	0.25	94	1012	10
6	7	10	191	12	37.6	0.268	0.919	0.005	745	319	-46	0.37	0.38	0.18	1.9	98	10	300.1	3	0	0	88	1012	10
6	7	10	191	13	69.5	0.303	1.173	0.005	839	384	-36.3	0.37	0.38	0.18	2.1	108	10	301.5	3	0	0	88	1012	9
6	7	10	191	14	46.9	0.294	1.047	0.005	882	367	-48.9	0.37	0.38	0.18	2.1	102	10	301.4	3	0	0	94	1011	10
6	7	10	191	15	52.1	0.264	1.104	0.005	931	312	-31.7	0.37	0.38	0.19	1.8	97	10	302.2	3	0	0	94	1010	9
6	7	10	191	16	30.2	0.253	0.93	0.005	958	292	-48	0.37	0.38	0.19	1.8	94	10	301.5	3	0	0	94	1010	10
6	7	10	191	17	8.2	0.278	0.602	0.005	963	336	-235.9	0.655	0.64	0.21	1.8	83	10	299.9	3	0	0	94	1010	10
6	7	10	191	18	0.1	0.162	0.139	0.005	962	156	-3832	0.655	0.64	0.33	1.1	71	10	299	3	0	0	100	1011	10
6	7	10	191	19	-4.9	0.088	-9	-9	-999	62	12.6	0.655	0.64	1	1.2	67	10	298.8	3	0	0	100	1012	7
6	7	10	191	20	-3.3	0.081	-9	-9	-999	53	14.2	0.655	0.64	1	1.1	50	10	298	3	0	0	97	1013	10
6	7	10	191	21	-6.7	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	76	10	297.9	3	0	0.25	94	1013	7
6	7	10	191	22	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	115	10	297.5	3	0	1.27	95	1013	7
6	7	10	191	23	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	119	10	297.8	3	0	0	97	1013	7
6	7	10	191	24	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	113	10	297.8	3	0	3.05	94	1013	7
6	7	11	192	1	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	93	10	297.4	3	0	0	100	1012	7
6	7	11	192	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	297.8	3	0	0	97	1011	7
6	7	11	192	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	297.8	3	0	0.25	94	1011	7
6	7	11	192	4	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	67	10	297.4	3	0	0	100	1011	7
6	7	11	192	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	297.2	3	0	0	97	1012	7
6	7	11	192	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	91	10	298.2	3	0	0.76	94	1012	7
6	7	11	192	7	5.6	0.166	0.245	0.005	95	156	-74	0.655	0.64	0.43	1	76	10	299.1	3	0	0.25	94	1013	6
6	7	11	192	8	51	0.205	0.709	0.005	252	213	-15.2	0.655	0.64	0.24	1	79	10	300.4	3	0	0	91	1013	8
6	7	11	192	9	51.8	0.271	0.806	0.005	365	324	-34.6	0.655	0.64	0.19	1.5	73	10	301.4	3	0	0.25	85	1013	9
6	7	11	192	10	22.6	0.226	0.638	0.005	413	247	-45.8	0.37	0.38	0.19	1.6	103	10	300.8	3	0	1.02	78	1013	10
6	7	11	192	11	0.1	0.276	0.105	0.005	410	334	-8888	0.736	0.77	0.17	1.8	175	10	297.9	3	0	25.15	72	1014	10
6	7	11	192	12	0.1	0.184	0.104	0.005	410	185	-5671.6	0.736	0.77	0.17	1.2	176	10	296.9	3	0	8.89	80	1014	10
6	7	11	192	13	6.2	0.147	0.416	0.005	423	129	-46.2	0.736	0.77	0.17	0.8	146	10	296.9	3	0	1.52	100	1014	10
6	7	11	192	14	15.3	0.154	0.579	0.005	457	139	-21.6	0.37	0.38	0.18	1	121	10	297.4	3	0	0.25	94	1013	10
6	7	11	192	15	24.4	0.15	0.701	0.005	510	134	-12.5	0.37	0.38	0.19	0.9	103	10	298.4	3	0	0	94	1012	10
6	7	11	192	16	16.7	0.155	0.655	0.005	606	141	-20.2	0.37	0.38	0.19	1	91	10	298.6	3	0	0	88	1012	10
6	7	11	192	17	5.7	0.166	0.466	0.005	640	156	-73	0.655	0.64	0.21	1	78	10	298.4	3	0	0	85	1012	10
6	7	11	192	18	0.1	0.104	0.121	0.005	638	78	-1017	0.655	0.64	0.33	0.7	67	10	297.9	3	0	0	88	1012	7
6	7	11	192	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	69	10	297.6	3	0	0	88	1013	7
6	7	11	192	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	297.5	3	0	0	91	1013	7
6	7	11	192	21	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	89	10	297.4	3	0	0	94	1014	7
6	7	11	192	22	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	76	10	297.4	3	0	0	94	1014	7
6	7	11	192	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	297.4	3	0	0	94	1014	7
6	7	11	192	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	297	3	0	0	94	1013	7
6	7	12	193	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	297.1	3	0	0	94	1013	7
6	7	12	193	2	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	70	10	297	3	0	0	97	1012	7
6	7	12	193	3	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	74	10	296.8	3	0	0	100	1013	7
6	7	12	193	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	296.6	3	0	0	98	1012	7
6	7	12	193	5	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	67	10	296.5	3	0	0.25	97	1013	7
6	7	12	193	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	91	10	296.9	3	0	0	94	1013	7
6	7	12	193	7	-2	0.099	-9	-9	-999	72	43.5	0.37	0.38	0.44	1.1	90	10	299	3	0	0	100	1014	0
6	7	12	193	8	52.8	0.198	0.677	0.007	212	203	-13.3	0.37	0.38	0.25	1.2	92	10	301.1	3	0	0	91	1014	0
6	7	12	193	9	61.1	0.224	0.792	0.006	294	243	-16.6	0.37	0.38	0.2	1.4	92	10	302.8	3	0	1.52	85	1014	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	12	193	10	126.4	0.242	1.172	0.005	461	274	-10.2	0.655	0.64	0.18	1.1	73	10	301.5	3	0	2.03	80	1014	7
6	7	12	193	11	75	0.147	1.053	0.005	563	132	-3.8	0.37	0.38	0.19	0.7	114	10	302.9	3	0	0.76	66	1014	9
6	7	12	193	12	46.3	0.281	0.926	0.005	618	343	-43.3	0.655	0.64	0.18	1.6	36	10	299	3	0	1.52	94	1014	10
6	7	12	193	13	31.9	0.208	0.836	0.005	661	219	-25.4	0.655	0.64	0.18	1.1	45	10	299	3	0	0.25	94	1013	10
6	7	12	193	14	21.3	0.16	0.741	0.005	690	148	-17.4	0.655	0.64	0.18	0.8	46	10	299.5	3	0	0	85	1012	10
6	7	12	193	15	26.8	0.204	0.814	0.005	727	212	-28.6	0.655	0.64	0.18	1.1	16	10	299.9	3	0	0	75	1012	10
6	7	12	193	16	21.2	0.173	0.81	0.005	902	166	-22	0.655	0.64	0.19	0.9	4	10	300	3	0	0	80	1011	10
6	7	12	193	17	4.9	0.126	0.499	0.005	906	103	-36.2	0.655	0.64	0.21	0.7	21	10	300.2	3	0	0	75	1011	10
6	7	12	193	18	0.1	0.098	0.136	0.005	905	71	-856.9	0.37	0.38	0.34	0.8	117	10	299.4	3	0	0	91	1011	7
6	7	12	193	19	-1.2	0.042	-9	-9	-999	21	5.5	0.37	0.38	1	0.7	122	10	298.6	3	0	0	94	1012	7
6	7	12	193	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	112	10	298.5	3	0	0	94	1012	7
6	7	12	193	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	113	10	298.4	3	0	0	94	1013	3
6	7	12	193	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	101	10	298.1	3	0	0	94	1013	3
6	7	12	193	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	98	10	297.9	3	0	0	97	1013	0
6	7	12	193	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	297.8	3	0	0	94	1012	3
6	7	13	194	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	80	10	297.4	3	0	0	94	1011	3
6	7	13	194	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	297.6	3	0	0	97	1011	7
6	7	13	194	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	72	10	297.8	3	0	0	94	1011	7
6	7	13	194	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	61	10	297.4	3	0	0	100	1011	7
6	7	13	194	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	49	10	297.1	3	0	0	97	1011	3
6	7	13	194	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	73	10	297.4	3	0	0	94	1012	7
6	7	13	194	7	-0.8	0.049	-9	-9	-999	25	12.4	0.37	0.38	0.44	0.8	93	10	299.1	3	0	0	94	1012	0
6	7	13	194	8	41.5	0.226	0.658	0.005	248	247	-25.1	0.37	0.38	0.25	1.5	118	10	301.8	3	0	0	91	1013	0
6	7	13	194	9	90.2	0.332	1.066	0.005	485	440	-36.6	0.37	0.38	0.2	2.3	121	10	303.4	3	0	0	80	1013	0
6	7	13	194	10	110.2	0.305	1.329	0.005	770	388	-23.2	0.37	0.38	0.19	2	119	10	304.5	3	0	0	70	1013	5
6	7	13	194	11	85.8	0.287	1.331	0.005	994	353	-24.8	0.37	0.38	0.19	1.9	118	10	304.8	3	0	0	64	1013	8
6	7	13	194	12	81	0.296	1.335	0.005	1062	371	-28.9	0.37	0.38	0.18	2	134	10	304.9	3	0	0	61	1012	9
6	7	13	194	13	87	0.331	1.398	0.005	1134	438	-37.6	0.37	0.38	0.18	2.3	120	10	304.1	3	0	0	62	1012	9
6	7	13	194	14	88	0.32	1.433	0.005	1208	417	-33.6	0.37	0.38	0.18	2.2	115	10	303.9	3	0	0	77	1011	8
6	7	13	194	15	56.1	0.298	1.25	0.005	1254	375	-42.6	0.37	0.38	0.19	2.1	120	10	303	3	0	0.51	66	1010	9
6	7	13	194	16	35.4	0.277	1.079	0.005	1281	336	-54.3	0.37	0.38	0.19	2	112	10	301.9	3	0	0	66	1010	10
6	7	13	194	17	7.2	0.176	0.636	0.005	1285	174	-68.8	0.37	0.38	0.22	1.3	105	10	300.8	3	0	0	91	1010	10
6	7	13	194	18	0.1	0.122	0.153	0.005	1284	99	-1642.5	0.37	0.38	0.34	1	103	10	300	3	0	0	85	1010	10
6	7	13	194	19	-2.1	0.055	-9	-9	-999	31	7.1	0.37	0.38	1	0.9	103	10	299.4	3	0	0	88	1011	7
6	7	13	194	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	108	10	298.6	3	0	0	91	1012	7
6	7	13	194	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	297.9	3	0	0.25	94	1012	7
6	7	13	194	22	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	87	10	298	3	0	0	94	1012	7
6	7	13	194	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	83	10	297.9	3	0	0	94	1012	7
6	7	13	194	24	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	122	10	297.5	3	0	0	94	1012	3
6	7	14	195	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	137	10	297.8	3	0	0	94	1012	3
6	7	14	195	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	297.9	3	0	1.27	97	1011	7
6	7	14	195	3	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	77	10	297.8	3	0	0	94	1011	7
6	7	14	195	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	59	10	297.4	3	0	0	94	1011	7
6	7	14	195	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	88	10	297.4	3	0	0	91	1011	7
6	7	14	195	6	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	80	10	297.6	3	0	0	88	1012	3
6	7	14	195	7	-1.3	0.061	-9	-9	-999	34	15	0.37	0.38	0.44	1	105	10	299	3	0	0	100	1012	0
6	7	14	195	8	44.7	0.217	0.653	0.005	225	232	-20.6	0.37	0.38	0.25	1.4	90	10	301.1	3	0	0	94	1013	0
6	7	14	195	9	44.8	0.271	0.734	0.005	319	325	-40.3	0.37	0.38	0.2	1.9	114	10	301.9	3	0	0	94	1013	9
6	7	14	195	10	45.5	0.272	0.806	0.005	415	326	-39.8	0.37	0.38	0.19	1.9	128	10	301.6	3	0	0	100	1013	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	14	195	11	42.2	0.27	0.839	0.005	505	323	-42.1	0.37	0.38	0.19	1.9	127	10	302.4	3	0	0	91	1013	10
6	7	14	195	12	27.6	0.229	0.754	0.005	560	253	-39.3	0.37	0.38	0.18	1.6	135	10	300.2	3	0	0.51	91	1013	10
6	7	14	195	13	14.9	0.154	0.625	0.005	591	140	-22	0.37	0.38	0.18	1	105	10	299.9	3	0	0	88	1012	10
6	7	14	195	14	27.8	0.175	0.795	0.005	651	168	-17.4	0.37	0.38	0.18	1.1	91	10	300.8	3	0	0	91	1011	10
6	7	14	195	15	40.5	0.247	0.94	0.005	738	283	-33.7	0.37	0.38	0.19	1.7	98	10	301.4	3	0	0	85	1010	10
6	7	14	195	16	34.1	0.255	0.912	0.005	802	296	-43.7	0.37	0.38	0.19	1.8	96	10	301.9	3	0	0	80	1010	10
6	7	14	195	17	18.4	0.233	0.746	0.005	815	258	-61.8	0.37	0.38	0.22	1.7	105	10	301.9	3	0	0	77	1011	10
6	7	14	195	18	0.1	0.134	0.131	0.005	813	116	-2178.2	0.37	0.38	0.34	1.1	96	10	300.2	3	0	0	85	1012	7
6	7	14	195	19	-3.1	0.067	-9	-9	-999	41	8.7	0.37	0.38	1	1.1	95	10	299.4	3	0	0	94	1012	7
6	7	14	195	20	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	83	10	298.9	3	0	0	88	1013	0
6	7	14	195	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	298.4	3	0	0	88	1014	7
6	7	14	195	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	298.1	3	0	0	88	1014	7
6	7	14	195	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	297.9	3	0	0	94	1014	7
6	7	14	195	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	297.6	3	0	0	88	1013	7
6	7	15	196	1	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	297.4	3	0	4.32	88	1013	7
6	7	15	196	2	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	109	10	297.5	3	0	0	97	1012	7
6	7	15	196	3	-5	0.085	-9	-9	-999	57	11	0.37	0.38	1	1.4	114	10	297.4	3	0	0.25	94	1012	7
6	7	15	196	4	-2.8	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	83	10	297.2	3	0	0	94	1012	7
6	7	15	196	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	42	10	296.9	3	0	0	94	1013	7
6	7	15	196	6	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	83	10	297.1	3	0	2.29	100	1014	0
6	7	15	196	7	4.9	0.125	0.174	0.008	39	102	-36.6	0.655	0.64	0.44	0.7	74	10	297.9	3	0	0.76	94	1014	6
6	7	15	196	8	28.1	0.186	0.488	0.006	149	184	-20.7	0.37	0.38	0.25	1.2	101	10	299.5	3	0	0	97	1014	8
6	7	15	196	9	60.5	0.246	0.732	0.005	234	280	-22.1	0.37	0.38	0.2	1.6	101	10	301.2	3	0	0.25	80	1014	8
6	7	15	196	10	83.5	0.297	0.933	0.005	352	372	-28.4	0.37	0.38	0.19	2	91	10	303	3	0	0	70	1014	8
6	7	15	196	11	105.6	0.358	1.291	0.005	738	493	-39.3	0.37	0.38	0.19	2.5	105	10	303.9	3	0	0	70	1014	8
6	7	15	196	12	104.5	0.336	1.344	0.005	840	448	-32.7	0.37	0.38	0.18	2.3	104	10	304.2	3	0	0	66	1013	8
6	7	15	196	13	89.5	0.332	1.299	0.005	885	440	-36.8	0.37	0.38	0.18	2.3	101	10	304.2	3	0	0	66	1013	9
6	7	15	196	14	86.8	0.342	1.307	0.005	928	459	-41.5	0.37	0.38	0.18	2.4	104	10	303.9	3	0	0	63	1012	9
6	7	15	196	15	68.9	0.346	1.225	0.005	962	469	-54.4	0.37	0.38	0.19	2.5	97	10	303.6	3	0	0	80	1012	9
6	7	15	196	16	28.1	0.262	0.913	0.005	975	311	-57.6	0.37	0.38	0.19	1.9	104	10	302.5	3	0	0	65	1012	10
6	7	15	196	17	12.4	0.227	0.697	0.005	980	249	-84.9	0.37	0.38	0.22	1.7	102	10	301.9	3	0	0	72	1012	10
6	7	15	196	18	0.1	0.134	0.14	0.005	978	116	-2178.9	0.37	0.38	0.34	1.1	104	10	300.5	3	0	0	75	1012	7
6	7	15	196	19	-2.2	0.059	-9	-9	-999	35	8.4	0.655	0.64	1	0.8	76	10	299.6	3	0	0	85	1013	7
6	7	15	196	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	299.4	3	0	0	88	1013	7
6	7	15	196	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	78	10	299	3	0	0	82	1013	7
6	7	15	196	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	298.8	3	0	0	82	1013	7
6	7	15	196	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	298.5	3	0	0	85	1013	7
6	7	15	196	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	72	10	298	3	0	0	88	1013	7
6	7	16	197	1	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	297.9	3	0	0	88	1012	7
6	7	16	197	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	297.8	3	0	0	88	1012	7
6	7	16	197	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	70	10	297.5	3	0	0	94	1012	7
6	7	16	197	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	297.6	3	0	0	94	1012	7
6	7	16	197	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	297.8	3	0	0	97	1012	7
6	7	16	197	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	297.9	3	0	0	100	1013	3
6	7	16	197	7	-2.4	0.135	-9	-9	-999	113	91.6	0.655	0.64	0.44	1.1	75	10	301.1	3	0	0	94	1013	0
6	7	16	197	8	82.1	0.309	0.781	0.007	210	395	-32.6	0.655	0.64	0.24	1.7	72	10	302.9	3	0	0	82	1014	0
6	7	16	197	9	89.3	0.266	0.928	0.007	323	317	-19.1	0.37	0.38	0.2	1.7	94	10	304.1	3	0	0	61	1014	0
6	7	16	197	10	128	0.297	1.198	0.006	486	372	-18.4	0.655	0.64	0.18	1.5	84	10	304.1	3	0	0	61	1013	8
6	7	16	197	11	131.3	0.299	1.335	0.005	655	377	-18.4	0.37	0.38	0.19	1.9	92	10	305.5	3	0	0	58	1013	6

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	16	197	12	115.2	0.284	1.368	0.005	802	349	-18	0.37	0.38	0.18	1.8	90	10	305.9	3	0	0	56	1012	7
6	7	16	197	13	97.7	0.257	1.337	0.005	883	301	-15.8	0.37	0.38	0.18	1.6	90	10	305.9	3	0	0	70	1012	8
6	7	16	197	14	71.1	0.293	1.251	0.005	994	364	-31.8	0.655	0.64	0.18	1.6	75	10	304.5	3	0	0	59	1011	10
6	7	16	197	15	26.4	0.239	0.911	0.005	1034	270	-46.7	0.37	0.38	0.19	1.7	102	10	303.8	3	0	0	54	1010	10
6	7	16	197	16	17.9	0.243	0.806	0.005	1054	276	-72.6	0.37	0.38	0.19	1.8	101	10	301.8	3	0	0	59	1011	10
6	7	16	197	17	5.9	0.247	0.558	0.005	1051	282	-228.7	0.655	0.64	0.21	1.6	82	10	298.9	3	0	0	91	1011	10
6	7	16	197	18	0.1	0.122	0.143	0.005	1049	106	-1644.7	0.37	0.38	0.34	1	119	10	298.4	3	0	0	88	1012	10
6	7	16	197	19	-0.9	0.036	-9	-9	-999	24	4.7	0.37	0.38	1	0.6	89	10	298.4	3	0	0	82	1012	7
6	7	16	197	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	84	10	298.5	3	0	0	94	1012	7
6	7	16	197	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	298	3	0	0	88	1012	7
6	7	16	197	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	107	10	297.8	3	0	0	94	1013	7
6	7	16	197	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	101	10	297.5	3	0	0	91	1012	7
6	7	16	197	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	118	10	297.5	3	0	0	100	1012	7
6	7	17	198	1	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	70	10	297.5	3	0	0	90	1011	7
6	7	17	198	2	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	84	10	297.4	3	0	0	97	1011	7
6	7	17	198	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	67	10	297.2	3	0	0	94	1011	7
6	7	17	198	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	78	10	296.9	3	0	0	94	1011	7
6	7	17	198	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.1	3	0	0	94	1012	7
6	7	17	198	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.8	3	0	0	94	1012	3
6	7	17	198	7	-1.2	0.067	-9	-9	-999	40	23.5	0.736	0.77	0.44	0.8	160	10	301.4	3	0	0	88	1013	0
6	7	17	198	8	104.3	0.301	1.334	0.005	823	380	-23.6	0.736	0.77	0.24	1.5	149	10	302.9	3	0	0	85	1013	0
6	7	17	198	9	120.6	0.347	1.475	0.005	963	470	-31.3	0.736	0.77	0.19	1.8	159	10	301.6	3	0	0.25	80	1013	6
6	7	17	198	10	129.6	0.336	1.587	0.006	1116	448	-26.4	0.736	0.77	0.18	1.7	159	10	302.9	3	0	0	85	1013	8
6	7	17	198	11	95.5	0.312	1.471	0.006	1206	401	-28.8	0.736	0.77	0.17	1.6	151	10	302.1	3	0	0	85	1013	9
6	7	17	198	12	145	0.326	1.741	0.006	1316	427	-21.5	0.736	0.77	0.17	1.6	143	10	303.9	3	0	0	80	1012	9
6	7	17	198	13	82.5	0.239	1.456	0.006	1351	271	-14.9	0.736	0.77	0.17	1.1	148	10	303.5	3	0	0	70	1011	10
6	7	17	198	14	61.7	0.246	1.331	0.006	1378	281	-21.8	0.37	0.38	0.18	1.6	123	10	304	3	0	0	66	1010	9
6	7	17	198	15	63	0.247	1.35	0.006	1406	282	-21.4	0.37	0.38	0.19	1.6	121	10	304.5	3	0	0	70	1010	9
6	7	17	198	16	34.8	0.255	1.112	0.006	1421	297	-43	0.37	0.38	0.19	1.8	114	10	303.8	3	0	0	70	1010	10
6	7	17	198	17	9.1	0.246	0.711	0.006	1423	280	-146.8	0.37	0.38	0.22	1.9	119	10	302.5	3	0	0	68	1010	10
6	7	17	198	18	0.1	0.158	0.158	0.006	1421	147	-3570.4	0.37	0.38	0.34	1.3	105	10	300.9	3	0	0	79	1010	7
6	7	17	198	19	-3.1	0.067	-9	-9	-999	44	8.7	0.37	0.38	1	1.1	102	10	299.9	3	0	0	85	1011	7
6	7	17	198	20	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	91	10	299.4	3	0	0	88	1012	3
6	7	17	198	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	101	10	299.2	3	0	0	88	1013	3
6	7	17	198	22	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	102	10	299.2	3	0	0	94	1013	3
6	7	17	198	23	-3.5	0.067	-9	-9	-999	40	7.6	0.37	0.38	1	1.1	107	10	299	3	0	0	91	1013	0
6	7	17	198	24	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	102	10	298.9	3	0	0	94	1012	3
6	7	18	199	1	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	99	10	298.8	3	0	0	94	1012	3
6	7	18	199	2	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	104	10	298.8	3	0	0	91	1012	3
6	7	18	199	3	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	107	10	298.6	3	0	0	94	1012	3
6	7	18	199	4	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	82	10	298.4	3	0	0	94	1012	3
6	7	18	199	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	69	10	298.1	3	0	0	91	1012	0
6	7	18	199	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	299.9	3	0	0	88	1013	7
6	7	18	199	7	-4.1	0.201	-9	-9	-999	208	180.4	0.37	0.38	0.45	1.8	112	10	301.4	3	0	0	85	1013	0
6	7	18	199	8	44.8	0.293	0.972	0.006	740	365	-50.7	0.37	0.38	0.25	2.1	116	10	302.4	3	0	0	82	1014	5
6	7	18	199	9	72.3	0.337	1.224	0.007	917	449	-47.8	0.37	0.38	0.2	2.4	120	10	303.1	3	0	0	75	1014	7
6	7	18	199	10	99	0.312	1.38	0.006	961	402	-27.9	0.37	0.38	0.19	2.1	121	10	304.4	3	0	0	80	1014	7
6	7	18	199	11	89.5	0.299	1.352	0.006	1000	376	-26.9	0.37	0.38	0.19	2	120	10	304.5	3	0	0	72	1014	8
6	7	18	199	12	91	0.288	1.378	0.005	1040	356	-23.8	0.37	0.38	0.18	1.9	132	10	304.8	3	0	0	80	1013	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	18	199	13	88.4	0.288	1.382	0.005	1079	355	-24.3	0.37	0.38	0.18	1.9	105	10	304.6	3	0	0	70	1012	9
6	7	18	199	14	58.7	0.256	1.219	0.005	1115	297	-25.7	0.37	0.38	0.18	1.7	107	10	302.8	3	0	1.78	68	1012	9
6	7	18	199	15	17.3	0.156	0.814	0.005	1123	145	-19.7	0.37	0.38	0.19	1	88	10	299.9	3	0	0.51	82	1012	10
6	7	18	199	16	19.5	0.158	0.85	0.005	1136	145	-18.4	0.655	0.64	0.19	0.8	80	10	300.1	3	0	0	85	1012	10
6	7	18	199	17	0.1	0.104	0.147	0.005	1135	78	-1016.7	0.655	0.64	0.21	0.7	77	10	299.9	3	0	0	82	1012	10
6	7	18	199	18	0.1	0.075	0.147	0.005	1135	47	-378.3	0.37	0.38	0.34	0.6	95	10	299.5	3	0	0	88	1013	7
6	7	18	199	19	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	89	10	299.2	3	0	0	88	1013	7
6	7	18	199	20	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	113	10	299	3	0	0	91	1014	7
6	7	18	199	21	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	169	10	299.2	3	0	0	94	1015	7
6	7	18	199	22	-5.2	0.092	-9	-9	-999	64	13.5	0.736	0.77	1	1.2	180	10	298.4	3	0	0	94	1015	7
6	7	18	199	23	-2.9	0.069	-9	-9	-999	42	10.1	0.736	0.77	1	0.9	174	10	297.4	3	0	0	94	1014	7
6	7	18	199	24	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	174	10	297.4	3	0	0	94	1014	7
6	7	19	200	1	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	155	10	297.8	3	0	0	94	1013	7
6	7	19	200	2	-1.3	0.046	-9	-9	-999	23	6.7	0.736	0.77	1	0.6	168	10	297.9	3	0	0	91	1013	7
6	7	19	200	3	-0.9	0.038	-9	-9	-999	17	5.6	0.736	0.77	1	0.5	150	10	298.1	3	0	0	94	1013	7
6	7	19	200	4	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	89	10	297.9	3	0	0	94	1014	7
6	7	19	200	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.8	3	0	0	94	1014	7
6	7	19	200	6	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	153	10	298.1	3	0	0	88	1014	7
6	7	19	200	7	-1.2	0.061	-9	-9	-999	35	17.5	0.736	0.77	0.44	0.8	176	10	300.8	3	0	0	94	1014	0
6	7	19	200	8	27.5	0.175	0.54	0.005	208	168	-17.5	0.37	0.38	0.25	1.1	135	10	301.1	3	0	0.51	94	1015	8
6	7	19	200	9	38.1	0.146	0.667	0.005	282	129	-7.4	0.37	0.38	0.2	0.8	106	10	300.5	3	0	7.11	85	1015	9
6	7	19	200	10	75.8	0.229	1.091	0.005	620	252	-14.3	0.37	0.38	0.19	1.4	113	10	302.6	3	0	0	85	1015	8
6	7	19	200	11	125.9	0.298	1.491	0.005	954	374	-19	0.37	0.38	0.19	1.9	113	10	304.6	3	0	0	70	1015	6
6	7	19	200	12	131.4	0.288	1.594	0.005	1117	355	-16.4	0.37	0.38	0.18	1.8	108	10	305.4	3	0	0	66	1014	7
6	7	19	200	13	94.8	0.279	1.462	0.005	1192	339	-20.7	0.37	0.38	0.18	1.8	126	10	305	3	0	0	61	1014	8
6	7	19	200	14	57.9	0.255	1.256	0.005	1237	297	-25.9	0.37	0.38	0.18	1.7	107	10	303.9	3	0	0	63	1013	9
6	7	19	200	15	28.4	0.197	0.997	0.005	1257	202	-24.2	0.37	0.38	0.19	1.3	94	10	302.6	3	0	0	65	1013	10
6	7	19	200	16	16.9	0.188	0.841	0.005	1270	188	-35.6	0.37	0.38	0.19	1.3	86	10	302.4	3	0	0	70	1013	10
6	7	19	200	17	2.6	0.145	0.451	0.005	1271	127	-105.1	0.37	0.38	0.22	1.1	101	10	301.4	3	0	0	72	1013	10
6	7	19	200	18	0.1	0.118	0.152	0.005	1269	94	-1500.3	0.655	0.64	0.33	0.8	76	10	300	3	0	0	74	1013	7
6	7	19	200	19	-2.1	0.055	-9	-9	-999	30	7.1	0.37	0.38	1	0.9	88	10	299.2	3	0	0	79	1013	7
6	7	19	200	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	96	10	298.8	3	0	0	85	1014	0
6	7	19	200	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	298.4	3	0	0	88	1014	7
6	7	19	200	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	298	3	0	0	88	1015	7
6	7	19	200	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	90	10	298	3	0	0	94	1014	0
6	7	19	200	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	297.9	3	0	0	94	1014	7
6	7	20	201	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	297.5	3	0	0	88	1013	7
6	7	20	201	2	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	86	10	297.4	3	0	0	82	1013	0
6	7	20	201	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	93	10	297.4	3	0	0	94	1013	7
6	7	20	201	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	297.4	3	0	0	94	1014	7
6	7	20	201	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	75	10	297.1	3	0	0	97	1014	0
6	7	20	201	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	297.8	3	0	0	94	1014	7
6	7	20	201	7	-1.1	0.055	-9	-9	-999	29	13.1	0.37	0.38	0.45	0.9	86	10	300.8	3	0	0	94	1014	0
6	7	20	201	8	51	0.22	0.662	0.005	206	237	-18.9	0.37	0.38	0.25	1.4	91	10	302.6	3	0	0	85	1015	0
6	7	20	201	9	82.2	0.231	0.932	0.005	356	255	-13.5	0.37	0.38	0.2	1.4	86	10	303.8	3	0	0	70	1015	5
6	7	20	201	10	83.9	0.276	1.057	0.005	509	333	-22.6	0.37	0.38	0.19	1.8	105	10	304	3	0	0	66	1015	8
6	7	20	201	11	103.4	0.292	1.314	0.005	795	363	-21.8	0.37	0.38	0.19	1.9	118	10	304.8	3	0	0	63	1015	8
6	7	20	201	12	127.7	0.309	1.472	0.005	904	396	-21	0.37	0.38	0.18	2	105	10	305.5	3	0	0	58	1014	7
6	7	20	201	13	120.3	0.286	1.508	0.005	1031	352	-17.5	0.37	0.38	0.18	1.8	102	10	305.9	3	0	0	61	1013	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	20	201	14	107.5	0.315	1.499	0.005	1133	406	-26.2	0.37	0.38	0.18	2.1	102	10	305.4	3	0	0	58	1012	8
6	7	20	201	15	77	0.284	1.363	0.005	1187	348	-26.8	0.37	0.38	0.19	1.9	94	10	304.9	3	0	0	56	1012	9
6	7	20	201	16	37.4	0.268	1.079	0.005	1211	318	-46.2	0.37	0.38	0.19	1.9	90	10	303.9	3	0	0	59	1012	10
6	7	20	201	17	4.1	0.204	0.516	0.005	1211	213	-188.5	0.37	0.38	0.22	1.6	98	10	302	3	0	0	61	1012	10
6	7	20	201	18	0.1	0.134	0.15	0.005	1208	114	-2180.4	0.37	0.38	0.34	1.1	88	10	300.6	3	0	0	67	1013	7
6	7	20	201	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	83	10	299.5	3	0	0	74	1013	7
6	7	20	201	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	298.8	3	0	0	79	1014	3
6	7	20	201	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	298.4	3	0	0	82	1014	3
6	7	20	201	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	102	10	298	3	0	0	88	1015	3
6	7	20	201	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	110	10	297.8	3	0	0	91	1014	0
6	7	20	201	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	297.4	3	0	0	94	1014	7
6	7	21	202	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	81	10	297.4	3	0	0	94	1013	7
6	7	21	202	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	297.1	3	0	0	90	1012	7
6	7	21	202	3	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297	3	0	0	90	1012	7
6	7	21	202	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	70	10	296.9	3	0	0	94	1013	7
6	7	21	202	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	68	10	296.8	3	0	0	90	1013	0
6	7	21	202	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	298.4	3	0	0	97	1013	7
6	7	21	202	7	-1.5	0.066	-9	-9	-999	39	17.9	0.655	0.64	0.45	0.9	76	10	301.1	3	0	0	88	1014	0
6	7	21	202	8	53.3	0.187	1.073	0.005	839	187	-11.2	0.37	0.38	0.25	1.1	111	10	302.9	3	0	0	77	1014	0
6	7	21	202	9	83	0.253	1.297	0.005	951	294	-17.7	0.37	0.38	0.2	1.6	125	10	303.9	3	0	0	80	1014	0
6	7	21	202	10	86.6	0.255	1.367	0.006	1069	295	-17.2	0.37	0.38	0.19	1.6	122	10	304.4	3	0	0	66	1014	8
6	7	21	202	11	102.1	0.281	1.503	0.006	1204	343	-19.6	0.37	0.38	0.19	1.8	116	10	304.6	3	0	0	68	1014	8
6	7	21	202	12	92	0.31	1.469	0.006	1246	398	-29.4	0.37	0.38	0.18	2.1	111	10	304.2	3	0	0	70	1013	9
6	7	21	202	13	70.8	0.249	1.358	0.006	1278	288	-19.8	0.37	0.38	0.18	1.6	119	10	304.5	3	0	0	49	1012	9
6	7	21	202	14	93.3	0.333	1.506	0.005	1321	442	-35.7	0.37	0.38	0.18	2.3	122	10	304.5	3	0	0	66	1012	8
6	7	21	202	15	69.1	0.292	1.373	0.005	1352	364	-32.5	0.37	0.38	0.19	2	113	10	304	3	0	0	52	1011	9
6	7	21	202	16	52.2	0.286	1.258	0.005	1376	351	-40.3	0.37	0.38	0.19	2	113	10	303.8	3	0	0	59	1011	9
6	7	21	202	17	6.4	0.197	0.624	0.005	1376	204	-108.5	0.37	0.38	0.22	1.5	117	10	301.8	3	0	0	65	1011	10
6	7	21	202	18	0.1	0.134	0.156	0.005	1375	114	-2178.2	0.37	0.38	0.34	1.1	106	10	300.4	3	0	0	74	1012	7
6	7	21	202	19	-1.6	0.049	-9	-9	-999	29	6.3	0.37	0.38	1	0.8	96	10	299.6	3	0	0	79	1012	7
6	7	21	202	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	89	10	299.2	3	0	0	88	1013	7
6	7	21	202	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	85	10	298.6	3	0	0	88	1013	7
6	7	21	202	22	-2.8	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	85	10	298.4	3	0	0	82	1014	7
6	7	21	202	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	89	10	297.9	3	0	0	88	1013	0
6	7	21	202	24	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	81	10	297.9	3	0	0	88	1013	7
6	7	22	203	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297.4	3	0	0	91	1012	3
6	7	22	203	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	80	10	297.4	3	0	0	94	1012	0
6	7	22	203	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	297.4	3	0	0	88	1012	7
6	7	22	203	4	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	105	10	297.5	3	0	0	94	1012	7
6	7	22	203	5	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	107	10	297.4	3	0	0	94	1012	0
6	7	22	203	6	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	94	10	298.9	3	0	0	94	1013	3
6	7	22	203	7	-3	0.126	-9	-9	-999	103	61	0.37	0.38	0.45	1.3	107	10	301.5	3	0	0	88	1013	0
6	7	22	203	8	47.5	0.273	0.911	0.005	577	327	-38.6	0.37	0.38	0.25	1.9	94	10	302.6	3	0	0	82	1014	0
6	7	22	203	9	80.9	0.307	1.166	0.005	708	391	-32.3	0.37	0.38	0.2	2.1	107	10	303.6	3	0	0	85	1014	5
6	7	22	203	10	101.4	0.346	1.322	0.005	825	468	-36.9	0.37	0.38	0.19	2.4	111	10	304.2	3	0	0	85	1013	6
6	7	22	203	11	125.8	0.396	1.476	0.005	924	572	-44.5	0.37	0.38	0.19	2.8	112	10	304.5	3	0	0	68	1013	6
6	7	22	203	12	116.2	0.361	1.484	0.005	1017	500	-36.6	0.37	0.38	0.18	2.5	98	10	304.9	3	0	0	70	1013	8
6	7	22	203	13	55.5	0.32	1.177	0.005	1060	416	-53	0.37	0.38	0.18	2.3	101	10	304	3	0	0	62	1012	10
6	7	22	203	14	63	0.312	1.246	0.005	1110	400	-43.4	0.37	0.38	0.18	2.2	105	10	304	3	0	0	61	1011	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	22	203	15	55.3	0.298	1.209	0.005	1153	374	-43.1	0.37	0.38	0.19	2.1	99	10	303.9	3	0	0	61	1011	9
6	7	22	203	16	39.8	0.28	1.093	0.005	1184	340	-49.6	0.37	0.38	0.19	2	93	10	303.5	3	0	0	70	1011	10
6	7	22	203	17	8.9	0.245	0.665	0.005	1189	280	-149.1	0.37	0.38	0.22	1.9	100	10	302.1	3	0	0	70	1011	10
6	7	22	203	18	0.1	0.146	0.149	0.005	1186	132	-2817.9	0.37	0.38	0.34	1.2	86	10	300.9	3	0	0	75	1012	7
6	7	22	203	19	-2.1	0.055	-9	-9	-999	35	7.1	0.37	0.38	1	0.9	96	10	300.1	3	0	0	79	1012	7
6	7	22	203	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	106	10	299.4	3	0	0	82	1013	7
6	7	22	203	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	71	10	299.1	3	0	0	88	1013	7
6	7	22	203	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	298.8	3	0	0	94	1013	7
6	7	22	203	23	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	85	10	298.5	3	0	0	94	1013	0
6	7	22	203	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	298.2	3	0	0	94	1013	7
6	7	23	204	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	95	10	298.1	3	0	0	94	1012	7
6	7	23	204	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	78	10	297.9	3	0	0	91	1012	0
6	7	23	204	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	297.9	3	0	0	88	1012	7
6	7	23	204	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	103	10	297.8	3	0	0	85	1011	7
6	7	23	204	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	111	10	297.6	3	0	0	82	1012	7
6	7	23	204	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	298.2	3	0	0	82	1012	7
6	7	23	204	7	-1.5	0.061	-9	-9	-999	34	13.3	0.37	0.38	0.45	1	92	10	299.9	3	0	0	88	1013	0
6	7	23	204	8	34.2	0.211	0.541	0.005	167	223	-24.9	0.37	0.38	0.25	1.4	86	10	301.2	3	0	0	88	1014	7
6	7	23	204	9	65.1	0.225	0.805	0.005	290	246	-15.8	0.37	0.38	0.2	1.4	112	10	300.8	3	0	2.54	70	1014	7
6	7	23	204	10	33.2	0.211	0.688	0.005	354	222	-25.4	0.37	0.38	0.19	1.4	104	10	302.1	3	0	0.25	66	1013	10
6	7	23	204	11	34.2	0.233	0.734	0.005	417	259	-33.5	0.37	0.38	0.19	1.6	102	10	301	3	0	0	85	1013	10
6	7	23	204	12	52.1	0.231	0.908	0.005	518	256	-21.4	0.37	0.38	0.18	1.5	102	10	301.9	3	0	0.25	75	1013	10
6	7	23	204	13	86.9	0.309	1.183	0.005	687	395	-30.6	0.37	0.38	0.18	2.1	102	10	304	3	0	0	56	1012	9
6	7	23	204	14	103.6	0.347	1.446	0.005	1054	470	-36.3	0.37	0.38	0.18	2.4	97	10	305	3	0	0	61	1011	8
6	7	23	204	15	70.6	0.293	1.334	0.005	1213	365	-32	0.37	0.38	0.19	2	99	10	304.6	3	0	0	58	1011	9
6	7	23	204	16	37.4	0.289	1.102	0.005	1293	358	-58.4	0.655	0.64	0.19	1.7	82	10	303.4	3	0	0	62	1011	10
6	7	23	204	17	12.6	0.205	0.77	0.005	1302	216	-61.7	0.37	0.38	0.22	1.5	88	10	302.4	3	0	0	72	1011	10
6	7	23	204	18	0.1	0.146	0.154	0.005	1300	129	-2817	0.37	0.38	0.34	1.2	92	10	301	3	0	0	75	1011	3
6	7	23	204	19	-4.6	0.081	-9	-9	-999	54	10.3	0.655	0.64	1	1.1	85	10	300.2	3	0	0	79	1012	3
6	7	23	204	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	80	10	299.5	3	0	0	79	1013	0
6	7	23	204	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	82	10	299.2	3	0	0	82	1013	7
6	7	23	204	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	298.9	3	0	0	82	1013	7
6	7	23	204	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	298.6	3	0	0	82	1013	7
6	7	23	204	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	298.4	3	0	0	82	1012	7
6	7	24	205	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	88	10	298.1	3	0	0	82	1012	7
6	7	24	205	2	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	86	10	297.9	3	0	0	88	1011	7
6	7	24	205	3	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	56	10	297.5	3	0	0	88	1011	7
6	7	24	205	4	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	3	0	0	88	1011	7
6	7	24	205	5	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	88	10	297.8	3	0	0	82	1011	7
6	7	24	205	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	298.6	3	0	0	88	1012	7
6	7	24	205	7	-3	0.117	-9	-9	-999	92	47.8	0.655	0.64	0.45	1.1	79	10	300.9	3	0	0	82	1012	0
6	7	24	205	8	62	0.263	1.126	0.005	832	310	-26.4	0.655	0.64	0.24	1.4	76	10	302.2	3	0	0	75	1013	2
6	7	24	205	9	87.8	0.298	1.302	0.005	907	375	-27.3	0.37	0.38	0.2	2	97	10	303.6	3	0	0	70	1013	0
6	7	24	205	10	106.6	0.336	1.434	0.005	999	449	-32.2	0.37	0.38	0.19	2.3	99	10	304.8	3	0	0	62	1013	6
6	7	24	205	11	103.5	0.336	1.461	0.005	1088	447	-32.9	0.37	0.38	0.19	2.3	109	10	305	3	0	0	66	1013	8
6	7	24	205	12	127.7	0.375	1.618	0.005	1199	527	-37.2	0.37	0.38	0.18	2.6	98	10	305.6	3	0	0	61	1012	7
6	7	24	205	13	116.5	0.35	1.613	0.005	1300	476	-33.1	0.37	0.38	0.18	2.4	98	10	305.8	3	0	0	62	1011	8
6	7	24	205	14	96.2	0.366	1.545	0.005	1383	510	-46	0.37	0.38	0.18	2.6	100	10	305.4	3	0	0	60	1010	8
6	7	24	205	15	71.9	0.337	1.423	0.005	1444	450	-47.8	0.37	0.38	0.19	2.4	107	10	304.8	3	0	0	58	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	24	205	16	38.7	0.29	1.166	0.005	1475	360	-56.7	0.37	0.38	0.19	2.1	98	10	303.9	3	0	0	58	1009	10
6	7	24	205	17	12.8	0.228	0.809	0.005	1484	251	-82.5	0.37	0.38	0.22	1.7	97	10	302.9	3	0	0	63	1009	10
6	7	24	205	18	0.1	0.162	0.16	0.005	1480	151	-3828.2	0.655	0.64	0.33	1.1	83	10	301.2	3	0	0	65	1010	3
6	7	24	205	19	-2.3	0.055	-9	-9	-999	38	6.3	0.37	0.38	1	0.9	87	10	300.4	3	0	0	70	1010	3
6	7	24	205	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	104	10	299.8	3	0	0	79	1011	0
6	7	24	205	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	103	10	299.4	3	0	0	82	1012	3
6	7	24	205	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	298.9	3	0	0	94	1012	3
6	7	24	205	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	111	10	298.5	3	0	0	91	1012	0
6	7	24	205	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	298.4	3	0	0	88	1011	3
6	7	25	206	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	116	10	298.1	3	0	0	88	1010	3
6	7	25	206	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	298	3	0	0.76	97	1009	7
6	7	25	206	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	83	10	297.9	3	0	0	94	1009	3
6	7	25	206	4	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	81	10	297.6	3	0	0	94	1009	3
6	7	25	206	5	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	71	10	297.2	3	0	0	94	1010	7
6	7	25	206	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	109	10	297.6	3	0	0	94	1010	3
6	7	25	206	7	-1.2	0.059	-9	-9	-999	33	14.6	0.655	0.64	0.45	0.8	56	10	300.8	3	0	0	88	1010	0
6	7	25	206	8	7.1	0.262	0.29	0.005	123	309	-228.9	0.655	0.64	0.24	1.7	84	10	298.6	3	0	0.25	85	1012	10
6	7	25	206	9	48.5	0.256	0.772	0.005	343	299	-31.4	0.655	0.64	0.19	1.4	82	10	298.4	3	0	0	94	1012	9
6	7	25	206	10	164.9	0.345	1.601	0.005	899	467	-22.5	0.655	0.64	0.18	1.8	80	10	303.1	3	0	0.25	74	1012	4
6	7	25	206	11	114.1	0.327	1.505	0.005	1081	431	-27.8	0.37	0.38	0.19	2.2	86	10	303.4	3	0	0	72	1012	7
6	7	25	206	12	68.8	0.226	1.314	0.005	1190	252	-15.2	0.37	0.38	0.18	1.4	94	10	302.9	3	0	0	70	1010	9
6	7	25	206	13	85.5	0.254	1.465	0.005	1328	295	-17.3	0.37	0.38	0.18	1.6	98	10	303.5	3	0	0	65	1010	9
6	7	25	206	14	80.9	0.322	1.484	0.005	1455	420	-37.1	0.655	0.64	0.18	1.8	69	10	302.9	3	0	0	72	1009	10
6	7	25	206	15	19.1	0.224	0.922	0.005	1474	247	-52.6	0.655	0.64	0.18	1.3	60	10	299	3	0	0.25	88	1009	10
6	7	25	206	16	10.3	0.187	0.754	0.005	1493	187	-57.5	0.655	0.64	0.19	1.1	63	10	299.6	3	0	0	82	1008	10
6	7	25	206	17	4.7	0.164	0.581	0.005	1500	153	-84.9	0.655	0.64	0.21	1	79	10	299.8	3	0	0	82	1009	10
6	7	25	206	18	0.1	0.104	0.161	0.005	1499	78	-1014.4	0.655	0.64	0.33	0.7	58	10	299.5	3	0	0	82	1009	7
6	7	25	206	19	-1.2	0.044	-9	-9	-999	22	6.3	0.655	0.64	1	0.6	58	10	299.1	3	0	0	77	1010	7
6	7	25	206	20	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	89	10	299	3	0	0	85	1010	7
6	7	25	206	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	63	10	298.4	3	0	0	82	1010	7
6	7	25	206	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	78	10	298.1	3	0	0	82	1010	7
6	7	25	206	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.9	3	0	0	82	1010	7
6	7	25	206	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	297.8	3	0	0	88	1010	7
6	7	26	207	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	297.6	3	0	0	94	1009	7
6	7	26	207	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	97	10	297.8	3	0	0	91	1009	0
6	7	26	207	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	297.9	3	0	0	94	1008	7
6	7	26	207	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	297.9	3	0	0	100	1009	3
6	7	26	207	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	65	10	297.4	3	0	0	97	1009	7
6	7	26	207	6	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	102	10	298.9	3	0	0	94	1009	0
6	7	26	207	7	-0.9	0.049	-9	-9	-999	25	11.2	0.37	0.38	0.46	0.8	97	10	301.9	3	0	0	88	1010	0
6	7	26	207	8	28.9	0.176	0.54	0.005	195	169	-16.9	0.37	0.38	0.25	1.1	115	10	302	3	0	0	80	1010	8
6	7	26	207	9	22.2	0.149	0.554	0.005	276	132	-13.3	0.37	0.38	0.2	0.9	127	10	300.4	3	0	0.51	85	1011	10
6	7	26	207	10	9.6	0.103	0.436	0.005	311	77	-10.4	0.37	0.38	0.19	0.6	93	10	299.4	3	0	17.02	85	1011	10
6	7	26	207	11	15.4	0.141	0.539	0.005	366	122	-16.5	0.655	0.64	0.18	0.7	67	10	298.6	3	0	6.6	82	1011	10
6	7	26	207	12	13.5	0.13	0.539	0.005	417	108	-14.7	0.37	0.38	0.18	0.8	116	10	299.5	3	0	0.51	85	1010	10
6	7	26	207	13	19.6	0.136	0.644	0.005	488	115	-11.5	0.37	0.38	0.18	0.8	102	10	299	3	0	0.25	85	1009	10
6	7	26	207	14	32.3	0.168	0.817	0.005	608	158	-13.1	0.655	0.64	0.18	0.8	49	10	299.9	3	0	0	94	1009	10
6	7	26	207	15	37.7	0.171	0.922	0.005	747	162	-11.9	0.655	0.64	0.18	0.8	81	10	300	3	0	0	94	1009	10
6	7	26	207	16	21.2	0.125	0.775	0.005	791	102	-8.3	0.37	0.38	0.19	0.7	110	10	300.5	3	0	0	88	1008	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	26	207	17	8.3	0.145	0.57	0.005	797	127	-33	0.655	0.64	0.21	0.8	68	10	300.1	3	0	0	82	1008	10
6	7	26	207	18	0.1	0.104	0.131	0.005	797	77	-1013	0.655	0.64	0.33	0.7	62	10	299.2	3	0	0	88	1008	7
6	7	26	207	19	-1.2	0.044	-9	-9	-999	22	6.3	0.655	0.64	1	0.6	73	10	298.9	3	0	0	94	1009	7
6	7	26	207	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	298.9	3	0	0	94	1010	7
6	7	26	207	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	298.8	3	0	0	88	1010	7
6	7	26	207	22	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	85	10	298.5	3	0	0	94	1010	7
6	7	26	207	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	91	10	298.4	3	0	0	100	1011	0
6	7	26	207	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	298.1	3	0	0	94	1011	7
6	7	27	208	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	64	10	297.9	3	0	0	94	1010	3
6	7	27	208	2	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	72	10	297.6	3	0	0	97	1010	7
6	7	27	208	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	101	10	297.8	3	0	0	100	1009	3
6	7	27	208	4	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	99	10	297.9	3	0	0	94	1010	3
6	7	27	208	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	297.9	3	0	0	97	1010	0
6	7	27	208	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	51	10	298.4	3	0	0	94	1010	7
6	7	27	208	7	-0.7	0.044	-9	-9	-999	21	10.7	0.655	0.64	0.45	0.6	63	10	300.9	3	0	0	94	1011	0
6	7	27	208	8	51	0.197	0.441	0.005	61	202	-13.6	0.37	0.38	0.25	1.2	112	10	302.9	3	0	0	85	1012	0
6	7	27	208	9	93.2	0.234	0.763	0.005	172	261	-12.4	0.37	0.38	0.2	1.4	111	10	304.5	3	0	0	75	1012	0
6	7	27	208	10	148.1	0.34	1.126	0.005	348	456	-24	0.736	0.77	0.18	1.7	158	10	303.9	3	0	0	66	1012	7
6	7	27	208	11	95.4	0.268	1.069	0.005	462	321	-18.2	0.37	0.38	0.19	1.7	138	10	303.8	3	0	0	68	1012	8
6	7	27	208	12	68	0.226	1.008	0.005	543	248	-15.3	0.37	0.38	0.18	1.4	97	10	303.9	3	0	0	75	1011	9
6	7	27	208	13	86.5	0.231	1.157	0.005	645	256	-12.9	0.655	0.64	0.18	1.1	61	10	303	3	0	1.27	88	1010	10
6	7	27	208	14	68.2	0.249	1.114	0.005	730	285	-20.3	0.37	0.38	0.18	1.6	114	10	304.4	3	0	0	72	1010	9
6	7	27	208	15	31.5	0.319	0.872	0.005	758	414	-92.6	0.37	0.38	0.19	2.4	97	10	300.8	3	0	14.99	80	1010	10
6	7	27	208	16	1.8	0.183	0.334	0.005	750	190	-310.3	0.655	0.64	0.19	1.2	80	10	296.8	3	0	0.25	94	1010	10
6	7	27	208	17	1.7	0.155	0.327	0.005	753	141	-202.6	0.655	0.64	0.21	1	79	10	297	3	0	0	94	1010	10
6	7	27	208	18	0.1	0.098	0.128	0.005	753	71	-856	0.37	0.38	0.34	0.8	94	10	296.9	3	0	0	94	1010	7
6	7	27	208	19	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	62	10	296.9	3	0	0	94	1010	7
6	7	27	208	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	63	10	297	3	0	0	94	1011	7
6	7	27	208	21	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	297.1	3	0	0	94	1011	7
6	7	27	208	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	85	10	297.1	3	0	0	94	1012	7
6	7	27	208	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297.2	3	0	0	97	1012	7
6	7	27	208	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	71	10	297.4	3	0	0	100	1012	7
6	7	28	209	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	297.4	3	0	0	94	1011	7
6	7	28	209	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	65	10	297.2	3	0	0	97	1011	0
6	7	28	209	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	56	10	297	3	0	0	100	1011	7
6	7	28	209	4	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	94	10	297	3	0	0	100	1011	7
6	7	28	209	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	100	10	296.9	3	0	0	97	1011	7
6	7	28	209	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	297.8	3	0	0	94	1011	7
6	7	28	209	7	-1	0.049	-9	-9	-999	25	10.3	0.37	0.38	0.46	0.8	90	10	300.6	3	0	0	94	1012	0
6	7	28	209	8	53.3	0.176	0.698	0.005	230	169	-9.2	0.37	0.38	0.25	1	110	10	302.9	3	0	0	88	1013	0
6	7	28	209	9	78.7	0.219	0.99	0.005	445	235	-12	0.37	0.38	0.2	1.3	134	10	304	3	0	0	80	1013	6
6	7	28	209	10	118.1	0.193	1.4	0.005	839	195	-5.5	0.37	0.38	0.19	1	116	10	305.4	3	0	0	70	1013	4
6	7	28	209	11	81	-9	-9	-9	924	-999	-99999	0.542	0.56	0.17	0	0	10	304.8	3	0	2.54	66	1012	9
6	7	28	209	12	63.1	0.203	1.199	0.005	986	210	-11.9	0.736	0.77	0.17	0.9	159	10	301.5	3	0	0.25	62	1012	10
6	7	28	209	13	32.6	0.195	0.972	0.005	1018	198	-20.4	0.655	0.64	0.18	1	6	10	300.4	3	0	0	88	1011	10
6	7	28	209	14	72.4	0.28	1.3	0.005	1093	341	-27.3	0.655	0.64	0.18	1.5	7	10	300.5	3	0	0.51	94	1010	10
6	7	28	209	15	118.4	0.24	1.601	0.006	1250	271	-10.6	0.655	0.64	0.18	1.1	39	10	302.6	3	0	0	80	1010	8
6	7	28	209	16	57	0.221	1.261	0.006	1268	239	-17	0.655	0.64	0.19	1.1	76	10	303.4	3	0	0	70	1010	9
6	7	28	209	17	11.4	0.163	0.739	0.006	1271	152	-34	0.655	0.64	0.21	0.9	55	10	302.6	3	0	0	70	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	28	209	18	0.1	0.118	0.152	0.006	1269	94	-1497.4	0.655	0.64	0.33	0.8	63	10	300.9	3	0	0	75	1010	7
6	7	28	209	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	88	10	300	3	0	0	79	1011	7
6	7	28	209	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	299.4	3	0	0	85	1012	7
6	7	28	209	21	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	91	10	299	3	0	0	82	1012	7
6	7	28	209	22	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	103	10	298.8	3	0	0	88	1012	7
6	7	28	209	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	94	10	298.5	3	0	0	91	1012	0
6	7	28	209	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	298.4	3	0	0	88	1012	3
6	7	29	210	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	298	3	0	0	88	1011	3
6	7	29	210	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297.9	3	0	0	97	1011	3
6	7	29	210	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	297.8	3	0	0	100	1011	3
6	7	29	210	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	53	10	297.4	3	0	0	94	1011	3
6	7	29	210	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	30	10	297.4	3	0	0	94	1011	7
6	7	29	210	6	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	64	10	298.5	3	0	0	94	1011	3
6	7	29	210	7	-1.2	0.059	-9	-9	-999	33	14.9	0.655	0.64	0.45	0.8	67	10	302.2	3	0	0	94	1012	0
6	7	29	210	8	43	0.183	0.936	0.005	689	180	-12.8	0.37	0.38	0.25	1.1	110	10	303.2	3	0	0	80	1012	0
6	7	29	210	9	84.8	0.254	1.23	0.005	793	295	-17.5	0.37	0.38	0.2	1.6	122	10	304.2	3	0	0	75	1013	4
6	7	29	210	10	117.9	0.252	1.435	0.006	907	290	-12.2	0.37	0.38	0.19	1.5	105	10	305.6	3	0	0	66	1013	0
6	7	29	210	11	123.9	0.287	1.501	0.006	987	353	-17.1	0.37	0.38	0.18	1.8	120	10	305.9	3	0	0	67	1012	6
6	7	29	210	12	140.8	0.254	1.612	0.006	1074	295	-10.5	0.736	0.77	0.17	1.1	164	10	303.5	3	0	2.29	70	1012	9
6	7	29	210	13	12.5	-9	-9	-9	1077	-999	-99999	0.542	0.56	0.16	0	0	10	298.2	3	0	13.72	70	1012	10
6	7	29	210	14	83.5	0.248	1.378	0.006	1131	283	-16.4	0.686	0.72	0.15	1.2	240	10	299.8	3	0	1.78	70	1011	10
6	7	29	210	15	55.8	0.237	1.218	0.006	1167	265	-21.4	0.686	0.72	0.15	1.2	232	10	300.4	3	0	0.25	88	1011	10
6	7	29	210	16	21.1	0.125	0.884	0.006	1181	107	-8.4	0.37	0.38	0.19	0.7	120	10	300.4	3	0	0	94	1010	10
6	7	29	210	17	24.4	0.176	0.932	0.006	1197	169	-20	0.655	0.64	0.21	0.9	60	10	301	3	0	0	94	1010	10
6	7	29	210	18	0.1	0.147	0.149	0.006	1193	130	-2888.9	0.655	0.64	0.33	1	78	10	298.8	3	0	0	88	1011	7
6	7	29	210	19	-1.6	0.049	-9	-9	-999	32	6.3	0.37	0.38	1	0.8	93	10	298.2	3	0	0	94	1012	7
6	7	29	210	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	298	3	0	0	91	1012	7
6	7	29	210	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	76	10	298	3	0	0	94	1013	7
6	7	29	210	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	93	10	298	3	0	0	94	1013	7
6	7	29	210	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	100	10	297.9	3	0	0	97	1013	7
6	7	29	210	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.9	3	0	0	94	1012	7
6	7	30	211	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	71	10	297.8	3	0	0	100	1012	7
6	7	30	211	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	297.6	3	0	0.25	97	1011	7
6	7	30	211	3	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	96	10	297.4	3	0	0.76	100	1011	7
6	7	30	211	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	297.2	3	0	0.25	100	1011	7
6	7	30	211	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	114	10	297	3	0	0	97	1011	7
6	7	30	211	6	-1.3	0.046	-9	-9	-999	23	6.7	0.736	0.77	1	0.6	143	10	297.8	3	0	0	100	1012	7
6	7	30	211	7	-0.3	0.049	-9	-9	-999	25	30.6	0.37	0.38	0.46	0.6	105	10	298.2	3	0	18.03	94	1012	10
6	7	30	211	8	17.3	-9	-9	-9	161	-999	-99999	0.542	0.56	0.23	0	0	10	298.4	3	0	8.64	91	1013	10
6	7	30	211	9	25.8	0.19	0.532	0.006	210	190	-23.8	0.265	0.28	0.16	1.4	259	10	299.9	3	0	0.51	88	1013	10
6	7	30	211	10	60.5	0.186	0.802	0.005	308	184	-9.5	0.265	0.28	0.14	1.2	260	10	301.6	3	0	0	85	1013	8
6	7	30	211	11	83.6	0.271	1.008	0.005	442	324	-21.4	0.655	0.64	0.18	1.4	346	10	301.4	3	0	0	77	1013	9
6	7	30	211	12	169.8	0.265	1.5	0.005	719	314	-9.9	0.655	0.64	0.18	1.2	355	10	303.5	3	0	0	88	1012	7
6	7	30	211	13	168	0.346	1.679	0.005	1017	468	-22.2	0.655	0.64	0.18	1.8	350	10	303.4	3	0	0	70	1012	8
6	7	30	211	14	18.1	0.248	0.802	0.005	1028	289	-76.5	0.655	0.64	0.18	1.5	9	10	300.4	3	0	11.68	66	1011	10
6	7	30	211	15	63.4	0.152	1.24	0.005	1085	140	-5	0.655	0.64	0.18	0.6	72	10	300.8	3	0	0	79	1010	10
6	7	30	211	16	25.4	0.128	0.921	0.005	1109	105	-7.4	0.37	0.38	0.19	0.7	134	10	301.9	3	0	0	70	1010	10
6	7	30	211	17	11.4	0.142	0.708	0.005	1117	122	-22.3	0.736	0.77	0.21	0.7	148	10	300.5	3	0	0	82	1011	10
6	7	30	211	18	0.1	0.075	0.146	0.005	1115	48	-377.8	0.37	0.38	0.34	0.6	136	10	299.9	3	0	0	79	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	7	30	211	19	-2	0.054	-9	-9	-999	29	7	0.736	0.77	1	0.7	148	10	299.4	3	0	0	82	1012	3
6	7	30	211	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	125	10	298.9	3	0	0	82	1012	0
6	7	30	211	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	298.6	3	0	0	82	1013	3
6	7	30	211	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	298.4	3	0	0	88	1013	3
6	7	30	211	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	125	10	298	3	0	0	91	1014	0
6	7	30	211	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	116	10	298.4	3	0	0	94	1013	7
6	7	31	212	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	298.1	3	0	0	100	1013	7
6	7	31	212	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	102	10	297.8	3	0	0	97	1012	0
6	7	31	212	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	123	10	297.4	3	0	0	100	1012	7
6	7	31	212	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	60	10	296.9	3	0	0	100	1012	7
6	7	31	212	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	62	10	296.6	3	0	0	97	1013	0
6	7	31	212	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	297.6	3	0	0	100	1013	3
6	7	31	212	7	-1.7	0.066	-9	-9	-999	39	15.5	0.655	0.64	0.45	0.9	81	10	300.9	3	0	0	94	1014	0
6	7	31	212	8	42.4	0.16	0.601	0.005	185	147	-8.7	0.37	0.38	0.25	0.9	98	10	301.9	3	0	0	88	1014	0
6	7	31	212	9	74.2	0.236	0.895	0.005	349	263	-15.9	0.736	0.77	0.19	1.1	160	10	302.8	3	0	1.02	88	1015	9
6	7	31	212	10	46.3	0.264	0.83	0.005	448	312	-36.1	0.736	0.77	0.18	1.4	146	10	300.8	3	0	0	91	1015	10
6	7	31	212	11	107.9	0.246	1.264	0.005	677	280	-12.4	0.736	0.77	0.17	1.1	180	10	302.8	3	0	0	94	1015	9
6	7	31	212	12	97.9	0.243	1.311	0.005	833	275	-13.2	0.736	0.77	0.17	1.1	188	10	302.6	3	0	0	85	1014	9
6	7	31	212	13	72.3	0.109	1.21	0.005	887	94	-1.6	0.265	0.28	0.14	0.5	329	10	304.4	3	0	0	80	1013	9
6	7	31	212	14	37.2	0.25	0.979	0.005	911	287	-37.9	0.655	0.64	0.18	1.4	359	10	302.2	3	0	0	77	1012	10
6	7	31	212	15	49.8	0.244	1.096	0.005	954	277	-26.3	0.655	0.64	0.18	1.3	15	10	302.4	3	0	0	80	1012	10
6	7	31	212	16	38.4	0.157	1.022	0.005	1001	146	-9.1	0.655	0.64	0.19	0.7	61	10	302	3	0	1.27	70	1012	10
6	7	31	212	17	4.4	0.177	0.497	0.005	1000	171	-112.5	0.655	0.64	0.21	1.1	48	10	299.2	3	0	10.67	82	1013	10
6	7	31	212	18	0.1	0.194	0.14	0.005	993	197	-6649.5	0.686	0.72	0.31	1.3	231	10	296.5	3	0	32.77	79	1014	7
6	7	31	212	19	-1.3	0.042	-9	-9	-999	58	5.5	0.37	0.38	1	0.7	109	10	296.8	3	0	0	88	1015	7
6	7	31	212	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	101	10	296.5	3	0	0	94	1015	7
6	7	31	212	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	296.8	3	0	0	94	1016	7
6	7	31	212	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	296.6	3	0	0	94	1016	7
6	7	31	212	23	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	85	10	296.2	3	0	0	97	1016	0
6	7	31	212	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	296.1	3	0	0	94	1015	7
6	8	1	213	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	133	10	296.2	3	0	0	100	1015	7
6	8	1	213	2	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	121	10	296.4	3	0	0	97	1015	3
6	8	1	213	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	128	10	296.2	3	0	0	100	1015	3
6	8	1	213	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	136	10	296.4	3	0	0	100	1015	3
6	8	1	213	5	-1	0.038	-9	-9	-999	17	4.9	0.736	0.77	1	0.5	144	10	296.4	3	0	0	97	1015	0
6	8	1	213	6	-1	0.038	-9	-9	-999	17	5	0.736	0.77	1	0.5	154	10	298.2	3	0	0	94	1016	3
6	8	1	213	7	-2.6	0.082	-9	-9	-999	54	19.7	0.37	0.38	0.46	1.2	125	10	301.2	3	0	0	94	1017	0
6	8	1	213	8	54.1	0.297	0.908	0.005	501	373	-44	0.37	0.38	0.25	2.1	138	10	302.2	3	0	0	82	1017	0
6	8	1	213	9	162.6	0.439	1.476	0.006	718	668	-47.1	0.736	0.77	0.19	2.4	142	10	303.6	3	0	0	75	1017	0
6	8	1	213	10	176.5	0.442	1.622	0.005	879	675	-44.3	0.736	0.77	0.18	2.4	146	10	304.4	3	0	0	75	1017	6
6	8	1	213	11	215.9	0.423	1.842	0.005	1051	633	-31.8	0.736	0.77	0.17	2.2	152	10	305.2	3	0	0	68	1016	5
6	8	1	213	12	198.5	0.42	1.878	0.005	1210	625	-33.7	0.736	0.77	0.17	2.2	156	10	305.8	3	0	0	58	1016	7
6	8	1	213	13	194.6	0.419	1.962	0.005	1409	624	-34.2	0.736	0.77	0.17	2.2	152	10	305.9	3	0	0	56	1015	7
6	8	1	213	14	168.3	0.413	1.941	0.005	1574	610	-37.8	0.736	0.77	0.17	2.2	159	10	305.8	3	0	0	56	1014	8
6	8	1	213	15	125.8	0.321	1.784	0.005	1634	422	-23.7	0.736	0.77	0.18	1.6	146	10	305.6	3	0	0	56	1014	9
6	8	1	213	16	41.4	0.28	1.236	0.005	1652	342	-48.2	0.37	0.38	0.19	2	127	10	304.6	3	0	0	56	1014	9
6	8	1	213	17	13	0.25	0.84	0.005	1655	287	-108.6	0.37	0.38	0.22	1.9	118	10	303.2	3	0	0	63	1014	10
6	8	1	213	18	0.1	0.17	0.166	0.005	1650	163	-4468.5	0.37	0.38	0.34	1.4	112	10	301	3	0	0	70	1015	3
6	8	1	213	19	-4.1	0.073	-9	-9	-999	50	8.5	0.37	0.38	1	1.2	101	10	299.9	3	0	0	74	1015	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	1	213	20	-3.6	0.067	-9	-9	-999	40	7.6	0.37	0.38	1	1.1	98	10	299.2	3	0	0	82	1016	0
6	8	1	213	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	82	10	298.6	3	0	0	77	1016	3
6	8	1	213	22	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	95	10	298.4	3	0	0	82	1016	7
6	8	1	213	23	-2.5	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	298.2	3	0	0	91	1016	3
6	8	1	213	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	297.9	3	0	0	88	1016	3
6	8	2	214	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	101	10	297.6	3	0	0	88	1015	3
6	8	2	214	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	101	10	297.9	3	0	0	94	1015	0
6	8	2	214	3	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	133	10	297.5	3	0	0	88	1015	3
6	8	2	214	4	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	120	10	297.6	3	0	0	88	1015	3
6	8	2	214	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	108	10	297.8	3	0	0	94	1015	3
6	8	2	214	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	298.8	3	0	0	94	1016	3
6	8	2	214	7	-1.9	0.067	-9	-9	-999	40	14.2	0.37	0.38	0.46	1.1	105	10	301.9	3	0	0	82	1016	0
6	8	2	214	8	69.5	0.314	1.016	0.005	547	405	-40.4	0.37	0.38	0.25	2.2	135	10	303.1	3	0	0	80	1016	0
6	8	2	214	9	93	0.365	1.234	0.005	733	507	-47.4	0.37	0.38	0.2	2.6	132	10	304	3	0	0	94	1016	0
6	8	2	214	10	124.4	0.361	1.486	0.005	958	500	-34.4	0.736	0.77	0.18	1.9	141	10	304.2	3	0	0	75	1016	8
6	8	2	214	11	118.4	0.307	1.518	0.005	1071	393	-22.1	0.37	0.38	0.18	2	134	10	304.6	3	0	0	68	1016	7
6	8	2	214	12	112.1	0.305	1.552	0.005	1209	388	-23	0.37	0.38	0.18	2	129	10	304.4	3	0	0	66	1015	8
6	8	2	214	13	113.8	0.306	1.595	0.005	1292	389	-22.7	0.37	0.38	0.18	2	120	10	305.2	3	0	0	66	1014	8
6	8	2	214	14	65.3	0.291	1.339	0.005	1332	361	-34	0.37	0.38	0.18	2	119	10	303.5	3	0	0	61	1014	9
6	8	2	214	15	76.8	0.306	1.432	0.005	1382	389	-33.6	0.37	0.38	0.19	2.1	120	10	304.4	3	0	0	58	1013	9
6	8	2	214	16	33.7	0.255	1.093	0.005	1403	296	-44.3	0.37	0.38	0.19	1.8	115	10	303.9	3	0	0	59	1013	10
6	8	2	214	17	9	0.223	0.706	0.005	1406	243	-111.1	0.37	0.38	0.22	1.7	110	10	302.4	3	0	0	63	1013	10
6	8	2	214	18	0.1	0.146	0.157	0.005	1404	130	-2823.6	0.37	0.38	0.34	1.2	102	10	301.1	3	0	0	70	1014	3
6	8	2	214	19	-2.3	0.055	-9	-9	-999	34	6.3	0.37	0.38	1	0.9	106	10	299.9	3	0	0	79	1014	3
6	8	2	214	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	68	10	299.4	3	0	0	85	1015	0
6	8	2	214	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	60	10	298.6	3	0	0	88	1015	3
6	8	2	214	22	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	87	10	298.4	3	0	0	82	1015	3
6	8	2	214	23	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	97	10	298.2	3	0	0	88	1015	0
6	8	2	214	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	99	10	298	3	0	0	94	1014	3
6	8	3	215	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	297.9	3	0	0	94	1014	3
6	8	3	215	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	75	10	297.9	3	0	0	97	1013	0
6	8	3	215	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	297.5	3	0	0	94	1013	3
6	8	3	215	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	73	10	297.5	3	0	0	100	1013	3
6	8	3	215	5	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	101	10	297.6	3	0	0	94	1014	0
6	8	3	215	6	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	97	10	298.6	3	0	0	94	1014	3
6	8	3	215	7	-4.1	0.127	-9	-9	-999	104	44.9	0.37	0.38	0.46	1.4	95	10	301	3	0	0	88	1014	0
6	8	3	215	8	53.3	0.232	0.948	0.006	578	257	-21.1	0.37	0.38	0.25	1.5	100	10	302.9	3	0	0	82	1015	0
6	8	3	215	9	79.8	0.274	1.15	0.006	689	330	-23.4	0.37	0.38	0.2	1.8	105	10	303.8	3	0	0	70	1015	6
6	8	3	215	10	89	0.266	1.26	0.007	814	316	-19.2	0.37	0.38	0.19	1.7	103	10	304.2	3	0	0	61	1015	8
6	8	3	215	11	133.9	0.3	1.492	0.006	898	378	-18.2	0.37	0.38	0.18	1.9	109	10	305.8	3	0	0.51	57	1015	6
6	8	3	215	12	133.1	0.3	1.533	0.006	980	377	-18.3	0.37	0.38	0.18	1.9	100	10	306.2	3	0	0	56	1015	7
6	8	3	215	13	100.1	0.28	1.423	0.005	1041	342	-19.9	0.37	0.38	0.18	1.8	113	10	305.6	3	0	0	50	1014	8
6	8	3	215	14	95.2	0.29	1.425	0.005	1100	359	-23.1	0.37	0.38	0.18	1.9	106	10	305.9	3	0	0	56	1013	8
6	8	3	215	15	77.3	0.263	1.349	0.005	1147	310	-21.2	0.37	0.38	0.19	1.7	101	10	305.5	3	0	0	56	1013	9
6	8	3	215	16	43.9	0.26	1.125	0.005	1173	305	-36.2	0.37	0.38	0.19	1.8	105	10	304.6	3	0	0	56	1013	9
6	8	3	215	17	6.7	0.187	0.603	0.005	1174	187	-87	0.37	0.38	0.22	1.4	105	10	302.8	3	0	0	65	1013	10
6	8	3	215	18	0.1	0.158	0.148	0.005	1171	145	-3579.9	0.37	0.38	0.34	1.3	105	10	300.9	3	0	0	65	1013	3
6	8	3	215	19	-2.3	0.055	-9	-9	-999	37	6.3	0.37	0.38	1	0.9	106	10	299.9	3	0	0	74	1013	3
6	8	3	215	20	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	93	10	299.4	3	0	0	77	1014	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	3	215	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	298.8	3	0	0	82	1014	3
6	8	3	215	22	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	84	10	298.4	3	0	0	82	1014	0
6	8	3	215	23	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	297.9	3	0	0	94	1014	3
6	8	3	215	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	297.4	3	0	0	88	1013	3
6	8	4	216	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	109	10	297.2	3	0	0	94	1012	3
6	8	4	216	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	81	10	297	3	0	0	100	1012	0
6	8	4	216	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	296.9	3	0	0	100	1012	3
6	8	4	216	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	296.8	3	0	0	97	1012	3
6	8	4	216	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	32	10	296.5	3	0	0	93	1012	0
6	8	4	216	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	55	10	297.6	3	0	0	97	1012	3
6	8	4	216	7	-1.4	0.059	-9	-9	-999	33	13.4	0.655	0.64	0.46	0.8	82	10	301	3	0	0	94	1012	0
6	8	4	216	8	61.3	0.213	0.735	0.006	234	225	-14.2	0.37	0.38	0.25	1.3	106	10	302.9	3	0	0	82	1013	0
6	8	4	216	9	101.7	0.281	1.039	0.005	398	342	-19.7	0.37	0.38	0.2	1.8	119	10	304.4	3	0	0	70	1014	0
6	8	4	216	10	100.5	0.247	1.16	0.006	561	283	-13.6	0.37	0.38	0.19	1.5	128	10	304.9	3	0	0	61	1014	7
6	8	4	216	11	121.4	0.252	1.366	0.006	760	292	-12	0.37	0.38	0.18	1.5	121	10	305.6	3	0	0	56	1013	7
6	8	4	216	12	73.7	0.133	1.206	0.008	858	118	-2.9	0.37	0.38	0.18	0.6	119	10	305.5	3	0	0	54	1012	9
6	8	4	216	13	24.4	0.139	0.843	0.008	885	119	-9.8	0.265	0.28	0.14	0.9	310	10	303.6	3	0	0	52	1011	10
6	8	4	216	14	21	0.093	0.809	0.008	909	66	-3.5	0.265	0.28	0.14	0.5	252	10	303	3	0	0	49	1010	10
6	8	4	216	15	1.2	0.113	0.311	0.008	903	87	-107.7	0.655	0.64	0.18	0.7	340	10	299.2	3	0	14.22	52	1010	10
6	8	4	216	16	1	0.166	0.289	0.008	903	156	-430.7	0.655	0.64	0.19	1.1	6	10	298.9	3	0	0	56	1010	10
6	8	4	216	17	0.1	0.09	0.136	0.008	904	63	-652.2	0.655	0.64	0.21	0.6	63	10	299.1	3	0	0	65	1010	10
6	8	4	216	18	0.1	0.098	0.136	0.008	903	71	-856.6	0.37	0.38	0.34	0.8	86	10	298.9	3	0	0	72	1010	3
6	8	4	216	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	104	10	298.8	3	0	0	74	1011	3
6	8	4	216	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	88	10	298.4	3	0	0	79	1012	0
6	8	4	216	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	73	10	298	3	0	0	79	1012	3
6	8	4	216	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	297.8	3	0	0	85	1013	3
6	8	4	216	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	91	10	297	3	0	0	85	1012	0
6	8	4	216	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	296.9	3	0	0	90	1011	3
6	8	5	217	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	88	10	296.8	3	0	0	90	1011	3
6	8	5	217	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	120	10	296.8	3	0	0	87	1010	0
6	8	5	217	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	296.5	3	0	0	97	1010	3
6	8	5	217	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	109	10	296.6	3	0	0	97	1011	3
6	8	5	217	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	107	10	296.4	3	0	0	93	1011	0
6	8	5	217	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	89	10	297.9	3	0	0	97	1011	3
6	8	5	217	7	-1.1	0.051	-9	-9	-999	27	11.5	0.655	0.64	0.46	0.7	78	10	300.8	3	0	0	94	1012	0
6	8	5	217	8	64.8	0.168	1.12	0.008	782	159	-6.6	0.37	0.38	0.25	0.9	98	10	302.9	3	0	0	79	1012	0
6	8	5	217	9	83.5	0.197	1.238	0.007	820	201	-8.3	0.37	0.38	0.2	1.1	126	10	303.9	3	0	0	70	1012	5
6	8	5	217	10	100.6	0.202	1.337	0.007	858	208	-7.4	0.37	0.38	0.19	1.1	121	10	305	3	0	0	65	1012	7
6	8	5	217	11	155.1	0.154	1.579	0.005	917	139	-2.1	0.655	0.64	0.18	0.5	62	10	306.2	3	0	0	61	1012	8
6	8	5	217	12	49	0.128	1.083	0.005	935	105	-3.8	0.265	0.28	0.14	0.7	330	10	304.5	3	0	0	54	1011	10
6	8	5	217	13	24.5	0.139	0.862	0.005	944	119	-9.8	0.265	0.28	0.14	0.9	264	10	303.9	3	0	0	54	1010	10
6	8	5	217	14	22.7	0.227	0.843	0.005	951	248	-46.2	0.655	0.64	0.18	1.3	355	10	302.2	3	0	0	52	1009	10
6	8	5	217	15	76.9	0.214	1.279	0.005	980	228	-11.5	0.655	0.64	0.18	1	334	10	302.5	3	0	0	56	1009	9
6	8	5	217	16	18.5	0.092	0.797	0.005	987	73	-3.7	0.265	0.28	0.15	0.5	327	10	302.4	3	0	0	66	1009	10
6	8	5	217	17	0.1	0.104	0.14	0.005	986	77	-1014	0.655	0.64	0.21	0.7	354	10	300.4	3	0	0	61	1009	10
6	8	5	217	18	0.1	0.09	0.14	0.005	985	62	-652	0.655	0.64	0.34	0.6	42	10	299.8	3	0	0	67	1010	3
6	8	5	217	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	81	10	299.6	3	0	0	74	1010	3
6	8	5	217	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	100	10	298.9	3	0	0	79	1011	3
6	8	5	217	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	92	10	298.4	3	0	0	69	1012	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	5	217	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	297.9	3	0	0	82	1012	3
6	8	5	217	23	-4.7	0.081	-9	-9	-999	53	10	0.655	0.64	1	1.1	85	10	297.6	3	0	0	82	1012	0
6	8	5	217	24	-3.8	0.073	-9	-9	-999	46	9.3	0.655	0.64	1	1	71	10	297.2	3	0	0	84	1011	3
6	8	6	218	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	78	10	296.8	3	0	0	84	1010	3
6	8	6	218	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	82	10	296.8	3	0	0	93	1010	0
6	8	6	218	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	71	10	296.4	3	0	0	90	1010	3
6	8	6	218	4	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	49	10	296.2	3	0	0	97	1010	3
6	8	6	218	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	296.4	3	0	0	93	1010	3
6	8	6	218	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	298.4	3	0	0	97	1011	3
6	8	6	218	7	-1	0.051	-9	-9	-999	27	12	0.655	0.64	0.46	0.7	70	10	301.9	3	0	0	88	1011	0
6	8	6	218	8	78.8	0.215	1.065	0.005	552	229	-11.4	0.655	0.64	0.24	1	82	10	303.4	3	0	0	77	1012	0
6	8	6	218	9	78.7	0.219	1.148	0.005	693	235	-12	0.37	0.38	0.2	1.3	99	10	304	3	0	0	70	1012	6
6	8	6	218	10	81.7	0.231	1.249	0.005	862	255	-13.5	0.37	0.38	0.19	1.4	112	10	304.6	3	0	0	66	1012	8
6	8	6	218	11	124.1	0.264	1.571	0.006	1129	312	-13.4	0.37	0.38	0.18	1.6	97	10	306.2	3	0	0	62	1011	7
6	8	6	218	12	95.3	0.235	1.46	0.005	1178	262	-12.2	0.37	0.38	0.18	1.4	103	10	306.1	3	0	0	58	1010	8
6	8	6	218	13	85.5	0.258	1.425	0.005	1221	301	-18.1	0.655	0.64	0.18	1.3	352	10	304.4	3	0	0	56	1010	10
6	8	6	218	14	134.2	0.312	1.686	0.005	1289	400	-20.3	0.655	0.64	0.18	1.6	358	10	304.4	3	0	0	52	1010	8
6	8	6	218	15	80.1	0.241	1.436	0.005	1333	274	-15.8	0.37	0.38	0.19	1.5	94	10	306.2	3	0	0	54	1009	8
6	8	6	218	16	30.3	0.231	1.043	0.005	1347	255	-36.6	0.37	0.38	0.19	1.6	96	10	304.8	3	0	0	56	1009	10
6	8	6	218	17	13.1	0.174	0.789	0.005	1352	167	-36	0.37	0.38	0.22	1.2	101	10	303.5	3	0	0	59	1009	10
6	8	6	218	18	0.1	0.118	0.156	0.005	1349	94	-1495.9	0.655	0.64	0.34	0.8	73	10	301.8	3	0	0	65	1009	3
6	8	6	218	19	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	71	10	300.8	3	0	0	67	1010	3
6	8	6	218	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	300	3	0	0	72	1011	3
6	8	6	218	21	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	111	10	299	3	0	0.25	77	1011	3
6	8	6	218	22	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	298.4	3	0	0	82	1012	3
6	8	6	218	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	102	10	298.4	3	0	0	88	1011	3
6	8	6	218	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	102	10	298.2	3	0	0	94	1010	3
6	8	7	219	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	297.9	3	0	0	94	1009	7
6	8	7	219	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	297.9	3	0	0	97	1009	7
6	8	7	219	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	298	3	0	0	94	1009	3
6	8	7	219	4	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	97	10	298	3	0	1.27	94	1009	7
6	8	7	219	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	96	10	297.9	3	0	0	97	1009	0
6	8	7	219	6	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	90	10	298.9	3	0	0.25	94	1010	7
6	8	7	219	7	-2	0.067	-9	-9	-999	40	13.7	0.37	0.38	0.47	1.1	100	10	301.5	3	0	0	94	1010	0
6	8	7	219	8	52.2	0.22	1.062	0.005	826	238	-18.5	0.37	0.38	0.25	1.4	88	10	303.2	3	0	0	88	1011	0
6	8	7	219	9	66.3	0.248	1.193	0.005	923	284	-20.7	0.37	0.38	0.2	1.6	106	10	303.8	3	0	0	85	1011	7
6	8	7	219	10	94.4	0.3	1.406	0.005	1062	378	-25.9	0.37	0.38	0.19	2	100	10	305.1	3	0	0	75	1010	7
6	8	7	219	11	35.8	0.267	1.034	0.005	1111	317	-47.7	0.37	0.38	0.18	1.9	91	10	302	3	0	0	80	1010	10
6	8	7	219	12	99.6	0.28	1.515	0.005	1260	341	-19.9	0.37	0.38	0.18	1.8	114	10	304.4	3	0	0	75	1009	8
6	8	7	219	13	56.1	0.287	1.266	0.005	1303	354	-38.1	0.37	0.38	0.18	2	91	10	302.4	3	0	3.3	75	1009	10
6	8	7	219	14	35.5	0.245	1.092	0.005	1319	279	-37.2	0.37	0.38	0.18	1.7	97	10	301.2	3	0	0	77	1008	10
6	8	7	219	15	52.3	0.221	1.25	0.005	1343	238	-18.4	0.37	0.38	0.19	1.4	98	10	302.9	3	0	0	78	1007	9
6	8	7	219	16	43.3	0.271	1.18	0.005	1363	324	-41.2	0.37	0.38	0.19	1.9	104	10	303.4	3	0	0	80	1007	9
6	8	7	219	17	17.1	0.199	0.866	0.005	1369	206	-41.6	0.37	0.38	0.22	1.4	133	10	301.5	3	0	0	85	1008	10
6	8	7	219	18	0.1	0.146	0.156	0.005	1368	129	-2809.6	0.37	0.38	0.35	1.2	119	10	300.1	3	0	0.76	80	1008	10
6	8	7	219	19	-1.2	0.042	-9	-9	-999	30	5.5	0.37	0.38	1	0.7	104	10	299.2	3	0	0	88	1009	7
6	8	7	219	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	107	10	299	3	0	0	91	1010	7
6	8	7	219	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	298.9	3	0	0	94	1010	7
6	8	7	219	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	73	10	298.5	3	0	0	94	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	7	219	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	80	10	298.5	3	0	0	91	1010	7
6	8	7	219	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	63	10	298.2	3	0	0	94	1009	3
6	8	8	220	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	298	3	0	0	94	1009	3
6	8	8	220	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	297.9	3	0	0	94	1009	7
6	8	8	220	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	297.9	3	0	0	94	1009	3
6	8	8	220	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	81	10	297.8	3	0	0	94	1009	3
6	8	8	220	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	74	10	297.5	3	0	0	100	1009	0
6	8	8	220	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	106	10	297.9	3	0	0	94	1010	3
6	8	8	220	7	-2.4	0.073	-9	-9	-999	45	14.6	0.37	0.38	0.47	1.2	102	10	301.1	3	0	0	94	1010	0
6	8	8	220	8	58	0.245	0.705	0.005	217	278	-22.8	0.37	0.38	0.25	1.6	100	10	303.1	3	0	0	80	1010	0
6	8	8	220	9	85.7	0.287	1	0.005	421	353	-24.8	0.37	0.38	0.2	1.9	118	10	304.2	3	0	0	75	1011	0
6	8	8	220	10	124.6	0.335	1.346	0.007	706	445	-27.1	0.736	0.77	0.18	1.7	152	10	304.4	3	0	0	66	1011	8
6	8	8	220	11	41.9	0.259	0.943	0.007	721	306	-37.5	0.37	0.38	0.18	1.8	132	10	301.5	3	0	7.37	62	1011	10
6	8	8	220	12	66.8	0.248	1.199	0.007	930	284	-20.6	0.37	0.38	0.18	1.6	116	10	300.9	3	0	0.25	62	1010	9
6	8	8	220	13	92.8	0.234	1.354	0.006	963	261	-12.4	0.37	0.38	0.18	1.4	109	10	303.1	3	0	0	54	1009	9
6	8	8	220	14	96	0.246	1.385	0.006	997	280	-13.9	0.37	0.38	0.18	1.5	112	10	304.9	3	0	0	60	1009	8
6	8	8	220	15	69.4	0.281	1.253	0.005	1021	343	-28.9	0.37	0.38	0.19	1.9	101	10	304.6	3	0	0	58	1008	9
6	8	8	220	16	40	0.269	1.048	0.005	1034	321	-43.7	0.37	0.38	0.19	1.9	116	10	304.2	3	0	0	66	1008	10
6	8	8	220	17	5.6	0.196	0.544	0.005	1035	201	-121.2	0.37	0.38	0.22	1.5	103	10	302.9	3	0	0	65	1008	10
6	8	8	220	18	0.1	0.146	0.142	0.005	1033	129	-2811.4	0.37	0.38	0.35	1.2	106	10	301.2	3	0	0	65	1009	3
6	8	8	220	19	-4.1	0.073	-9	-9	-999	47	8.5	0.37	0.38	1	1.2	97	10	300.1	3	0	0	79	1009	3
6	8	8	220	20	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	299.5	3	0	0	82	1010	3
6	8	8	220	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	82	10	298.9	3	0	0	82	1011	3
6	8	8	220	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	99	10	298.6	3	0	0	88	1012	3
6	8	8	220	23	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	109	10	298.5	3	0	0	85	1012	3
6	8	8	220	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	298.6	3	0	0	94	1011	3
6	8	9	221	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	298.2	3	0	0	100	1010	3
6	8	9	221	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	89	10	298	3	0	0	94	1009	7
6	8	9	221	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	297.9	3	0	0	100	1009	7
6	8	9	221	4	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	73	10	297.6	3	0	0	94	1009	3
6	8	9	221	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	297.6	3	0	0	94	1009	3
6	8	9	221	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	100	10	298.9	3	0	0	94	1010	3
6	8	9	221	7	-1.3	0.055	-9	-9	-999	29	11.2	0.37	0.38	0.47	0.9	94	10	301.9	3	0	0	94	1010	0
6	8	9	221	8	54.6	0.199	0.991	0.005	642	204	-13	0.37	0.38	0.25	1.2	100	10	303.4	3	0	0	80	1010	0
6	8	9	221	9	85	0.221	1.315	0.005	965	238	-11.4	0.37	0.38	0.2	1.3	116	10	304.5	3	0	0	77	1010	5
6	8	9	221	10	97.1	0.224	1.413	0.005	1049	244	-10.4	0.37	0.38	0.19	1.3	108	10	305.6	3	0	0	75	1010	7
6	8	9	221	11	125.2	0.275	1.572	0.005	1121	333	-15	0.37	0.38	0.18	1.7	97	10	305.9	3	0	0	62	1010	6
6	8	9	221	12	113.2	0.247	1.551	0.005	1189	283	-12	0.736	0.77	0.17	1.1	142	10	304.5	3	0	0.25	56	1010	9
6	8	9	221	13	6.5	0.102	0.6	0.005	1190	90	-14.4	0.265	0.28	0.14	0.7	311	10	300.8	3	0	2.29	75	1009	10
6	8	9	221	14	17.8	0.222	0.841	0.005	1200	241	-55.5	0.655	0.64	0.18	1.3	354	10	299.9	3	0	0	77	1009	10
6	8	9	221	15	36.4	0.142	1.074	0.005	1223	124	-7	0.655	0.64	0.18	0.6	35	10	301	3	0	0	70	1008	10
6	8	9	221	16	34.8	0.146	1.064	0.005	1246	128	-8	0.736	0.77	0.18	0.6	205	10	302	3	0	0	80	1008	10
6	8	9	221	17	3.1	0.095	0.475	0.005	1245	67	-24.7	0.655	0.64	0.22	0.5	57	10	300	3	0	6.35	91	1008	10
6	8	9	221	18	0.1	0.09	0.152	0.005	1244	62	-651.1	0.655	0.64	0.34	0.6	66	10	299.2	3	0	0	85	1008	7
6	8	9	221	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	299.1	3	0	0	88	1008	7
6	8	9	221	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	299.1	3	0	0	91	1009	7
6	8	9	221	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	298.9	3	0	0	94	1010	7
6	8	9	221	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	298.9	3	0	0	94	1010	7
6	8	9	221	23	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	74	10	298.8	3	0	0	94	1010	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	9	221	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	298.4	3	0	0	94	1010	3
6	8	10	222	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	298.4	3	0	0	88	1010	3
6	8	10	222	2	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	298.4	3	0	0	97	1009	7
6	8	10	222	3	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	71	10	298.2	3	0	0	94	1009	7
6	8	10	222	4	-3.3	0.069	-9	-9	-999	42	9	0.736	0.77	1	0.9	142	10	298.1	3	0	0	100	1009	3
6	8	10	222	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	129	10	297.9	3	0	0	97	1010	7
6	8	10	222	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	81	10	297.4	3	0	0.25	94	1010	7
6	8	10	222	7	-1.1	0.049	-9	-9	-999	25	9	0.37	0.38	0.47	0.8	112	10	298.4	3	0	0	94	1011	0
6	8	10	222	8	77.8	0.278	0.925	0.005	367	338	-25	0.736	0.77	0.24	1.4	144	10	302.4	3	0	0	88	1011	0
6	8	10	222	9	46.2	0.283	0.829	0.005	446	346	-44.2	0.37	0.38	0.2	2	138	10	302.1	3	0	0	83	1011	9
6	8	10	222	10	63.3	0.236	1.114	0.005	789	264	-18.7	0.37	0.38	0.19	1.5	118	10	302.4	3	0	0	79	1012	9
6	8	10	222	11	103.1	0.303	1.361	0.005	882	383	-24.3	0.37	0.38	0.18	2	130	10	304	3	0	0	80	1011	8
6	8	10	222	12	97	0.353	1.376	0.005	968	482	-40.9	0.736	0.77	0.17	1.9	141	10	304.1	3	0	0.25	70	1010	10
6	8	10	222	13	94.3	0.268	1.413	0.005	1079	322	-18.4	0.37	0.38	0.18	1.7	109	10	303.6	3	0	0	79	1009	9
6	8	10	222	14	108.3	0.337	1.581	0.006	1315	450	-31.8	0.37	0.38	0.18	2.3	112	10	304.2	3	0	0	77	1009	8
6	8	10	222	15	79.5	0.372	1.469	0.008	1434	521	-58	0.37	0.38	0.19	2.7	126	10	305	3	0	0	66	1008	8
6	8	10	222	16	32.5	0.308	1.092	0.008	1443	395	-81	0.37	0.38	0.19	2.3	123	10	304	3	0	0	70	1008	10
6	8	10	222	17	12.9	0.25	0.804	0.008	1447	288	-108.3	0.37	0.38	0.22	1.9	123	10	303.2	3	0	0	77	1009	10
6	8	10	222	18	0.1	0.134	0.159	0.008	1445	119	-2173.2	0.37	0.38	0.35	1.1	118	10	301.4	3	0	0	80	1009	7
6	8	10	222	19	-1.2	0.042	-9	-9	-999	28	5.6	0.37	0.38	1	0.7	108	10	300.5	3	0	0	82	1009	7
6	8	10	222	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	300	3	0	0	85	1010	7
6	8	10	222	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	299.4	3	0	0	88	1010	3
6	8	10	222	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	299.4	3	0	0	88	1011	3
6	8	10	222	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	99	10	299.5	3	0	0	88	1011	0
6	8	10	222	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	111	10	298.9	3	0	0	88	1011	3
6	8	11	223	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	104	10	298.6	3	0	0	88	1010	3
6	8	11	223	2	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	107	10	298.5	3	0	0	91	1010	3
6	8	11	223	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	100	10	298.2	3	0	0	88	1010	3
6	8	11	223	4	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	95	10	298.1	3	0	0	94	1010	3
6	8	11	223	5	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	93	10	298	3	0	0	91	1010	3
6	8	11	223	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	299.4	3	0	0	88	1010	3
6	8	11	223	7	-1.6	0.061	-9	-9	-999	34	12.6	0.37	0.38	0.47	1	105	10	302.4	3	0	0	88	1011	0
6	8	11	223	8	51	0.241	0.641	0.005	186	273	-24.9	0.37	0.38	0.25	1.6	110	10	303	3	0	0	80	1012	0
6	8	11	223	9	78.8	0.241	0.912	0.005	347	272	-16	0.37	0.38	0.2	1.5	114	10	304.2	3	0	0	70	1012	6
6	8	11	223	10	111.8	0.295	1.289	0.005	692	368	-20.6	0.37	0.38	0.19	1.9	120	10	305.1	3	0	0	80	1012	5
6	8	11	223	11	101.5	0.247	1.325	0.005	828	284	-13.4	0.37	0.38	0.18	1.5	120	10	306	3	0	0	72	1012	8
6	8	11	223	12	121.9	0.297	1.533	0.005	1067	372	-19.4	0.37	0.38	0.18	1.9	121	10	306.6	3	0	0	60	1010	7
6	8	11	223	13	115.8	0.296	1.592	0.006	1256	370	-20.1	0.37	0.38	0.18	1.9	123	10	306.9	3	0	0	66	1009	8
6	8	11	223	14	102.9	0.303	1.564	0.006	1340	383	-24.3	0.37	0.38	0.18	2	113	10	306.2	3	0	0	61	1009	8
6	8	11	223	15	60.8	0.256	1.32	0.006	1363	299	-25	0.37	0.38	0.19	1.7	102	10	305	3	0	0	65	1009	9
6	8	11	223	16	60.9	0.301	1.329	0.006	1386	380	-40.3	0.655	0.64	0.19	1.7	75	10	304	3	0	0	79	1009	9
6	8	11	223	17	15.3	0.23	0.84	0.006	1391	255	-71.5	0.37	0.38	0.22	1.7	87	10	303.2	3	0	0	65	1009	10
6	8	11	223	18	0.1	0.206	0.157	0.006	1389	215	-7847.2	0.655	0.64	0.34	1.4	83	10	301.2	3	0	0	75	1009	3
6	8	11	223	19	-6.4	0.095	-9	-9	-999	74	12.2	0.655	0.64	1	1.3	80	10	300.2	3	0	0	82	1010	3
6	8	11	223	20	-6.4	0.095	-9	-9	-999	68	12.2	0.655	0.64	1	1.3	81	10	299.5	3	0	0	88	1011	3
6	8	11	223	21	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	93	10	299.1	3	0	0	82	1012	3
6	8	11	223	22	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	81	10	298.8	3	0	0	88	1012	3
6	8	11	223	23	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	85	10	298.5	3	0	0	85	1012	0
6	8	11	223	24	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	82	10	298.4	3	0	0	82	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	12	224	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	92	10	298.4	3	0	0	94	1010	3
6	8	12	224	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	298.4	3	0	0	94	1010	7
6	8	12	224	3	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	98	10	298.4	3	0	0	94	1010	7
6	8	12	224	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	107	10	298.4	3	0	0	94	1010	7
6	8	12	224	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	298.4	3	0	0	97	1010	7
6	8	12	224	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	299.9	3	0	0	94	1011	7
6	8	12	224	7	-2.1	0.073	-9	-9	-999	46	17	0.655	0.64	0.46	1	69	10	302.4	3	0	0	100	1012	0
6	8	12	224	8	56.7	0.26	0.682	0.005	202	306	-28.1	0.655	0.64	0.24	1.4	68	10	302.5	3	0	0	94	1012	7
6	8	12	224	9	45.7	0.173	0.696	0.005	266	168	-10.2	0.37	0.38	0.2	1	95	10	301	3	0	0.51	94	1013	9
6	8	12	224	10	45.5	0.195	0.784	0.005	382	198	-14.7	0.37	0.38	0.19	1.2	92	10	301.4	3	0	0	85	1013	10
6	8	12	224	11	129.4	0.363	1.368	0.005	715	503	-33.3	0.655	0.64	0.18	2	84	10	302.6	3	0	0	85	1012	8
6	8	12	224	12	51.9	0.22	1.062	0.005	835	249	-18.6	0.37	0.38	0.18	1.4	90	10	301.2	3	0	0	82	1012	10
6	8	12	224	13	114.6	0.216	1.455	0.005	970	231	-8	0.37	0.38	0.18	1.2	108	10	304.2	3	0	0	79	1011	8
6	8	12	224	14	94.8	0.223	1.416	0.005	1081	243	-10.6	0.37	0.38	0.18	1.3	88	10	304.9	3	0	0	70	1010	8
6	8	12	224	15	31.4	0.21	0.991	0.005	1115	221	-26.4	0.37	0.38	0.19	1.4	124	10	303.9	3	0	0	70	1009	10
6	8	12	224	16	18.2	0.222	0.831	0.005	1133	240	-54	0.37	0.38	0.19	1.6	95	10	302.5	3	0	0	75	1009	10
6	8	12	224	17	5	0.206	0.542	0.005	1136	215	-156.8	0.37	0.38	0.22	1.6	87	10	301.4	3	0	0	75	1009	10
6	8	12	224	18	0.1	0.162	0.147	0.005	1133	150	-3828.2	0.655	0.64	0.34	1.1	84	10	300.2	3	0	0	74	1010	7
6	8	12	224	19	-4.1	0.081	-9	-9	-999	55	11.6	0.655	0.64	1	1.1	83	10	299.4	3	0	0	82	1010	7
6	8	12	224	20	-4.7	0.081	-9	-9	-999	53	10.1	0.655	0.64	1	1.1	72	10	299	3	0	0	85	1010	0
6	8	12	224	21	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	80	10	298.6	3	0	0	88	1012	3
6	8	12	224	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	93	10	298.4	3	0	0	88	1012	3
6	8	12	224	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	298.2	3	0	0	91	1012	7
6	8	12	224	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	298	3	0	0	88	1011	7
6	8	13	225	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	104	10	297.9	3	0	0	88	1010	7
6	8	13	225	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	128	10	297.8	3	0	0	90	1010	7
6	8	13	225	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	297.8	3	0	0	94	1010	7
6	8	13	225	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	93	10	297.8	3	0	0	94	1010	7
6	8	13	225	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	82	10	297.1	3	0	0	94	1011	7
6	8	13	225	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	92	10	297.8	3	0	0	100	1011	7
6	8	13	225	7	-1.4	0.059	-9	-9	-999	33	12.6	0.655	0.64	0.46	0.8	78	10	300.1	3	0	0	94	1011	0
6	8	13	225	8	53.1	0.152	0.798	0.005	346	137	-6	0.37	0.38	0.25	0.8	90	10	302.5	3	0	0	82	1012	0
6	8	13	225	9	92.7	0.166	1.201	0.005	675	155	-4.4	0.736	0.77	0.19	0.6	184	10	303.9	3	0	0	75	1012	8
6	8	13	225	10	47.5	0.149	1.038	0.006	851	133	-6.3	0.265	0.28	0.14	0.9	331	10	303.6	3	0	0	80	1012	9
6	8	13	225	11	55.3	0.285	1.118	0.007	911	351	-37.9	0.655	0.64	0.18	1.6	347	10	302.4	3	0	0	72	1012	10
6	8	13	225	12	52.1	0.284	1.107	0.007	939	348	-39.6	0.655	0.64	0.18	1.6	346	10	303	3	0	0	60	1011	10
6	8	13	225	13	68.7	0.304	1.23	0.007	976	386	-36.9	0.655	0.64	0.18	1.7	343	10	303.6	3	0	0	56	1010	10
6	8	13	225	14	99.8	0.329	1.418	0.007	1030	433	-32	0.655	0.64	0.18	1.8	345	10	304.4	3	0	0	54	1009	9
6	8	13	225	15	83.2	0.297	1.354	0.007	1074	373	-28.4	0.655	0.64	0.18	1.6	350	10	304	3	0	0	70	1008	9
6	8	13	225	16	35.2	0.223	1.022	0.007	1092	244	-28.3	0.655	0.64	0.19	1.2	23	10	302.6	3	0	0.25	94	1009	10
6	8	13	225	17	0.1	0.182	0.145	0.007	1088	179	-5459	0.37	0.38	0.22	1.5	120	10	299	3	0	0.25	91	1009	10
6	8	13	225	18	0.1	0.134	0.145	0.007	1088	113	-2173.2	0.37	0.38	0.35	1.1	106	10	298.9	3	0	0	88	1009	3
6	8	13	225	19	-2.3	0.055	-9	-9	-999	32	6.3	0.37	0.38	1	0.9	94	10	299.1	3	0	0	88	1009	3
6	8	13	225	20	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	82	10	298.9	3	0	0	91	1010	3
6	8	13	225	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	298.6	3	0	0	88	1011	3
6	8	13	225	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	298.4	3	0	0	94	1012	3
6	8	13	225	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	91	10	298.2	3	0	0	97	1011	0
6	8	13	225	24	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	298.1	3	0	0	94	1011	7
6	8	14	226	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	108	10	298	3	0	0	100	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	14	226	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	89	10	298.1	3	0	0	100	1010	0
6	8	14	226	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	298	3	0	0	100	1010	3
6	8	14	226	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	297.9	3	0	0	100	1010	3
6	8	14	226	5	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	125	10	297.8	3	0	0	97	1010	0
6	8	14	226	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	103	10	299.2	3	0	0	100	1010	3
6	8	14	226	7	-1.6	0.061	-9	-9	-999	34	12.4	0.37	0.38	0.47	1	125	10	302.1	3	0	0	94	1012	0
6	8	14	226	8	73.3	0.261	1.316	0.008	1124	307	-22	0.37	0.38	0.25	1.7	132	10	303.8	3	0	0	82	1012	0
6	8	14	226	9	139.6	0.338	1.66	0.008	1185	452	-25	0.736	0.77	0.19	1.7	140	10	304.5	3	0	0	80	1012	0
6	8	14	226	10	114.6	0.262	1.576	0.008	1234	310	-14.1	0.37	0.38	0.19	1.6	125	10	305.9	3	0	0	70	1012	5
6	8	14	226	11	174.8	0.29	1.851	0.007	1311	359	-12.6	0.736	0.77	0.17	1.3	144	10	306.6	3	0	0	68	1012	7
6	8	14	226	12	100.5	0.258	1.556	0.007	1354	302	-15.4	0.37	0.38	0.18	1.6	138	10	306.5	3	0	0	54	1011	8
6	8	14	226	13	90.6	0.267	1.518	0.007	1394	317	-18.9	0.37	0.38	0.18	1.7	131	10	306.8	3	0	0	56	1010	9
6	8	14	226	14	50.2	0.241	1.254	0.007	1415	272	-25.1	0.37	0.38	0.18	1.6	113	10	306.2	3	0	0	54	1010	10
6	8	14	226	15	57.4	0.221	1.319	0.007	1440	239	-17	0.655	0.64	0.18	1.1	76	10	305.9	3	0	0	58	1009	10
6	8	14	226	16	52.9	0.206	1.29	0.006	1462	215	-14.8	0.655	0.64	0.19	1	82	10	305.4	3	0	0	54	1009	10
6	8	14	226	17	3.3	0.192	0.514	0.006	1461	193	-189.2	0.37	0.38	0.22	1.5	113	10	303.2	3	0	0	61	1009	10
6	8	14	226	18	0.1	0.146	0.16	0.006	1459	129	-2812.4	0.37	0.38	0.35	1.2	113	10	301.8	3	0	0	70	1009	3
6	8	14	226	19	-2.3	0.055	-9	-9	-999	34	6.3	0.37	0.38	1	0.9	106	10	300.6	3	0	0	79	1010	3
6	8	14	226	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	104	10	299.9	3	0	0	79	1010	3
6	8	14	226	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	299.8	3	0	0	82	1011	3
6	8	14	226	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	99	10	299.4	3	0	0	88	1012	3
6	8	14	226	23	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	299.4	3	0	0	88	1011	3
6	8	14	226	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	114	10	299.4	3	0	0	88	1011	3
6	8	15	227	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	97	10	298.9	3	0	0	88	1010	3
6	8	15	227	2	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	87	10	298.4	3	0	0	94	1010	3
6	8	15	227	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	99	10	298.1	3	0	0	94	1009	3
6	8	15	227	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	298	3	0	0	94	1009	3
6	8	15	227	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	297.9	3	0	0	94	1009	3
6	8	15	227	6	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	81	10	299.2	3	0	0	94	1010	3
6	8	15	227	7	-1.7	0.061	-9	-9	-999	34	12.1	0.37	0.38	0.47	1	102	10	301.2	3	0	0	82	1011	0
6	8	15	227	8	52.2	0.198	0.763	0.005	307	203	-13.4	0.37	0.38	0.25	1.2	108	10	302.9	3	0	0	77	1012	0
6	8	15	227	9	73.9	0.194	1.023	0.005	523	197	-8.9	0.37	0.38	0.2	1.1	110	10	304	3	0	0	75	1012	7
6	8	15	227	10	121.7	0.241	1.402	0.005	819	273	-10.4	0.37	0.38	0.19	1.4	104	10	305.6	3	0	0	80	1012	0
6	8	15	227	11	78.1	0.251	1.245	0.005	893	289	-18.3	0.736	0.77	0.17	1.2	188	10	303	3	0	0.76	70	1012	10
6	8	15	227	12	11.7	-9	-9	-9	902	-999	-99999	0.542	0.56	0.16	0	0	10	300.2	3	0	6.86	62	1011	10
6	8	15	227	13	4.5	0.177	0.482	0.005	905	171	-111.8	0.655	0.64	0.18	1.1	24	10	298.4	3	0	8.38	75	1011	10
6	8	15	227	14	11.7	0.163	0.668	0.005	916	152	-33.4	0.655	0.64	0.18	0.9	84	10	298.4	3	0	1.52	77	1010	10
6	8	15	227	15	32.2	0.168	0.947	0.005	950	158	-13.2	0.655	0.64	0.18	0.8	66	10	299.9	3	0	0	88	1009	10
6	8	15	227	16	28.8	0.179	0.922	0.005	979	174	-17.9	0.655	0.64	0.19	0.9	84	10	300.8	3	0	0	88	1009	10
6	8	15	227	17	8.5	0.159	0.616	0.005	987	145	-42.2	0.655	0.64	0.22	0.9	70	10	300.5	3	0	0	85	1009	10
6	8	15	227	18	0.1	0.122	0.14	0.005	986	98	-1640.9	0.37	0.38	0.36	1	88	10	299.6	3	0	0	86	1009	7
6	8	15	227	19	-1.7	0.051	-9	-9	-999	28	7.4	0.655	0.64	1	0.7	80	10	299.1	3	0	0	88	1010	7
6	8	15	227	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	298.9	3	0	0	91	1010	7
6	8	15	227	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	87	10	298.6	3	0	0	88	1010	3
6	8	15	227	22	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	97	10	298.6	3	0	0	94	1011	3
6	8	15	227	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	99	10	298.4	3	0	0	94	1011	3
6	8	15	227	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	298.4	3	0	0	88	1010	3
6	8	16	228	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	298.1	3	0	0	94	1009	7
6	8	16	228	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	67	10	297.9	3	0	0	94	1009	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	16	228	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	297.9	3	0	0	94	1009	3
6	8	16	228	4	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	70	10	297.9	3	0	0	94	1009	3
6	8	16	228	5	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	81	10	297.9	3	0	0	91	1009	7
6	8	16	228	6	-5	0.085	-9	-9	-999	57	11.1	0.37	0.38	1	1.4	110	10	298	3	0	0	94	1010	7
6	8	16	228	7	-1.8	0.061	-9	-9	-999	34	11.4	0.37	0.38	0.47	1	116	10	299.4	3	0	0	94	1010	0
6	8	16	228	8	58.8	0.201	0.721	0.006	230	207	-12.4	0.37	0.38	0.25	1.2	137	10	302.2	3	0	0	91	1011	0
6	8	16	228	9	60.2	0.267	0.818	0.005	327	317	-28.5	0.37	0.38	0.2	1.8	106	10	303.4	3	0	0	80	1012	8
6	8	16	228	10	131.5	0.281	1.252	0.005	539	342	-15.2	0.736	0.77	0.18	1.3	151	10	302.6	3	0	0	70	1012	8
6	8	16	228	11	83.3	0.351	1.194	0.005	737	479	-47	0.37	0.38	0.18	2.5	137	10	301.4	3	0	0	66	1011	9
6	8	16	228	12	84.4	0.265	1.255	0.005	845	317	-19.9	0.37	0.38	0.18	1.7	102	10	300.9	3	0	0.51	79	1010	9
6	8	16	228	13	117.9	0.285	1.459	0.005	949	350	-17.7	0.37	0.38	0.18	1.8	94	10	303	3	0	0	94	1009	7
6	8	16	228	14	114.3	0.295	1.493	0.005	1049	369	-20.3	0.37	0.38	0.18	1.9	98	10	303.8	3	0	0	97	1009	7
6	8	16	228	15	27.6	0.218	0.935	0.005	1066	236	-33.8	0.37	0.38	0.19	1.5	108	10	300.4	3	0	9.91	88	1008	10
6	8	16	228	16	6.1	0.194	0.567	0.005	1068	196	-106.5	0.655	0.64	0.19	1.2	63	10	298.4	3	0	0.25	94	1009	10
6	8	16	228	17	0.5	0.178	0.24	0.005	1068	173	-1101.4	0.655	0.64	0.22	1.2	68	10	298.2	3	0	0	100	1009	10
6	8	16	228	18	0.1	0.182	0.144	0.005	1067	179	-5460.8	0.37	0.38	0.36	1.5	86	10	298.1	3	0	0	88	1009	7
6	8	16	228	19	-6.6	0.103	-9	-9	-999	77	14.7	0.655	0.64	1	1.4	78	10	297.9	3	0	0	94	1010	7
6	8	16	228	20	-5.7	0.095	-9	-9	-999	68	13.7	0.655	0.64	1	1.3	82	10	297.5	3	0	0	100	1010	7
6	8	16	228	21	-6.5	0.097	-9	-9	-999	70	12.6	0.37	0.38	1	1.6	91	10	297.6	3	0	0	94	1012	7
6	8	16	228	22	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	113	10	297.6	3	0	0	94	1011	7
6	8	16	228	23	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	297.6	3	0	0	97	1011	7
6	8	16	228	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	297.8	3	0	0	100	1011	7
6	8	17	229	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	106	10	297.9	3	0	0	94	1010	7
6	8	17	229	2	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	119	10	298	3	0	0	97	1010	7
6	8	17	229	3	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	134	10	297.9	3	0	0	94	1009	7
6	8	17	229	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	43	10	297.4	3	0	0	100	1009	7
6	8	17	229	5	-2.2	0.066	-9	-9	-999	39	11.6	0.655	0.64	1	0.9	55	10	297	3	0	0	94	1010	10
6	8	17	229	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	86	10	296.4	3	0	0.76	100	1011	7
6	8	17	229	7	-4.1	0.216	-9	-9	-999	230	217.8	0.37	0.38	0.47	1.9	106	10	295.9	3	0	5.08	100	1012	10
6	8	17	229	8	17.5	0.156	0.448	0.006	186	143	-19.8	0.655	0.64	0.24	0.8	73	10	295.9	3	0	0	100	1012	10
6	8	17	229	9	58.9	0.208	0.847	0.007	372	219	-13.8	0.655	0.64	0.19	1	74	10	297.9	3	0	0	97	1012	9
6	8	17	229	10	67.7	0.145	0.967	0.007	482	127	-4	0.37	0.38	0.19	0.7	94	10	300.8	3	0	0	94	1012	9
6	8	17	229	11	77.5	0.147	1.065	0.007	563	129	-3.7	0.37	0.38	0.18	0.7	126	10	302.6	3	0	0	77	1011	9
6	8	17	229	12	95.6	-9	-9	-9	663	-999	-99999	0.542	0.56	0.16	0	0	10	303.5	3	0	0	79	1010	9
6	8	17	229	13	46.3	0.15	0.971	0.005	711	134	-6.6	0.37	0.38	0.18	0.8	97	10	303	3	0	0	75	1009	10
6	8	17	229	14	57.6	0.288	1.073	0.005	771	356	-37.3	0.37	0.38	0.18	2	113	10	303.2	3	0	0	63	1009	9
6	8	17	229	15	31	0.231	0.88	0.005	792	257	-36	0.37	0.38	0.19	1.6	117	10	302.8	3	0	0	65	1009	10
6	8	17	229	16	6.6	0.165	0.526	0.005	795	154	-60.8	0.37	0.38	0.19	1.2	118	10	301.5	3	0	0	70	1009	10
6	8	17	229	17	1.1	0.128	0.292	0.005	795	106	-168.8	0.37	0.38	0.23	1	118	10	300.6	3	0	0	72	1009	10
6	8	17	229	18	0.1	0.098	0.13	0.005	793	71	-855.8	0.37	0.38	0.36	0.8	117	10	299.2	3	0	0	88	1009	7
6	8	17	229	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	298.9	3	0	0	88	1010	7
6	8	17	229	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	298.6	3	0	0	88	1010	7
6	8	17	229	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	298.5	3	0	0	88	1011	7
6	8	17	229	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	298.4	3	0	0	88	1011	7
6	8	17	229	23	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	88	10	298.4	3	0	0	94	1011	7
6	8	17	229	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	71	10	298.2	3	0	0	94	1011	7
6	8	18	230	1	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	93	10	298.4	3	0	0	94	1010	7
6	8	18	230	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	298.1	3	0	0	94	1009	7
6	8	18	230	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	297.9	3	0	0	94	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	18	230	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	297.5	3	0	0	100	1010	7
6	8	18	230	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	100	10	297.4	3	0	0	97	1010	7
6	8	18	230	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	101	10	297.8	3	0	0	94	1010	7
6	8	18	230	7	-0.2	0.093	-9	-9	-999	66	394.3	0.37	0.38	0.47	0.8	100	10	299	3	0	0	94	1011	4
6	8	18	230	8	44.8	0.184	0.594	0.005	169	181	-12.5	0.37	0.38	0.25	1.1	110	10	301.6	3	0	0	91	1012	0
6	8	18	230	9	72.5	0.272	0.86	0.005	316	325	-24.9	0.37	0.38	0.2	1.8	122	10	303.5	3	0	0	85	1012	7
6	8	18	230	10	31.4	0.232	0.693	0.005	381	257	-35.7	0.37	0.38	0.19	1.6	132	10	300.8	3	0	0.51	75	1012	10
6	8	18	230	11	66.7	0.28	1.025	0.005	583	341	-29.8	0.37	0.38	0.18	1.9	134	10	300.9	3	0	0	94	1012	9
6	8	18	230	12	58.4	0.288	1.073	0.005	762	356	-37	0.37	0.38	0.18	2	137	10	301.8	3	0	0	82	1011	10
6	8	18	230	13	35.5	0.299	0.935	0.006	829	376	-67.8	0.37	0.38	0.18	2.2	134	10	301	3	0	0	79	1010	10
6	8	18	230	14	48.4	0.307	1.053	0.006	868	390	-53.6	0.736	0.77	0.17	1.7	157	10	300.5	3	0	0	79	1009	10
6	8	18	230	15	29	0.208	0.896	0.006	892	222	-28	0.37	0.38	0.19	1.4	137	10	300.9	3	0	0	74	1009	10
6	8	18	230	16	23.8	0.205	0.845	0.006	912	213	-32.4	0.37	0.38	0.19	1.4	118	10	300.9	3	0	0	74	1009	10
6	8	18	230	17	7	0.154	0.562	0.006	917	140	-47.6	0.37	0.38	0.23	1.1	109	10	300.2	3	0	0	79	1009	10
6	8	18	230	18	0.1	0.11	0.137	0.006	915	84	-1205.3	0.37	0.38	0.36	0.9	111	10	299.2	3	0	0	82	1009	7
6	8	18	230	19	-2.1	0.055	-9	-9	-999	30	7.1	0.37	0.38	1	0.9	91	10	298.8	3	0	0	88	1010	7
6	8	18	230	20	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	91	10	298.5	3	0	0	91	1011	7
6	8	18	230	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	106	10	298.1	3	0	0	88	1011	7
6	8	18	230	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	82	1012	7
6	8	18	230	23	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	82	10	298	3	0	0	88	1011	7
6	8	18	230	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	91	10	297.9	3	0	0	100	1011	7
6	8	19	231	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	80	10	297.5	3	0	0	94	1010	7
6	8	19	231	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	118	10	297.4	3	0	0	97	1010	0
6	8	19	231	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	132	10	297.2	3	0	0	100	1010	7
6	8	19	231	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	139	10	297.2	3	0	0	100	1010	7
6	8	19	231	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	128	10	297.4	3	0	0	100	1011	7
6	8	19	231	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	297.6	3	0	0	94	1012	7
6	8	19	231	7	-1.1	0.049	-9	-9	-999	25	9.2	0.37	0.38	0.47	0.8	127	10	299.4	3	0	0	94	1012	0
6	8	19	231	8	52	0.187	0.718	0.005	257	186	-11.3	0.37	0.38	0.25	1.1	107	10	302.4	3	0	0	85	1013	0
6	8	19	231	9	74.9	0.206	0.948	0.005	411	215	-10.6	0.37	0.38	0.2	1.2	118	10	303.6	3	0	0	80	1013	6
6	8	19	231	10	146.3	-9	-9	-9	714	-999	-99999	0.542	0.56	0.17	0	0	10	305.6	3	0	0	70	1013	6
6	8	19	231	11	53.7	-9	-9	-9	813	-999	-99999	0.542	0.56	0.17	0	0	10	303.6	3	0	0	68	1012	10
6	8	19	231	12	75.8	0.242	1.234	0.005	894	273	-16.8	0.655	0.64	0.18	1.2	2	10	303.2	3	0	0	62	1011	10
6	8	19	231	13	58.7	0.274	1.158	0.005	955	330	-31.7	0.655	0.64	0.18	1.5	358	10	301.9	3	0	0	66	1011	10
6	8	19	231	14	7	0.104	0.578	0.005	988	103	-14.2	0.655	0.64	0.18	0.5	23	10	300	3	0	15.75	70	1010	10
6	8	19	231	15	17.3	0.129	0.784	0.005	1006	107	-11.3	0.655	0.64	0.18	0.6	25	10	298.9	3	0	8.38	61	1010	10
6	8	19	231	16	15.8	0.155	0.767	0.005	1027	140	-21.1	0.655	0.64	0.19	0.8	77	10	299.9	3	0	0	75	1009	10
6	8	19	231	17	0.7	0.092	0.271	0.005	1027	65	-102.3	0.37	0.38	0.23	0.7	101	10	299.4	3	0	0	77	1010	10
6	8	19	231	18	0.1	0.087	0.142	0.005	1025	59	-583.6	0.37	0.38	0.36	0.7	118	10	298.9	3	0	0	79	1010	7
6	8	19	231	19	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	100	10	298.5	3	0	0	82	1011	7
6	8	19	231	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	298.4	3	0	0	88	1012	3
6	8	19	231	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	65	10	298.1	3	0	0	88	1012	3
6	8	19	231	22	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	80	10	298	3	0	0	94	1012	0
6	8	19	231	23	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	72	10	297.8	3	0	0	97	1012	3
6	8	19	231	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	55	10	297.5	3	0	0	94	1012	3
6	8	20	232	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	55	10	297.2	3	0	0	94	1011	3
6	8	20	232	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	297.4	3	0	0	94	1011	3
6	8	20	232	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.4	3	0	0	100	1011	3
6	8	20	232	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	297.2	3	0	0	94	1011	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	20	232	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.1	3	0	0	97	1011	3
6	8	20	232	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	298.4	3	0	0	94	1012	3
6	8	20	232	7	-1.8	0.066	-9	-9	-999	39	14.8	0.655	0.64	0.46	0.9	81	10	301.4	3	0	0	94	1012	0
6	8	20	232	8	60.4	0.201	1.046	0.005	684	208	-12.2	0.37	0.38	0.25	1.2	108	10	303.2	3	0	0	85	1013	0
6	8	20	232	9	72.5	0.216	1.199	0.006	861	232	-12.6	0.37	0.38	0.2	1.3	108	10	303.4	3	0	0.51	80	1014	7
6	8	20	232	10	104.3	0.226	1.386	0.006	923	247	-10	0.37	0.38	0.19	1.3	105	10	304.9	3	0	0	75	1013	7
6	8	20	232	11	125.2	0.287	1.512	0.006	998	353	-17	0.37	0.38	0.18	1.8	102	10	305.8	3	0	0	66	1013	7
6	8	20	232	12	139.3	0.29	1.609	0.006	1081	359	-15.7	0.37	0.38	0.18	1.8	117	10	306.2	3	0	0	58	1012	6
6	8	20	232	13	124.3	0.275	1.585	0.007	1156	332	-15.1	0.37	0.38	0.18	1.7	110	10	306.4	3	0	0	58	1011	7
6	8	20	232	14	99.2	0.258	1.495	0.007	1215	301	-15.6	0.37	0.38	0.18	1.6	103	10	306.4	3	0	0	51	1010	8
6	8	20	232	15	81.2	0.253	1.417	0.007	1263	293	-18	0.37	0.38	0.19	1.6	96	10	306	3	0	0	54	1010	8
6	8	20	232	16	50.4	0.263	1.217	0.006	1291	310	-32.5	0.37	0.38	0.19	1.8	92	10	305.4	3	0	0	62	1010	9
6	8	20	232	17	15.4	0.241	0.822	0.006	1297	272	-81.8	0.37	0.38	0.23	1.8	91	10	303.6	3	0	0	59	1011	10
6	8	20	232	18	0.1	0.134	0.153	0.006	1294	118	-2177.5	0.37	0.38	0.36	1.1	96	10	301.5	3	0	0	75	1011	7
6	8	20	232	19	-2.5	0.061	-9	-9	-999	36	7.9	0.37	0.38	1	1	89	10	300.5	3	0	0	79	1012	7
6	8	20	232	20	-3.9	0.073	-9	-9	-999	46	9.2	0.655	0.64	1	1	82	10	299.8	3	0	0	82	1012	0
6	8	20	232	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	89	10	299.4	3	0	0	77	1013	7
6	8	20	232	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	83	10	299	3	0	0	77	1013	7
6	8	20	232	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	82	10	298.9	3	0	0	91	1013	7
6	8	20	232	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	298.4	3	0	0	94	1012	7
6	8	21	233	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	89	10	298.5	3	0	0	94	1012	7
6	8	21	233	2	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	298.5	3	0	0	94	1011	7
6	8	21	233	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	102	10	298.4	3	0	0	94	1011	7
6	8	21	233	4	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	93	10	298.1	3	0	1.52	94	1012	7
6	8	21	233	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	112	10	297.6	3	0	0	97	1012	7
6	8	21	233	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	298.4	3	0	0	94	1012	7
6	8	21	233	7	-1.1	0.049	-9	-9	-999	25	9.3	0.37	0.38	0.47	0.8	134	10	299.8	3	0	0	100	1013	0
6	8	21	233	8	41.8	0.235	0.97	0.006	789	262	-28.1	0.736	0.77	0.24	1.2	168	10	300	3	0	0.25	82	1014	9
6	8	21	233	9	134.8	0.191	1.469	0.005	853	192	-4.7	0.736	0.77	0.19	0.7	146	10	303.1	3	0	0	70	1014	0
6	8	21	233	10	95	0.2	1.326	0.005	888	206	-7.6	0.37	0.38	0.19	1.1	104	10	303.5	3	0	4.06	66	1014	7
6	8	21	233	11	87.3	0.232	1.305	0.005	921	257	-13	0.37	0.38	0.18	1.4	86	10	305	3	0	0	62	1014	9
6	8	21	233	12	119.3	0.263	1.49	0.005	1003	310	-13.7	0.37	0.38	0.18	1.6	97	10	306.4	3	0	0	62	1013	7
6	8	21	233	13	148	0.247	1.678	0.005	1153	282	-9.2	0.655	0.64	0.18	1.1	83	10	306.2	3	0	0	58	1011	8
6	8	21	233	14	85	0.323	1.427	0.005	1234	423	-35.9	0.655	0.64	0.18	1.8	338	10	303.8	3	0	0	52	1010	9
6	8	21	233	15	50.4	0.231	1.215	0.005	1283	259	-22	0.655	0.64	0.18	1.2	333	10	303.4	3	0	0	56	1010	10
6	8	21	233	16	6.5	0.116	0.615	0.005	1288	97	-21.6	0.655	0.64	0.19	0.6	64	10	302.5	3	0	0	58	1010	10
6	8	21	233	17	0.1	0.122	0.153	0.005	1286	98	-1642.5	0.37	0.38	0.23	1	96	10	301.9	3	0	0	63	1010	10
6	8	21	233	18	0.1	0.063	0.153	0.005	1284	37	-229.1	0.37	0.38	0.37	0.5	116	10	301.2	3	0	0	75	1011	7
6	8	21	233	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	80	10	300.8	3	0	0	74	1012	7
6	8	21	233	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	73	10	300	3	0	0	88	1012	7
6	8	21	233	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	299.8	3	0	0	88	1013	7
6	8	21	233	22	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	84	10	299.4	3	0	0	94	1013	7
6	8	21	233	23	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	86	10	299.4	3	0	0	88	1013	7
6	8	21	233	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	92	10	299.2	3	0	0	82	1013	3
6	8	22	234	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	298.9	3	0	0	94	1012	7
6	8	22	234	2	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	79	10	298.5	3	0	0	94	1012	7
6	8	22	234	3	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	97	10	298.5	3	0	0	94	1011	7
6	8	22	234	4	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	87	10	298.5	3	0	0.76	94	1011	7
6	8	22	234	5	-3.5	0.079	-9	-9	-999	51	12.6	0.37	0.38	1	1.3	87	10	298.1	3	0	2.79	97	1012	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	22	234	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	128	10	298.1	3	0	0	94	1012	7
6	8	22	234	7	2.3	0.092	0.116	0.006	25	64	-30.7	0.655	0.64	0.46	0.5	73	10	298.9	3	0	0	94	1013	6
6	8	22	234	8	22.5	0.149	0.445	0.006	141	132	-13.2	0.37	0.38	0.25	0.9	115	10	299.9	3	0	0	91	1013	9
6	8	22	234	9	34.6	0.144	0.572	0.006	195	126	-7.9	0.37	0.38	0.2	0.8	107	10	300.9	3	0	0	88	1013	9
6	8	22	234	10	41.9	0.148	0.672	0.006	261	131	-7	0.37	0.38	0.19	0.8	100	10	301.9	3	0	0	85	1013	10
6	8	22	234	11	35.8	0.121	0.681	0.006	317	97	-4.5	0.37	0.38	0.18	0.6	87	10	302.1	3	0	0	77	1013	10
6	8	22	234	12	51.5	-9	-9	-9	399	-999	-99999	0.542	0.56	0.16	0	0	10	302.6	3	0	0	80	1012	10
6	8	22	234	13	74.4	0.133	1.023	0.005	519	112	-2.9	0.37	0.38	0.18	0.6	89	10	304.1	3	0	0	75	1011	9
6	8	22	234	14	62	0.188	1.019	0.005	615	187	-9.7	0.736	0.77	0.17	0.8	167	10	303	3	0	0	68	1010	10
6	8	22	234	15	34.3	0.512	0.862	0.005	672	843	-353	0.37	0.38	0.19	4.1	125	10	304.2	2	0	-9	66	1010	10
6	8	22	234	16	15.4	0.176	0.667	0.005	692	320	-31.7	0.37	0.38	0.19	1.2	118	10	301.9	3	0	0	80	1010	10
6	8	22	234	17	1.3	0.118	0.293	0.005	692	109	-113.6	0.37	0.38	0.23	0.9	117	10	301.1	3	0	0	82	1010	10
6	8	22	234	18	0.1	0.098	0.124	0.005	689	71	-856.9	0.37	0.38	0.37	0.8	90	10	299.8	3	0	0.76	88	1011	3
6	8	22	234	19	-1.2	0.044	-9	-9	-999	22	6.3	0.655	0.64	1	0.6	44	10	298	3	0	0	94	1011	7
6	8	22	234	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	57	10	297.9	3	0	0	94	1012	7
6	8	22	234	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	297.9	3	0	0	94	1013	7
6	8	22	234	22	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	94	1012	7
6	8	22	234	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	97	1012	0
6	8	22	234	24	-0.6	0.03	-9	-9	-999	12	4	0.37	0.38	1	0.5	108	10	298	3	0	0	94	1011	7
6	8	23	235	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	82	10	298	3	0	0	100	1010	7
6	8	23	235	2	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	64	10	298.1	3	0	0	97	1009	7
6	8	23	235	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.9	3	0	0	94	1009	7
6	8	23	235	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	110	10	297.9	3	0	3.56	100	1010	7
6	8	23	235	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	105	10	298.1	3	0	0.51	94	1010	7
6	8	23	235	6	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	93	10	298.9	3	0	0	88	1010	7
6	8	23	235	7	-2	0.067	-9	-9	-999	40	13.2	0.37	0.38	0.47	1.1	114	10	300.8	3	0	0.25	82	1011	0
6	8	23	235	8	44.6	0.238	0.613	0.005	186	268	-27.4	0.37	0.38	0.25	1.6	107	10	302.8	3	0	0	82	1012	3
6	8	23	235	9	65	0.258	0.845	0.005	334	301	-23.8	0.37	0.38	0.2	1.7	123	10	303.1	3	0	0	80	1012	8
6	8	23	235	10	35.3	0.31	0.739	0.005	412	396	-76	0.37	0.38	0.19	2.3	129	10	301	3	0	6.1	70	1012	10
6	8	23	235	11	0.1	0.184	0.104	0.005	408	190	-5664.1	0.736	0.77	0.17	1.2	146	10	296.9	3	0	1.52	94	1013	10
6	8	23	235	12	2.3	0.095	0.297	0.005	414	71	-34.1	0.736	0.77	0.17	0.5	184	10	297.1	3	0	7.11	97	1012	10
6	8	23	235	13	7.2	-9	-9	-9	430	-999	-99999	0.542	0.56	0.16	0	0	10	297.5	3	0	1.52	94	1011	10
6	8	23	235	14	20.9	-9	-9	-9	478	-999	-99999	0.542	0.56	0.16	0	0	10	298.2	3	0	0	97	1010	10
6	8	23	235	15	29.8	0.166	0.805	0.005	629	156	-13.9	0.655	0.64	0.18	0.8	46	10	298.8	3	0	0	88	1009	10
6	8	23	235	16	20.8	0.16	0.76	0.005	759	147	-17.6	0.655	0.64	0.19	0.8	60	10	299.1	3	0	0	82	1009	10
6	8	23	235	17	0.9	0.124	0.266	0.005	764	101	-197	0.655	0.64	0.22	0.8	50	10	299.1	3	0	0	85	1009	10
6	8	23	235	18	0.1	0.147	0.129	0.005	763	130	-2887	0.655	0.64	0.36	1	78	10	299	3	0	0	82	1010	7
6	8	23	235	19	-6.5	0.097	-9	-9	-999	70	12.6	0.37	0.38	1	1.6	90	10	298.1	3	0	0	94	1010	7
6	8	23	235	20	-2.1	0.061	-9	-9	-999	34	9.7	0.37	0.38	1	1	106	10	297.4	3	0	0	93	1010	10
6	8	23	235	21	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	68	10	297	3	0	0.25	94	1011	10
6	8	23	235	22	-1	0.042	-9	-9	-999	20	6.8	0.37	0.38	1	0.7	86	10	297	3	0	0	94	1010	10
6	8	23	235	23	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	56	10	297.1	3	0	0	88	1010	10
6	8	23	235	24	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	73	10	297.1	3	0	0	88	1009	10
6	8	24	236	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	131	10	297.5	3	0	0	88	1009	7
6	8	24	236	2	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	158	10	298.4	3	0	0	91	1009	7
6	8	24	236	3	-1.3	0.046	-9	-9	-999	23	6.7	0.736	0.77	1	0.6	162	10	298.5	3	0	0	94	1009	7
6	8	24	236	4	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	178	10	298.5	3	0	0.25	100	1009	7
6	8	24	236	5	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	161	10	298.5	3	0	0	97	1009	7
6	8	24	236	6	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	178	10	298.1	3	0	0.25	94	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	24	236	7	-0.2	0.03	-9	-9	-999	12	12.2	0.37	0.38	0.47	0.5	96	10	298.4	3	0	0.51	94	1010	10
6	8	24	236	8	0.1	0.104	0.019	0.005	3	77	-1015.7	0.655	0.64	0.24	0.7	84	10	297.9	3	0	2.03	97	1011	10
6	8	24	236	9	2.2	-9	-9	-9	59	-999	-99999	0.542	0.56	0.18	0	0	10	297.9	3	0	0.76	100	1011	10
6	8	24	236	10	19.5	0.343	0.42	0.005	136	462	-186.1	0.736	0.77	0.18	2.1	199	10	299.4	3	0	0.51	100	1011	10
6	8	24	236	11	30	0.289	0.554	0.005	204	358	-72.1	0.686	0.72	0.15	1.7	216	10	300.4	3	0	0	94	1010	10
6	8	24	236	12	58.4	0.278	0.816	0.005	335	337	-33.1	0.686	0.72	0.15	1.5	241	10	301.1	3	0	0	94	1009	10
6	8	24	236	13	39.6	0.207	0.777	0.005	425	219	-20.2	0.265	0.28	0.14	1.5	275	10	301.8	3	0	0.25	85	1008	10
6	8	24	236	14	83.3	0.219	1.124	0.005	614	236	-11.4	0.686	0.72	0.15	1	234	10	302.8	3	0	0	85	1008	10
6	8	24	236	15	29.1	-9	-9	-9	677	-999	-99999	0.542	0.56	0.17	0	0	10	301.6	3	0	0	85	1008	10
6	8	24	236	16	23.4	0.201	0.78	0.006	728	208	-31.4	0.655	0.64	0.19	1.1	356	10	300.8	3	0	0	91	1008	10
6	8	24	236	17	0.1	0.147	0.127	0.006	726	131	-2881.2	0.655	0.64	0.22	1	30	10	299.9	3	0	1.02	91	1008	10
6	8	24	236	18	0.1	0.104	0.127	0.006	724	77	-1013.7	0.655	0.64	0.36	0.7	81	10	298.9	3	0	2.03	100	1009	7
6	8	24	236	19	-8.9	0.119	-9	-9	-999	95	17.2	0.686	0.72	1	1.6	232	10	297.4	3	0	15.49	100	1010	7
6	8	24	236	20	-1.8	0.054	-9	-9	-999	30	7.8	0.736	0.77	1	0.7	141	10	297.2	3	0	0	94	1010	7
6	8	24	236	21	-3.6	0.077	-9	-9	-999	49	11.2	0.736	0.77	1	1	142	10	296.9	3	0	0.25	100	1011	7
6	8	24	236	22	-7.1	0.107	-9	-9	-999	81	15.7	0.736	0.77	1	1.4	167	10	296.2	3	0	2.79	100	1012	7
6	8	24	236	23	-3.6	0.084	-9	-9	-999	56	15.1	0.736	0.77	1	1.1	148	10	296.2	3	0	2.79	97	1011	10
6	8	24	236	24	-3.5	0.079	-9	-9	-999	51	12.6	0.37	0.38	1	1.3	137	10	296.4	3	0	0.76	100	1011	10
6	8	25	237	1	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	138	10	296.2	3	0	0.76	100	1010	7
6	8	25	237	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	106	10	296.2	3	0	0	97	1009	7
6	8	25	237	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.2	3	0	0	100	1009	7
6	8	25	237	4	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	69	10	296.1	3	0	0	100	1009	7
6	8	25	237	5	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	69	10	296	3	0	0	97	1009	0
6	8	25	237	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.8	3	0	0	97	1010	7
6	8	25	237	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.45	0	0	10	299.1	3	0	0	94	1011	0
6	8	25	237	8	28.7	0.157	0.515	0.005	172	143	-12.2	0.736	0.77	0.24	0.7	147	10	299.6	3	0	2.54	91	1012	9
6	8	25	237	9	49.5	0.183	0.72	0.005	272	180	-11.1	0.736	0.77	0.19	0.8	183	10	300.6	3	0	0	94	1012	10
6	8	25	237	10	2.6	0.266	0.272	0.005	276	316	-650.6	0.736	0.77	0.18	1.7	162	10	297.9	3	0	11.43	88	1012	10
6	8	25	237	11	7.5	0.118	0.394	0.005	291	108	-19.5	0.655	0.64	0.18	0.6	44	10	297.4	3	0	0.25	94	1012	10
6	8	25	237	12	31.5	0.139	0.677	0.005	355	119	-7.7	0.655	0.64	0.18	0.6	44	10	298.2	3	0	0	91	1011	10
6	8	25	237	13	56	0.15	0.901	0.005	470	133	-5.4	0.655	0.64	0.18	0.6	66	10	300.1	3	0	0	88	1010	10
6	8	25	237	14	31.7	0.143	0.975	0.006	1052	125	-8.3	0.37	0.38	0.18	0.8	89	10	301.2	3	0	0	85	1009	10
6	8	25	237	15	30.4	0.187	0.969	0.006	1077	187	-19.5	0.37	0.38	0.19	1.2	108	10	301.1	3	0	0	77	1009	10
6	8	25	237	16	34.2	0.196	1.016	0.006	1102	199	-19.7	0.655	0.64	0.19	1	77	10	301	3	0	0	82	1008	10
6	8	25	237	17	10.5	0.181	0.687	0.006	1107	178	-50.9	0.37	0.38	0.23	1.3	95	10	300.4	3	0	0	82	1009	10
6	8	25	237	18	0.1	0.134	0.146	0.006	1107	113	-2173.9	0.37	0.38	0.37	1.1	89	10	298.8	3	0	0	88	1009	7
6	8	25	237	19	-2.2	0.059	-9	-9	-999	35	8.4	0.655	0.64	1	0.8	66	10	298	3	0	0	94	1010	7
6	8	25	237	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	75	10	297.8	3	0	0	94	1011	7
6	8	25	237	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	297.5	3	0	0	88	1011	7
6	8	25	237	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	90	10	297.5	3	0	0	94	1011	7
6	8	25	237	23	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	297.4	3	0	0	94	1011	7
6	8	25	237	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	297.5	3	0	0	94	1010	7
6	8	26	238	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	80	10	297.4	3	0	0	100	1010	7
6	8	26	238	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	297.5	3	0	0	94	1009	7
6	8	26	238	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	105	10	297.6	3	0	0	94	1009	7
6	8	26	238	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	105	10	297.8	3	0	0	94	1009	7
6	8	26	238	5	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	95	10	297.6	3	0	0	97	1010	0
6	8	26	238	6	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	105	10	298.2	3	0	0	100	1010	7
6	8	26	238	7	-2	0.067	-9	-9	-999	40	13.3	0.37	0.38	0.47	1.1	101	10	300.8	3	0	0	94	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	26	238	8	49.8	0.23	0.916	0.005	557	254	-22.1	0.37	0.38	0.25	1.5	119	10	302.4	3	0	0	82	1012	0
6	8	26	238	9	100.5	0.291	1.317	0.005	822	362	-22.2	0.37	0.38	0.2	1.9	115	10	303.9	3	0	0	79	1012	0
6	8	26	238	10	106.9	0.271	1.401	0.005	929	325	-16.9	0.37	0.38	0.19	1.7	121	10	305.1	3	0	0	75	1012	6
6	8	26	238	11	52.5	0.376	1.124	0.005	977	531	-91.5	0.736	0.77	0.17	2.2	192	10	300.8	3	0	8.64	70	1012	10
6	8	26	238	12	27	0.185	0.908	0.005	1001	212	-21.2	0.37	0.38	0.18	1.2	135	10	298.4	3	0	1.52	66	1011	10
6	8	26	238	13	65.4	0.169	1.247	0.005	1068	159	-6.6	0.37	0.38	0.18	0.9	123	10	300.5	3	0	0	70	1010	9
6	8	26	238	14	76.1	0.229	1.347	0.005	1156	252	-14.2	0.37	0.38	0.18	1.4	123	10	302.4	3	0	0	66	1009	9
6	8	26	238	15	55.7	0.222	1.236	0.005	1221	241	-17.7	0.37	0.38	0.19	1.4	96	10	301.9	3	0	0	70	1009	9
6	8	26	238	16	25.5	0.203	0.96	0.005	1250	211	-29.6	0.655	0.64	0.19	1.1	73	10	301.4	3	0	0	75	1009	10
6	8	26	238	17	1.1	0.126	0.339	0.005	1248	104	-160.1	0.655	0.64	0.22	0.8	84	10	299.6	3	0	0	88	1009	10
6	8	26	238	18	0.1	0.098	0.152	0.005	1247	71	-855.5	0.37	0.38	0.38	0.8	89	10	299.1	3	0	0	94	1009	3
6	8	26	238	19	-1.4	0.044	-9	-9	-999	22	5.6	0.655	0.64	1	0.6	79	10	298.8	3	0	0	88	1009	3
6	8	26	238	20	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	55	10	298.4	3	0	0	94	1010	3
6	8	26	238	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	298.1	3	0	0	94	1010	3
6	8	26	238	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	298	3	0	0	94	1010	3
6	8	26	238	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	89	10	297.9	3	0	0	94	1010	3
6	8	26	238	24	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	86	10	297.6	3	0	0	100	1010	3
6	8	27	239	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	66	10	297.5	3	0	0	100	1010	3
6	8	27	239	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	58	10	297.5	3	0	0	97	1009	3
6	8	27	239	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	65	10	297.4	3	0	0	100	1009	3
6	8	27	239	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	103	10	297.4	3	0	0	88	1009	3
6	8	27	239	5	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	82	10	297.1	3	0	0	97	1010	3
6	8	27	239	6	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	93	10	297.4	3	0	0	94	1010	7
6	8	27	239	7	-1.1	0.049	-9	-9	-999	25	9.7	0.37	0.38	0.47	0.8	101	10	300.5	3	0	0	100	1010	0
6	8	27	239	8	62.7	0.191	0.868	0.005	376	192	-10	0.37	0.38	0.25	1.1	87	10	302.9	3	0	0	88	1011	0
6	8	27	239	9	44.9	0.25	0.872	0.005	533	287	-31.2	0.37	0.38	0.2	1.7	103	10	301.9	3	0	0	75	1012	9
6	8	27	239	10	50	0.241	0.994	0.005	708	272	-25.2	0.37	0.38	0.19	1.6	116	10	300.4	3	0	0.25	75	1012	9
6	8	27	239	11	157.8	0.342	1.598	0.005	934	461	-22.9	0.736	0.77	0.17	1.7	148	10	302.1	3	0	0	61	1011	8
6	8	27	239	12	94.1	0.257	1.395	0.005	1041	302	-16.2	0.37	0.38	0.18	1.6	137	10	303.2	3	0	0	66	1010	9
6	8	27	239	13	86	0.221	1.396	0.005	1140	239	-11.3	0.37	0.38	0.18	1.3	116	10	304.8	3	0	0	58	1009	9
6	8	27	239	14	63.1	0.263	1.284	0.005	1209	311	-26	0.655	0.64	0.18	1.4	357	10	303.4	3	0	0	59	1009	10
6	8	27	239	15	111.5	0.345	1.604	0.005	1334	466	-33.1	0.655	0.64	0.18	1.9	339	10	303.4	3	0	0	59	1008	8
6	8	27	239	16	61.6	0.301	1.338	0.005	1400	381	-40	0.655	0.64	0.19	1.7	346	10	302.2	3	0	0.25	59	1008	9
6	8	27	239	17	5.1	0.152	0.584	0.005	1401	150	-62	0.655	0.64	0.22	0.9	3	10	300.8	3	0	0	63	1009	10
6	8	27	239	18	0.1	0.087	0.158	0.005	1400	60	-582.9	0.37	0.38	0.38	0.7	87	10	300.1	3	0	0	74	1009	7
6	8	27	239	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	299.2	3	0	0	77	1009	7
6	8	27	239	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	100	10	298.8	3	0	0	88	1010	0
6	8	27	239	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	298.2	3	0	0	88	1011	7
6	8	27	239	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	73	10	297.9	3	0	0	88	1011	7
6	8	27	239	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	110	10	297.4	3	0	0	94	1011	0
6	8	27	239	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	297.2	3	0	0	100	1010	7
6	8	28	240	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	60	10	297	3	0	0	94	1010	7
6	8	28	240	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	62	10	296.9	3	0	0	97	1010	0
6	8	28	240	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	75	10	296.8	3	0	0	94	1009	7
6	8	28	240	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	105	10	296.8	3	0	0	100	1009	7
6	8	28	240	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	122	10	296.9	3	0	0	97	1010	7
6	8	28	240	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	108	10	297.4	3	0	0	100	1011	7
6	8	28	240	7	-1	0.103	-9	-9	-999	76	101	0.736	0.77	0.46	0.8	146	10	297.9	3	0	0	94	1011	10
6	8	28	240	8	16.6	0.133	0.372	0.008	112	111	-12.8	0.37	0.38	0.25	0.8	102	10	298.9	3	0	0	97	1012	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	28	240	9	11	0.209	0.339	0.006	128	220	-75	0.736	0.77	0.19	1.2	143	10	298.9	3	0	0	85	1012	10
6	8	28	240	10	37.3	0.232	0.574	0.005	182	258	-30.3	0.736	0.77	0.18	1.2	144	10	299	3	0	0	94	1012	10
6	8	28	240	11	65.5	0.248	0.798	0.005	279	283	-20.9	0.37	0.38	0.18	1.6	137	10	301	3	0	0	80	1012	9
6	8	28	240	12	113	0.284	1.12	0.005	448	348	-18.3	0.37	0.38	0.18	1.8	129	10	303.4	3	0	0	75	1011	8
6	8	28	240	13	94.4	0.279	1.294	0.005	828	339	-20.7	0.37	0.38	0.18	1.8	129	10	303.9	3	0	0	75	1010	8
6	8	28	240	14	79.3	0.296	1.271	0.006	932	370	-29.3	0.37	0.38	0.18	2	130	10	304	3	0	0	70	1009	9
6	8	28	240	15	38.6	0.257	1.017	0.006	981	301	-39.7	0.37	0.38	0.19	1.8	125	10	303	3	0	0	70	1008	10
6	8	28	240	16	20.6	0.213	0.832	0.006	1006	227	-42.4	0.37	0.38	0.19	1.5	127	10	302.4	3	0	0	70	1009	10
6	8	28	240	17	1.3	0.129	0.331	0.006	1005	109	-149.9	0.37	0.38	0.23	1	110	10	301.1	3	0	0	75	1009	10
6	8	28	240	18	0.1	0.098	0.141	0.006	1003	71	-855.5	0.37	0.38	0.38	0.8	109	10	300	3	0	0	79	1009	7
6	8	28	240	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	299.4	3	0	0	82	1010	3
6	8	28	240	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	88	10	298.9	3	0	0	91	1010	0
6	8	28	240	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	99	10	298.6	3	0	0	94	1011	7
6	8	28	240	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	103	10	298.4	3	0	0	94	1011	7
6	8	28	240	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	298.2	3	0	0	97	1011	7
6	8	28	240	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	76	10	298	3	0	0	100	1011	7
6	8	29	241	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	73	10	297.6	3	0	0	94	1010	7
6	8	29	241	2	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	99	10	297.5	3	0	0	94	1010	0
6	8	29	241	3	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	108	10	297.4	3	0	0	100	1010	3
6	8	29	241	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	116	10	297.2	3	0	0	100	1010	3
6	8	29	241	5	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	119	10	297.1	3	0	0	100	1010	3
6	8	29	241	6	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	80	10	298.4	3	0	0	100	1011	3
6	8	29	241	7	-1.3	0.055	-9	-9	-999	29	11.5	0.37	0.38	0.46	0.9	97	10	301.8	3	0	0	94	1012	0
6	8	29	241	8	56.1	0.233	0.929	0.005	516	259	-20.3	0.37	0.38	0.25	1.5	132	10	303.5	3	0	0	56	1013	0
6	8	29	241	9	86.3	0.265	1.201	0.005	726	315	-19.6	0.37	0.38	0.2	1.7	136	10	304.4	3	0	0	75	1013	4
6	8	29	241	10	104.6	0.293	1.375	0.005	898	364	-21.6	0.37	0.38	0.19	1.9	130	10	305.5	3	0	0	70	1013	7
6	8	29	241	11	125.4	0.287	1.545	0.005	1063	354	-17	0.37	0.38	0.18	1.8	137	10	306.2	3	0	0	61	1012	7
6	8	29	241	12	105.5	0.271	1.515	0.005	1189	325	-17	0.37	0.38	0.18	1.7	126	10	306.4	3	0	0	60	1012	8
6	8	29	241	13	87.9	0.287	1.46	0.005	1279	354	-24.4	0.37	0.38	0.18	1.9	123	10	306.1	3	0	0	60	1010	9
6	8	29	241	14	96.6	0.29	1.546	0.005	1379	360	-22.8	0.37	0.38	0.18	1.9	126	10	306.1	3	0	0	60	1010	8
6	8	29	241	15	67.5	0.259	1.389	0.005	1432	304	-23.2	0.37	0.38	0.19	1.7	124	10	306	3	0	0	56	1009	9
6	8	29	241	16	29.1	0.241	1.052	0.005	1445	272	-43.3	0.37	0.38	0.19	1.7	120	10	304.9	3	0	0	58	1009	10
6	8	29	241	17	8.1	0.2	0.687	0.005	1447	206	-89	0.37	0.38	0.23	1.5	118	10	303.2	3	0	0	61	1010	10
6	8	29	241	18	0.1	0.146	0.159	0.005	1444	129	-2815.2	0.37	0.38	0.38	1.2	111	10	301.1	3	0	0	75	1010	3
6	8	29	241	19	-1.8	0.049	-9	-9	-999	32	5.6	0.37	0.38	1	0.8	88	10	300.2	3	0	0	79	1011	3
6	8	29	241	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	299.8	3	0	0	85	1012	3
6	8	29	241	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	299.2	3	0	0	82	1013	3
6	8	29	241	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	299	3	0	0	82	1013	3
6	8	29	241	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	97	10	298.8	3	0	0	88	1013	0
6	8	29	241	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	104	10	298.5	3	0	0	88	1012	3
6	8	30	242	1	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	101	10	298.8	3	0	0	94	1012	3
6	8	30	242	2	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	90	10	298	3	0	0	91	1011	3
6	8	30	242	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.9	3	0	0	94	1011	3
6	8	30	242	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	297.6	3	0	0	94	1012	3
6	8	30	242	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	62	10	297.5	3	0	0	94	1012	3
6	8	30	242	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	298.9	3	0	0	94	1012	3
6	8	30	242	7	-1.2	0.055	-9	-9	-999	29	12	0.37	0.38	0.46	0.9	103	10	302.6	3	0	0	88	1013	0
6	8	30	242	8	66.6	0.269	1.052	0.007	632	322	-26.5	0.37	0.38	0.25	1.8	116	10	303.8	3	0	0	80	1013	0
6	8	30	242	9	87.5	0.298	1.194	0.007	704	374	-27.4	0.37	0.38	0.2	2	127	10	304.5	3	0	0	75	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	8	30	242	10	112.1	0.272	1.352	0.007	796	327	-16.3	0.37	0.38	0.19	1.7	119	10	305.6	3	0	0	66	1013	6
6	8	30	242	11	101.4	0.258	1.342	0.006	862	302	-15.4	0.37	0.38	0.18	1.6	109	10	305.9	3	0	0	60	1012	8
6	8	30	242	12	117	0.24	1.447	0.005	935	271	-10.7	0.37	0.38	0.18	1.4	115	10	306.8	3	0	0	56	1012	8
6	8	30	242	13	111	0.239	1.456	0.005	1005	268	-11.1	0.37	0.38	0.18	1.4	123	10	307.2	3	0	0	56	1011	8
6	8	30	242	14	107	0.26	1.47	0.005	1071	305	-14.8	0.37	0.38	0.18	1.6	121	10	306.9	3	0	0	56	1010	8
6	8	30	242	15	65	0.28	1.26	0.005	1110	340	-30.4	0.37	0.38	0.19	1.9	121	10	306	3	0	0	56	1009	9
6	8	30	242	16	13.9	0.218	0.755	0.005	1116	235	-66.8	0.37	0.38	0.19	1.6	115	10	304.2	3	0	0	58	1009	10
6	8	30	242	17	3	0.191	0.454	0.005	1115	192	-207.2	0.37	0.38	0.23	1.5	113	10	302.5	3	0	0	68	1010	10
6	8	30	242	18	0.1	0.146	0.146	0.005	1113	129	-2815.2	0.37	0.38	0.39	1.2	109	10	301	3	0	0	75	1010	3
6	8	30	242	19	-2.3	0.055	-9	-9	-999	34	6.3	0.37	0.38	1	0.9	96	10	300.1	3	0	0	79	1011	3
6	8	30	242	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	299.5	3	0	0	79	1012	3
6	8	30	242	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	74	10	298.9	3	0	0	82	1012	3
6	8	30	242	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	298.2	3	0	0	82	1012	3
6	8	30	242	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	84	10	297.9	3	0	0	94	1012	3
6	8	30	242	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	47	10	297.5	3	0	0	94	1012	3
6	8	31	243	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	297.2	3	0	0	94	1011	3
6	8	31	243	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	80	10	297.2	3	0	0	100	1011	3
6	8	31	243	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.1	3	0	0	94	1011	3
6	8	31	243	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	297.1	3	0	0	100	1011	3
6	8	31	243	5	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	64	10	296.9	3	0	0	94	1012	3
6	8	31	243	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	298.4	3	0	0	97	1012	3
6	8	31	243	7	-1.3	0.059	-9	-9	-999	33	13.8	0.655	0.64	0.46	0.8	65	10	301.4	3	0	0	88	1013	0
6	8	31	243	8	89.1	0.232	1.176	0.005	660	257	-12.7	0.655	0.64	0.24	1.1	82	10	303.1	3	0	0	77	1013	0
6	8	31	243	9	99.5	0.247	1.324	0.005	843	282	-13.6	0.37	0.38	0.2	1.5	107	10	304.5	3	0	0	70	1013	0
6	8	31	243	10	108.3	0.249	1.407	0.005	930	286	-12.9	0.37	0.38	0.19	1.5	116	10	305.4	3	0	0	59	1013	6
6	8	31	243	11	135.7	0.221	1.574	0.005	1041	239	-7.2	0.37	0.38	0.18	1.2	99	10	306.9	3	0	0	57	1013	6
6	8	31	243	12	137.8	-9	-9	-9	1152	-999	-99999	0.542	0.56	0.16	0	0	10	307	3	0	0	55	1012	8
6	8	31	243	13	105.8	0.277	1.535	0.005	1235	336	-18.2	0.655	0.64	0.18	1.4	342	10	305.1	3	0	0	54	1011	9
6	8	31	243	14	161.6	0.384	1.827	0.005	1364	548	-31.6	0.655	0.64	0.18	2.1	345	10	304.9	3	0	0	51	1011	8
6	8	31	243	15	125.4	0.309	1.721	0.005	1466	399	-21.3	0.655	0.64	0.18	1.6	348	10	305.4	3	0	0	54	1010	8
6	8	31	243	16	36.7	0.224	1.15	0.005	1495	246	-27.5	0.37	0.38	0.19	1.5	102	10	305.2	3	0	0	52	1010	10
6	8	31	243	17	10.5	0.192	0.759	0.005	1499	194	-60.8	0.37	0.38	0.23	1.4	111	10	303.4	3	0	0	57	1010	10
6	8	31	243	18	0.1	0.134	0.161	0.005	1491	114	-2177.5	0.37	0.38	0.39	1.1	112	10	300.8	3	0	0	70	1011	3
6	8	31	243	19	-1.8	0.049	-9	-9	-999	29	5.6	0.37	0.38	1	0.8	97	10	299.9	3	0	0	74	1012	3
6	8	31	243	20	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	88	10	299.2	3	0	0	77	1013	0
6	8	31	243	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	96	10	298.8	3	0	0	77	1013	3
6	8	31	243	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	298.4	3	0	0	88	1013	3
6	8	31	243	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	95	10	297.9	3	0	0	85	1012	0
6	8	31	243	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	297.9	3	0	0	94	1011	3
6	9	1	244	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	102	10	297.4	3	0	0	94	1011	3
6	9	1	244	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	96	10	297.1	3	0	0	97	1010	3
6	9	1	244	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	99	10	296.9	3	0	0	100	1010	3
6	9	1	244	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	96	10	296.9	3	0	0	97	1010	3
6	9	1	244	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	87	10	296.8	3	0	0	97	1010	0
6	9	1	244	6	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	104	10	298.4	3	0	0	100	1011	3
6	9	1	244	7	-1.2	0.052	-9	-9	-999	27	10.4	0.212	0.48	0.46	1	98	10	301.5	3	0	0	90	1012	0
6	9	1	244	8	77.5	0.201	0.76	0.01	204	207	-9.4	0.212	0.48	0.24	1.4	96	10	302.9	3	0	0	77	1012	0
6	9	1	244	9	116.8	0.23	1.022	0.008	330	253	-9.3	0.212	0.48	0.19	1.6	96	10	304.5	3	0	0	70	1012	0
6	9	1	244	10	126.9	0.212	1.18	0.006	467	225	-6.8	0.212	0.48	0.18	1.4	109	10	305.2	3	0	0	63	1012	6

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	1	244	11	130.8	0.223	1.281	0.005	580	242	-7.6	0.212	0.48	0.18	1.5	97	10	305.9	3	0	0	56	1012	8
6	9	1	244	12	149.1	0.236	1.486	0.005	795	264	-8	0.212	0.48	0.18	1.6	104	10	306.5	3	0	0	56	1010	7
6	9	1	244	13	144.9	0.226	1.547	0.005	921	246	-7.1	0.212	0.48	0.18	1.5	101	10	306.9	3	0	0	50	1009	7
6	9	1	244	14	78.6	0.221	1.292	0.005	986	238	-12.3	0.212	0.48	0.18	1.6	98	10	305.9	3	0	0	54	1009	9
6	9	1	244	15	51.4	0.221	1.137	0.005	1029	239	-18.8	0.212	0.48	0.18	1.7	108	10	305.1	3	0	0	56	1009	10
6	9	1	244	16	10.2	0.186	0.665	0.005	1034	184	-56.4	0.212	0.48	0.19	1.6	114	10	303.5	3	0	0	58	1009	10
6	9	1	244	17	3.6	0.157	0.469	0.005	1034	143	-96.8	0.212	0.48	0.23	1.4	116	10	302.5	3	0	0	61	1009	10
6	9	1	244	18	0.1	0.115	0.142	0.005	1030	90	-1368.5	0.212	0.48	0.39	1.1	115	10	300.9	3	0	0	70	1009	3
6	9	1	244	19	-1.8	0.047	-9	-9	-999	25	5	0.212	0.48	1	0.9	114	10	299.8	3	0	0	82	1009	3
6	9	1	244	20	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	110	10	299.1	3	0	0	88	1010	0
6	9	1	244	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	89	10	298.8	3	0	0	82	1011	3
6	9	1	244	22	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	74	10	298.2	3	0	0	88	1011	3
6	9	1	244	23	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	66	10	297.9	3	0	0	88	1010	0
6	9	1	244	24	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	71	10	297.4	3	0	0	85	1010	3
6	9	2	245	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	71	10	296.9	3	0	0	90	1009	3
6	9	2	245	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	106	10	296.9	3	0	0	97	1008	0
6	9	2	245	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	296.4	3	0	0	100	1008	3
6	9	2	245	4	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	81	10	296.4	3	0	0	93	1008	0
6	9	2	245	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	40	10	296	3	0	0	93	1009	0
6	9	2	245	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	297.6	3	0	0	93	1009	3
6	9	2	245	7	-1.2	0.056	-9	-9	-999	30	12.7	0.562	0.7	0.46	0.8	69	10	301	3	0	0	90	1010	0
6	9	2	245	8	91.7	0.223	1.171	0.006	631	242	-10.9	0.562	0.7	0.24	1.1	85	10	303.1	3	0	0	77	1011	0
6	9	2	245	9	106.5	0.208	1.289	0.006	726	218	-7.6	0.212	0.48	0.19	1.4	97	10	304.4	3	0	0	70	1011	0
6	9	2	245	10	131.7	0.161	1.46	0.006	852	149	-2.8	0.212	0.48	0.18	0.9	98	10	305.9	3	0	0	66	1011	6
6	9	2	245	11	202.9	0.153	1.776	0.005	996	138	-1.6	0.562	0.7	0.18	0.5	14	10	306.9	3	0	0	60	1010	6
6	9	2	245	12	166.2	0.306	1.722	0.005	1107	389	-15.5	0.562	0.7	0.18	1.6	335	10	305.5	3	0	0	56	1009	8
6	9	2	245	13	58.8	0.312	1.232	0.005	1144	401	-46.3	0.562	0.7	0.18	1.9	341	10	303.6	3	0	0	56	1008	10
6	9	2	245	14	162.1	0.305	1.782	0.005	1256	387	-15.7	0.562	0.7	0.18	1.6	334	10	305.2	3	0	0	58	1007	8
6	9	2	245	15	77.4	0.187	1.413	0.005	1311	192	-7.5	0.24	0.3	0.16	1.2	278	10	306.4	3	0	0	56	1007	8
6	9	2	245	16	42	0.174	1.16	0.005	1336	167	-11.3	0.24	0.3	0.17	1.2	320	10	304.9	3	0	0	58	1007	9
6	9	2	245	17	21	0.228	0.924	0.005	1346	250	-50.4	0.562	0.7	0.23	1.4	345	10	303.2	3	0	0	63	1007	10
6	9	2	245	18	0.1	0.074	0.155	0.005	1343	70	-370.9	0.212	0.48	0.39	0.7	86	10	301.9	3	0	0	70	1008	3
6	9	2	245	19	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	109	10	300.5	3	0	0	77	1008	3
6	9	2	245	20	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	118	10	299.8	3	0	0	82	1009	3
6	9	2	245	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	117	10	299	3	0	0	88	1009	3
6	9	2	245	22	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	111	10	298.9	3	0	0	94	1009	3
6	9	2	245	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	57	10	298.1	3	0	0	91	1009	3
6	9	2	245	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	70	10	297.6	3	0	0	94	1008	3
6	9	3	246	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	297.6	3	0	0	94	1008	3
6	9	3	246	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	71	10	297.4	3	0	0	94	1007	3
6	9	3	246	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	297.2	3	0	0	94	1007	3
6	9	3	246	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	93	10	296.9	3	0	0	94	1007	3
6	9	3	246	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	98	10	297.1	3	0	0	100	1008	3
6	9	3	246	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	84	10	298.4	3	0	0	94	1008	7
6	9	3	246	7	-0.8	0.042	-9	-9	-999	19	8.5	0.212	0.48	0.46	0.8	86	10	301.8	3	0	0	88	1009	0
6	9	3	246	8	68.3	0.158	1.185	0.005	876	145	-5.2	0.212	0.48	0.24	1	94	10	303.9	3	0	0	82	1009	0
6	9	3	246	9	102.4	0.197	1.425	0.005	1019	202	-6.8	0.212	0.48	0.19	1.3	99	10	305.1	3	0	0	70	1010	0
6	9	3	246	10	112.7	0.11	1.544	0.005	1177	87	-1.1	0.212	0.48	0.18	0.5	95	10	306.4	3	0	0	66	1010	7
6	9	3	246	11	116.3	0.269	1.628	0.005	1336	320	-15	0.562	0.7	0.18	1.4	334	10	304.8	3	0	0	64	1009	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	3	246	12	54.7	0.236	1.289	0.006	1409	264	-21.5	0.562	0.7	0.18	1.3	336	10	303.1	3	0	1.52	60	1008	10
6	9	3	246	13	4.2	0.163	0.549	0.006	1409	153	-92.1	0.24	0.3	0.16	1.4	253	10	299.9	3	0	2.54	56	1008	10
6	9	3	246	14	20.7	-9	-9	-9	1438	-999	-99999	0.475	0.6	0.17	0	0	10	300	3	0	0	59	1007	10
6	9	3	246	15	17.5	-9	-9	-9	1463	-999	-99999	0.475	0.6	0.18	0	0	10	300.8	3	0	0	80	1007	10
6	9	3	246	16	9.5	0.141	0.732	0.006	1477	122	-26.3	0.562	0.7	0.19	0.8	6	10	300.9	3	0	0	80	1007	10
6	9	3	246	17	0.1	0.099	0.16	0.006	1476	71	-863.6	0.562	0.7	0.23	0.7	51	10	300.4	3	0	0	75	1007	10
6	9	3	246	18	0.1	0.072	0.16	0.006	1474	44	-334.8	0.562	0.7	0.39	0.5	77	10	299.9	3	0	0	82	1008	7
6	9	3	246	19	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	299.4	3	0	0	94	1008	7
6	9	3	246	20	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	85	10	299.1	3	0	0	94	1009	0
6	9	3	246	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	102	10	298.6	3	0	0	94	1009	7
6	9	3	246	22	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	109	10	298.4	3	0	0	94	1009	3
6	9	3	246	23	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	90	10	298.1	3	0	0	97	1009	0
6	9	3	246	24	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	297.9	3	0	0	94	1008	3
6	9	4	247	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	84	10	297.8	3	0	0	94	1007	3
6	9	4	247	2	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	63	10	297.4	3	0	0	94	1007	3
6	9	4	247	3	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	107	10	297.4	3	0	0	100	1007	0
6	9	4	247	4	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	129	10	297.1	3	0	0	100	1007	0
6	9	4	247	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	104	10	297.2	3	0	0	100	1008	3
6	9	4	247	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	89	10	298.5	3	0	0	94	1009	3
6	9	4	247	7	-0.6	0.042	-9	-9	-999	20	10.2	0.562	0.7	0.45	0.6	76	10	302.2	3	0	0	88	1009	0
6	9	4	247	8	78.2	0.129	0.809	0.005	243	106	-2.5	0.212	0.48	0.24	0.7	93	10	304.2	3	0	0	79	1010	0
6	9	4	247	9	101.7	0.121	1.149	0.005	538	97	-1.6	0.212	0.48	0.19	0.6	111	10	305.5	3	0	0	70	1011	5
6	9	4	247	10	111.9	0.187	1.292	0.005	696	186	-5.3	0.562	0.7	0.18	0.8	354	10	304.4	3	0	0	66	1010	8
6	9	4	247	11	72	0.292	1.164	0.005	789	363	-31.2	0.562	0.7	0.18	1.7	341	10	303.5	3	0	0	63	1010	10
6	9	4	247	12	2.7	-9	-9	-9	786	-999	-99999	0.475	0.6	0.17	0	0	10	298.9	3	0	46.99	61	1010	10
6	9	4	247	13	16	0.123	0.708	0.005	800	99	-10.4	0.562	0.7	0.18	0.6	57	10	298.2	3	0	0	59	1009	10
6	9	4	247	14	23.1	0.15	0.808	0.005	822	134	-13.2	0.212	0.48	0.18	1.1	95	10	298.5	3	0	0	100	1009	10
6	9	4	247	15	24.6	0.151	0.834	0.005	845	135	-12.6	0.212	0.48	0.18	1.1	95	10	298.9	3	0	0	100	1008	10
6	9	4	247	16	14.4	0.115	0.701	0.005	859	89	-9.4	0.212	0.48	0.19	0.8	112	10	299.8	3	0	0	82	1008	10
6	9	4	247	17	1.1	0.107	0.301	0.005	860	81	-97.8	0.562	0.7	0.23	0.7	78	10	299.6	3	0	0	85	1008	10
6	9	4	247	18	0.1	0.085	0.134	0.005	859	57	-556.7	0.562	0.7	0.4	0.6	62	10	298.8	3	0	0	88	1008	7
6	9	4	247	19	-0.8	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	101	10	298.4	3	0	0	91	1009	99
6	9	4	247	20	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	298.2	3	0	0	94	1010	3
6	9	4	247	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	70	10	297.9	3	0	0	94	1010	3
6	9	4	247	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	79	10	297.9	3	0	0	88	1011	3
6	9	4	247	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	297.6	3	0	0	88	1010	3
6	9	4	247	24	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	91	10	297.4	3	0	0	94	1010	3
6	9	5	248	1	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.2	3	0	0	94	1010	3
6	9	5	248	2	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	101	10	297.2	3	0	0	97	1009	7
6	9	5	248	3	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	106	10	297.2	3	0	0	100	1009	7
6	9	5	248	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	99	10	297.4	3	0	0	100	1010	3
6	9	5	248	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.4	3	0	0	97	1010	3
6	9	5	248	6	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	86	10	298.9	3	0	0	94	1011	7
6	9	5	248	7	-0.4	0.031	-9	-9	-999	13	6.6	0.212	0.48	0.45	0.6	113	10	301.9	3	0	0	100	1012	0
6	9	5	248	8	103.3	0.267	0.852	0.008	216	318	-16.7	0.687	0.8	0.24	1.3	141	10	304.2	3	0	0	82	1012	0
6	9	5	248	9	151.8	0.32	1.186	0.008	396	417	-19.5	0.687	0.8	0.19	1.6	169	10	304.5	3	0	0	75	1012	0
6	9	5	248	10	145.4	0.278	1.319	0.006	570	337	-13.3	0.687	0.8	0.18	1.3	142	10	305.1	3	0	0	70	1012	8
6	9	5	248	11	101.1	0.239	1.247	0.005	691	269	-12.1	0.687	0.8	0.18	1.1	173	10	305.4	3	0	0	64	1011	9
6	9	5	248	12	98.6	-9	-9	-9	811	-999	-99999	0.475	0.6	0.17	0	0	10	305.9	3	0	0	65	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	5	248	13	90.5	0.277	1.292	0.005	859	335	-21.1	0.687	0.8	0.18	1.4	183	10	304.4	3	0	0	66	1010	10
6	9	5	248	14	23	0.192	0.821	0.005	867	196	-27.8	0.562	0.7	0.18	1.1	66	10	300.9	3	0	0.25	56	1010	10
6	9	5	248	15	33.8	0.174	0.947	0.005	905	168	-14.2	0.562	0.7	0.18	0.9	65	10	299.9	3	0	0	94	1009	10
6	9	5	248	16	29.9	0.197	0.926	0.005	956	202	-23.2	0.562	0.7	0.19	1.1	70	10	300.4	3	0	0	94	1009	10
6	9	5	248	17	5	0.145	0.511	0.005	963	127	-55.2	0.562	0.7	0.23	0.9	70	10	300.1	3	0	0	88	1009	10
6	9	5	248	18	0.1	0.126	0.139	0.005	959	103	-1799.2	0.562	0.7	0.4	0.9	79	10	299.2	3	0	0	88	1009	7
6	9	5	248	19	-0.4	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	94	10	299	3	0	0	88	1010	99
6	9	5	248	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	298.9	3	0	0	88	1011	7
6	9	5	248	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	107	10	298.6	3	0	0	94	1012	7
6	9	5	248	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	95	10	298.5	3	0	0	100	1012	7
6	9	5	248	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.4	3	0	0	97	1012	7
6	9	5	248	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.1	3	0	0	97	1011	7
6	9	6	249	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	54	10	297.9	3	0	0	97	1010	99
6	9	6	249	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	72	10	297.8	3	0	0	97	1010	7
6	9	6	249	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	297.9	3	0	0	94	1010	7
6	9	6	249	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298	3	0	0	100	1010	7
6	9	6	249	5	-1.7	0.052	-9	-9	-999	27	7.6	0.687	0.8	1	0.7	142	10	298.8	3	0	1.78	100	1011	7
6	9	6	249	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	137	10	298.9	3	0	0	97	1012	3
6	9	6	249	7	-2.1	0.075	-9	-9	-999	47	17.8	0.687	0.8	0.46	1	168	10	300.5	3	0	0	94	1012	0
6	9	6	249	8	66	0.281	0.863	0.005	352	343	-30.5	0.687	0.8	0.24	1.5	207	10	302.2	3	0	0.25	88	1013	7
6	9	6	249	9	42	0.233	0.818	0.005	472	259	-27.1	0.24	0.3	0.17	1.8	262	10	302.4	3	0	0	80	1014	9
6	9	6	249	10	94.5	0.27	1.248	0.005	744	323	-18.9	0.24	0.3	0.16	2	273	10	303.2	3	0	0	75	1014	6
6	9	6	249	11	106.9	0.264	1.393	0.005	915	312	-15.5	0.24	0.3	0.16	1.9	272	10	304	3	0	0	82	1014	6
6	9	6	249	12	72.3	0.245	1.263	0.005	1007	278	-18.3	0.24	0.3	0.16	1.8	277	10	303.5	3	0	0	88	1013	9
6	9	6	249	13	69.2	0.243	1.281	0.005	1097	276	-18.8	0.24	0.3	0.16	1.8	280	10	303.9	3	0	0	85	1012	9
6	9	6	249	14	58.5	0.16	1.24	0.005	1174	149	-6.3	0.24	0.3	0.16	1	272	10	304.4	3	0	0	80	1011	9
6	9	6	249	15	65.1	0.118	1.307	0.005	1236	93	-2.3	0.24	0.3	0.16	0.6	321	10	305.1	3	0	0	70	1010	8
6	9	6	249	16	41	0.152	1.129	0.005	1264	136	-7.6	0.562	0.7	0.19	0.7	18	10	303.4	3	0	0	65	1011	10
6	9	6	249	17	11.6	0.156	0.743	0.005	1271	142	-29.5	0.562	0.7	0.23	0.9	23	10	302.4	3	0	0	67	1010	10
6	9	6	249	18	0.1	0.099	0.152	0.005	1269	72	-866.6	0.562	0.7	0.4	0.7	80	10	301	3	0	0	67	1011	7
6	9	6	249	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	110	10	300.1	3	0	0	77	1012	7
6	9	6	249	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	95	10	299.8	3	0	0	91	1012	7
6	9	6	249	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	299.4	3	0	0	74	1012	7
6	9	6	249	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	299	3	0	0	94	1012	7
6	9	6	249	23	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	98	10	298.6	3	0	0	91	1012	7
6	9	6	249	24	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	139	10	298.4	3	0	0	100	1011	7
6	9	7	250	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	112	10	298.5	3	0	0	100	1010	7
6	9	7	250	2	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	98	10	298	3	0	0	97	1010	7
6	9	7	250	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	106	10	298	3	0	0	94	1010	7
6	9	7	250	4	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	121	10	298.5	3	0	0	94	1010	7
6	9	7	250	5	-2.8	0.067	-9	-9	-999	40	9.7	0.687	0.8	1	0.9	145	10	298.4	3	0	0	94	1010	7
6	9	7	250	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	299.8	3	0	0	100	1010	7
6	9	7	250	7	-1.2	0.06	-9	-9	-999	34	15.8	0.687	0.8	0.46	0.8	156	10	302.5	3	0	0	94	1012	0
6	9	7	250	8	66.7	0.171	1.027	0.005	587	162	-6.8	0.687	0.8	0.24	0.7	148	10	303.5	3	0	0	88	1013	6
6	9	7	250	9	78.6	0.159	1.157	0.005	713	146	-4.6	0.687	0.8	0.19	0.6	170	10	304.2	3	0	0	75	1013	9
6	9	7	250	10	53.2	0.17	1.055	0.005	798	162	-8.4	0.562	0.7	0.18	0.8	333	10	304	3	0	0	66	1013	10
6	9	7	250	11	35.4	0.191	0.935	0.005	833	192	-17.7	0.24	0.3	0.16	1.4	332	10	303	3	0	0	60	1012	10
6	9	7	250	12	10.3	-9	-9	-9	841	-999	-99999	0.475	0.6	0.17	0	0	10	300	3	0	7.11	66	1011	10
6	9	7	250	13	47.2	0.14	1.051	0.005	887	121	-5.3	0.562	0.7	0.18	0.6	44	10	299.9	3	0	0.25	66	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	7	250	14	131.9	0.285	1.551	0.005	1020	350	-15.9	0.562	0.7	0.18	1.5	40	10	302.2	3	0	0	79	1010	9
6	9	7	250	15	91.1	0.182	1.412	0.005	1115	183	-6	0.562	0.7	0.18	0.8	70	10	304.2	3	0	0	94	1009	9
6	9	7	250	16	13.6	0.171	0.752	0.005	1123	162	-32.8	0.562	0.7	0.19	1	38	10	301.4	3	0	0	82	1009	10
6	9	7	250	17	1.6	0.066	0.369	0.005	1125	46	-16.3	0.212	0.48	0.23	0.5	121	10	301.4	3	0	0	70	1009	10
6	9	7	250	18	0.1	0.095	0.146	0.005	1124	67	-762	0.212	0.48	0.41	0.9	132	10	300.8	3	0	0	85	1009	7
6	9	7	250	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	126	10	300	3	0	0	85	1010	7
6	9	7	250	20	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	77	10	299.4	3	0	0	91	1010	0
6	9	7	250	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	93	10	298.9	3	0	0	82	1011	3
6	9	7	250	22	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	116	10	298.6	3	0	0	94	1012	3
6	9	7	250	23	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	298.2	3	0	0	97	1011	0
6	9	7	250	24	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.9	3	0	0	94	1010	3
6	9	8	251	1	-1	0.037	-9	-9	-999	17	4.8	0.687	0.8	1	0.5	141	10	297.5	3	0	0	100	1010	3
6	9	8	251	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	131	10	297.6	3	0	0	100	1009	3
6	9	8	251	3	-1.4	0.045	-9	-9	-999	22	5.8	0.687	0.8	1	0.6	143	10	297.9	3	0	0	94	1009	3
6	9	8	251	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	113	10	297.4	3	0	0	94	1010	3
6	9	8	251	5	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	138	10	297.8	3	0	0	100	1010	3
6	9	8	251	6	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	102	10	299.6	3	0	0	94	1010	3
6	9	8	251	7	-2.4	0.101	-9	-9	-999	74	38.9	0.687	0.8	0.45	1	142	10	302.5	3	0	0	94	1012	0
6	9	8	251	8	95.6	0.319	0.858	0.005	238	414	-30.6	0.687	0.8	0.24	1.7	166	10	303.9	3	0	0	80	1013	0
6	9	8	251	9	137.7	0.383	1.204	0.005	458	546	-37	0.687	0.8	0.19	2.1	198	10	303.4	3	0	0	75	1013	5
6	9	8	251	10	199.7	0.385	1.757	0.005	982	549	-25.7	0.687	0.8	0.18	2	178	10	304.9	3	0	0	66	1013	3
6	9	8	251	11	197.4	0.37	1.872	0.005	1202	518	-23.2	0.687	0.8	0.18	1.9	179	10	305.9	3	0	0	62	1012	7
6	9	8	251	12	210.4	0.4	2.019	0.006	1414	582	-27.4	0.687	0.8	0.18	2.1	190	10	306.8	3	0	0	62	1012	7
6	9	8	251	13	192.2	0.396	2.125	0.009	1803	574	-29.2	0.687	0.8	0.18	2.1	187	10	306.9	3	0	0	62	1010	8
6	9	8	251	14	135	0.357	1.894	0.009	1816	491	-30.3	0.687	0.8	0.18	1.9	178	10	306.9	3	0	0	60	1010	9
6	9	8	251	15	72.7	0.31	1.543	0.009	1823	399	-37	0.687	0.8	0.18	1.7	167	10	305.6	3	0	0	66	1010	10
6	9	8	251	16	39.1	0.281	1.256	0.008	1827	344	-51.4	0.687	0.8	0.19	1.6	140	10	304.9	3	0	0	66	1009	10
6	9	8	251	17	11.4	0.231	0.833	0.008	1828	257	-98.2	0.687	0.8	0.23	1.4	140	10	303.8	3	0	0	65	1010	10
6	9	8	251	18	0.1	0.136	0.172	0.008	1827	118	-2242.6	0.212	0.48	0.41	1.3	115	10	301.6	3	0	0	75	1010	3
6	9	8	251	19	-2.3	0.052	-9	-9	-999	31	5.6	0.212	0.48	1	1	95	10	300.4	3	0	0	85	1010	3
6	9	8	251	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	87	10	299.9	3	0	0	79	1011	0
6	9	8	251	21	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	118	10	299.4	3	0	0	82	1011	3
6	9	8	251	22	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	99	10	299.5	3	0	0	82	1012	3
6	9	8	251	23	-2.9	0.063	-9	-9	-999	36	7.6	0.562	0.7	1	0.9	66	10	298.5	3	0	0	85	1012	0
6	9	8	251	24	-3.6	0.069	-9	-9	-999	42	8.4	0.562	0.7	1	1	84	10	298.4	3	0	0	88	1011	0
6	9	9	252	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	100	10	298.4	3	0	0	82	1011	3
6	9	9	252	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	77	10	298.2	3	0	0	88	1011	0
6	9	9	252	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	43	10	297.5	3	0	0	88	1011	3
6	9	9	252	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	59	10	297.2	3	0	0	94	1011	3
6	9	9	252	5	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	95	10	297.2	3	0	0	97	1011	3
6	9	9	252	6	-1	0.037	-9	-9	-999	17	4.8	0.687	0.8	1	0.5	141	10	298.8	3	0	0	94	1011	3
6	9	9	252	7	-0.7	0.042	-9	-9	-999	19	9.4	0.212	0.48	0.45	0.8	125	10	302.4	3	0	0	88	1012	0
6	9	9	252	8	75.4	0.229	-9	-9	-999	252	-14.4	0.212	0.48	0.24	1.7	137	10	303.9	3	0	0	80	1013	0
6	9	9	252	9	105.3	0.237	-9	-9	-999	265	-11.4	0.212	0.48	0.19	1.7	130	10	304.9	3	0	0	75	1013	0
6	9	9	252	10	110.9	0.238	-9	-9	-999	267	-11	0.212	0.48	0.18	1.7	136	10	305.6	3	0	0	66	1013	8
6	9	9	252	11	149.1	0.265	-9	-9	-999	314	-11.3	0.212	0.48	0.18	1.9	137	10	306.6	3	0	0	64	1013	7
6	9	9	252	12	210.9	0.346	-9	-9	-999	469	-17.8	0.687	0.8	0.18	1.7	141	10	307.4	3	0	0	58	1012	7
6	9	9	252	13	118	0.259	-9	-9	-999	306	-13.3	0.212	0.48	0.18	1.9	139	10	306.9	3	0	0	56	1012	8
6	9	9	252	14	113.3	0.277	-9	-9	-999	335	-16.9	0.212	0.48	0.18	2.1	138	10	306.6	3	0	0	54	1010	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	9	252	15	81.6	0.259	-9	-9	-999	303	-19.2	0.212	0.48	0.18	2	133	10	306.1	3	0	0	56	1010	9
6	9	9	252	16	31.5	0.23	-9	-9	-999	255	-35	0.212	0.48	0.19	1.9	128	10	304.9	3	0	0	58	1010	10
6	9	9	252	17	9.5	0.185	-9	-9	-999	183	-59.9	0.212	0.48	0.23	1.6	120	10	303.4	3	0	0	63	1010	10
6	9	9	252	18	0.1	0.136	-9	-9	-999	115	-2243.3	0.212	0.48	0.41	1.3	108	10	301.2	3	0	0	70	1010	3
6	9	9	252	19	-3.4	0.067	-9	-9	-999	41	8.2	0.212	0.48	1	1.3	111	10	300	3	0	0	82	1010	7
6	9	9	252	20	-3.9	0.067	-9	-9	-999	40	7.1	0.212	0.48	1	1.3	115	10	299.1	3	0	0	79	1010	0
6	9	9	252	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	105	10	298.9	3	0	0	82	1011	7
6	9	9	252	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	298.9	3	0	0	82	1012	7
6	9	9	252	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	90	10	298.6	3	0	0	82	1011	7
6	9	9	252	24	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	110	10	298.5	3	0	0	82	1010	7
6	9	10	253	1	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	96	10	298.9	3	0	0	88	1010	7
6	9	10	253	2	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	98	10	298.6	3	0	0	88	1009	0
6	9	10	253	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	102	10	298.2	3	0	0	88	1009	7
6	9	10	253	4	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	109	10	298.2	3	0	0	88	1010	3
6	9	10	253	5	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	91	10	298.1	3	0	0	88	1010	0
6	9	10	253	6	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	104	10	299.9	3	0	0	88	1011	3
6	9	10	253	7	-1.1	0.056	-9	-9	-999	30	14.7	0.562	0.7	0.45	0.8	71	10	302.4	3	0	0	88	1012	0
6	9	10	253	8	68.6	0.188	-9	-9	-999	188	-8.8	0.212	0.48	0.24	1.3	110	10	303.9	3	0	0	80	1013	0
6	9	10	253	9	112.7	0.286	-9	-9	-999	352	-18.7	0.212	0.48	0.19	2.2	133	10	304.9	3	0	0	75	1013	0
6	9	10	253	10	104.9	0.256	-9	-9	-999	298	-14.5	0.212	0.48	0.18	1.9	132	10	305.4	3	0	0	66	1014	8
6	9	10	253	11	153.2	0.361	-9	-9	-999	499	-27.8	0.687	0.8	0.18	1.9	146	10	303.9	3	0	0	61	1013	8
6	9	10	253	12	186.4	0.408	-9	-9	-999	600	-33	0.687	0.8	0.18	2.2	164	10	304.4	3	0	0	54	1013	8
6	9	10	253	13	99	0.266	-9	-9	-999	328	-17.2	0.687	0.8	0.18	1.3	159	10	302	3	0	2.54	85	1012	9
6	9	10	253	14	145.8	0.332	-9	-9	-999	441	-22.7	0.687	0.8	0.18	1.7	144	10	305	3	0	0	59	1010	8
6	9	10	253	15	90.1	0.28	-9	-9	-999	342	-22	0.212	0.48	0.18	2.2	130	10	305.5	3	0	0	65	1010	8
6	9	10	253	16	35.6	0.223	-9	-9	-999	244	-28.2	0.212	0.48	0.19	1.8	122	10	304.4	3	0	0	58	1010	10
6	9	10	253	17	8	0.174	-9	-9	-999	167	-58.9	0.212	0.48	0.23	1.5	123	10	303.1	3	0	0	63	1010	10
6	9	10	253	18	0.1	0.105	-9	-9	-999	79	-1036.4	0.212	0.48	0.42	1	110	10	300.8	3	0	0	75	1010	3
6	9	10	253	19	-2.3	0.052	-9	-9	-999	28	5.6	0.212	0.48	1	1	108	10	299.9	3	0	0	79	1010	3
6	9	10	253	20	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	299.6	3	0	0	85	1011	3
6	9	10	253	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	299.4	3	0	0	82	1012	3
6	9	10	253	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	68	10	299.1	3	0	0	88	1012	3
6	9	10	253	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	64	10	298.5	3	0	0	94	1012	7
6	9	10	253	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	70	10	298.4	3	0	0	94	1012	3
6	9	11	254	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	88	10	298	3	0	0	94	1011	7
6	9	11	254	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	297.6	3	0	0	94	1010	3
6	9	11	254	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	57	10	297.2	3	0	0	100	1010	3
6	9	11	254	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.4	3	0	0	94	1010	7
6	9	11	254	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	77	10	297.5	3	0	0	97	1010	0
6	9	11	254	6	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	83	10	299	3	0	0	94	1010	7
6	9	11	254	7	-2.7	0.11	-9	-9	-999	84	44.8	0.562	0.7	0.45	1.1	80	10	301.4	3	0	0	94	1011	0
6	9	11	254	8	76.7	0.191	-9	-9	-999	192	-8.2	0.212	0.48	0.24	1.3	92	10	303.5	3	0	0	85	1012	0
6	9	11	254	9	95.4	0.185	-9	-9	-999	184	-6	0.212	0.48	0.19	1.2	86	10	304.5	3	0	0	82	1013	6
6	9	11	254	10	77.4	0.272	-9	-9	-999	327	-23.6	0.687	0.8	0.18	1.4	144	10	303.9	3	0	0.25	70	1013	9
6	9	11	254	11	24.2	0.218	-9	-9	-999	235	-38.7	0.687	0.8	0.18	1.2	152	10	299.9	3	0	0.25	88	1013	10
6	9	11	254	12	41.6	0.178	-9	-9	-999	174	-12.3	0.562	0.7	0.18	0.9	82	10	300	3	0	0	88	1012	10
6	9	11	254	13	93.7	0.223	-9	-9	-999	243	-10.7	0.562	0.7	0.18	1.1	38	10	301.8	3	0	0	85	1010	9
6	9	11	254	14	108.1	0.24	-9	-9	-999	271	-11.6	0.562	0.7	0.18	1.2	75	10	303.8	3	0	0	75	1010	9
6	9	11	254	15	56.7	0.204	-9	-9	-999	212	-13.5	0.212	0.48	0.18	1.5	95	10	304	3	0	0	75	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	11	254	16	18.6	0.175	-9	-9	-999	169	-25.9	0.212	0.48	0.19	1.4	98	10	302.8	3	0	0	65	1009	10
6	9	11	254	17	3.1	0.137	-9	-9	-999	116	-74.5	0.212	0.48	0.23	1.2	94	10	301.5	3	0	0	75	1009	10
6	9	11	254	18	0.1	0.14	-9	-9	-999	120	-2455.1	0.562	0.7	0.42	1	84	10	300	3	0	0.76	85	1009	7
6	9	11	254	19	-1.3	0.042	-9	-9	-999	28	5	0.212	0.48	1	0.8	93	10	299.1	3	0	0	82	1010	7
6	9	11	254	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	298.8	3	0	0	88	1010	7
6	9	11	254	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	298.6	3	0	0	88	1012	7
6	9	11	254	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	298.4	3	0	0	94	1012	7
6	9	11	254	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	85	10	298.4	3	0	0	94	1012	7
6	9	11	254	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	298.1	3	0	0	94	1011	7
6	9	12	255	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	63	10	297.8	3	0	0	94	1010	7
6	9	12	255	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	59	10	297.4	3	0	0	97	1009	7
6	9	12	255	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	82	10	297.1	3	0	0	100	1009	7
6	9	12	255	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	96	10	297.2	3	0	0	100	1009	7
6	9	12	255	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	297.4	3	0	0	97	1009	7
6	9	12	255	6	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	95	10	298.4	3	0	0	94	1010	7
6	9	12	255	7	-2	0.079	-9	-9	-999	51	22.3	0.212	0.48	0.45	1.2	89	10	301	3	0	0	94	1011	0
6	9	12	255	8	69.7	0.198	-9	-9	-999	203	-10.1	0.212	0.48	0.24	1.4	100	10	303.4	3	0	0	82	1012	0
6	9	12	255	9	97	0.215	-9	-9	-999	230	-9.3	0.212	0.48	0.19	1.5	100	10	304.6	3	0	0	70	1013	6
6	9	12	255	10	136	0.253	-9	-9	-999	292	-10.7	0.212	0.48	0.18	1.8	108	10	305.5	3	0	0	66	1013	6
6	9	12	255	11	129.5	0.232	-9	-9	-999	257	-8.7	0.212	0.48	0.18	1.6	108	10	306.2	3	0	0	64	1012	8
6	9	12	255	12	132.7	0.243	-9	-9	-999	275	-9.7	0.212	0.48	0.18	1.7	105	10	306.4	3	0	0	58	1011	8
6	9	12	255	13	77.1	0.239	-9	-9	-999	269	-16	0.212	0.48	0.18	1.8	113	10	305.6	3	0	0	62	1010	9
6	9	12	255	14	27	0.209	-9	-9	-999	220	-30.5	0.212	0.48	0.18	1.7	120	10	303.9	3	0	0	64	1010	10
6	9	12	255	15	14.2	0.19	-9	-9	-999	191	-43.5	0.212	0.48	0.18	1.6	114	10	302.2	3	0	0	66	1009	10
6	9	12	255	16	4.9	0.14	-9	-9	-999	121	-51.3	0.212	0.48	0.19	1.2	111	10	301.5	3	0	0	75	1009	10
6	9	12	255	17	0.1	0.095	-9	-9	-999	67	-761.8	0.212	0.48	0.23	0.9	110	10	301	3	0	0	80	1009	10
6	9	12	255	18	0.1	0.095	-9	-9	-999	67	-762.3	0.212	0.48	0.42	0.9	110	10	300.4	3	0	0	85	1010	7
6	9	12	255	19	-1	0.036	-9	-9	-999	17	4.4	0.212	0.48	1	0.7	103	10	299.9	3	0	0	85	1010	7
6	9	12	255	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	299.5	3	0	0	91	1010	7
6	9	12	255	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	299.4	3	0	0	88	1012	7
6	9	12	255	22	-0.8	0.035	-9	-9	-999	15	4.9	0.562	0.7	1	0.5	85	10	299.4	3	0	0	88	1012	7
6	9	12	255	23	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	117	10	299	3	0	0	94	1012	7
6	9	12	255	24	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	124	10	298.6	3	0	0	100	1011	7
6	9	13	256	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	139	10	298.5	3	0	0	94	1010	7
6	9	13	256	2	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	124	10	298.5	3	0	0	94	1010	7
6	9	13	256	3	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	105	10	298.4	3	0	0	94	1010	7
6	9	13	256	4	-1.7	0.052	-9	-9	-999	27	7.5	0.687	0.8	1	0.7	148	10	297.9	3	0	0	94	1010	7
6	9	13	256	5	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	153	10	298.2	3	0	0	97	1010	7
6	9	13	256	6	-4.2	0.082	-9	-9	-999	54	11.9	0.687	0.8	1	1.1	158	10	298.6	3	0	0.76	100	1011	7
6	9	13	256	7	-3.2	0.113	-9	-9	-999	88	41.4	0.687	0.8	0.45	1.1	172	10	299.8	3	0	0	94	1012	0
6	9	13	256	8	77.4	0.272	-9	-9	-999	327	-23.5	0.687	0.8	0.24	1.4	175	10	301.9	3	0	0	88	1013	0
6	9	13	256	9	125.7	0.38	-9	-9	-999	539	-39.5	0.687	0.8	0.19	2.1	202	10	303.2	3	0	0	80	1013	6
6	9	13	256	10	183.4	0.42	-9	-9	-999	627	-36.6	0.687	0.8	0.18	2.3	206	10	304.5	3	0	0	70	1013	6
6	9	13	256	11	104	0.273	-9	-9	-999	341	-17.7	0.24	0.3	0.16	2	254	10	304.9	3	0	0	66	1013	7
6	9	13	256	12	124.8	0.278	-9	-9	-999	337	-15.5	0.24	0.3	0.16	2	254	10	305.5	3	0	0	70	1013	6
6	9	13	256	13	65	0.223	-9	-9	-999	243	-15.3	0.24	0.3	0.16	1.6	258	10	304.1	3	0	0	79	1012	9
6	9	13	256	14	0.1	0.223	-9	-9	-999	242	-8888	0.562	0.7	0.18	1.6	47	10	297.5	3	0	54.86	100	1012	10
6	9	13	256	15	0.1	0.085	-9	-9	-999	72	-557.9	0.562	0.7	0.18	0.6	61	10	296.8	3	0	1.52	94	1011	10
6	9	13	256	16	0.1	0.084	-9	-9	-999	56	-819.3	0.212	0.48	0.19	0.8	98	10	297	3	0	0	100	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	13	256	17	0.1	0.095	-9	-9	-999	67	-762	0.212	0.48	0.24	0.9	103	10	297.2	3	0	0	97	1009	10
6	9	13	256	18	0.1	0.095	-9	-9	-999	67	-762.5	0.212	0.48	0.43	0.9	111	10	297.4	3	0	0	100	1010	7
6	9	13	256	19	-0.5	0.026	-9	-9	-999	13	3.1	0.212	0.48	1	0.5	120	10	297.4	3	0	0	100	1010	7
6	9	13	256	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	297.5	3	0	0	100	1010	7
6	9	13	256	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	74	10	297.8	3	0	0	100	1011	7
6	9	13	256	22	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	98	10	297.9	3	0	0	94	1012	7
6	9	13	256	23	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	122	10	297.9	3	0	0	97	1012	7
6	9	13	256	24	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	61	10	297.8	3	0	0	100	1012	7
6	9	14	257	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	59	10	297.6	3	0	0	100	1010	7
6	9	14	257	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	56	10	297.4	3	0	0	97	1010	7
6	9	14	257	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	297.2	3	0	0	100	1010	7
6	9	14	257	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	84	10	297.4	3	0	0	100	1011	7
6	9	14	257	5	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	92	10	297.6	3	0	0	100	1011	0
6	9	14	257	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	298.4	3	0	0	100	1012	3
6	9	14	257	7	-1.1	0.056	-9	-9	-999	30	13.8	0.562	0.7	0.45	0.8	85	10	300.4	3	0	0	94	1013	0
6	9	14	257	8	43.9	0.153	-9	-9	-999	137	-7.3	0.562	0.7	0.24	0.7	75	10	301.4	3	0	0	85	1014	9
6	9	14	257	9	100.7	0.176	-9	-9	-999	171	-4.9	0.212	0.48	0.19	1.1	111	10	303.4	3	0	0	94	1014	5
6	9	14	257	10	130	0.202	-9	-9	-999	209	-5.8	0.212	0.48	0.18	1.3	98	10	305.4	3	0	0	82	1014	6
6	9	14	257	11	99.1	0.276	-9	-9	-999	334	-19.2	0.562	0.7	0.18	1.5	72	10	301.4	3	0	15.49	85	1014	9
6	9	14	257	12	192	0.271	-9	-9	-999	325	-9.4	0.562	0.7	0.18	1.3	62	10	304.5	3	0	0	75	1012	7
6	9	14	257	13	88.7	0.252	-9	-9	-999	291	-16.2	0.212	0.48	0.18	1.9	98	10	305	3	0	0	70	1012	9
6	9	14	257	14	77.6	0.331	-9	-9	-999	438	-42.2	0.562	0.7	0.18	2	76	10	303.4	3	0	0	88	1011	10
6	9	14	257	15	33.1	0.194	-9	-9	-999	206	-19.8	0.212	0.48	0.18	1.5	100	10	301.1	3	0	0	88	1010	10
6	9	14	257	16	26.8	0.195	-9	-9	-999	198	-25	0.562	0.7	0.19	1.1	84	10	301.8	3	0	0	82	1010	10
6	9	14	257	17	3.4	0.179	-9	-9	-999	174	-151.8	0.562	0.7	0.24	1.2	85	10	300.6	3	0	0	80	1010	10
6	9	14	257	18	0.1	0.084	-9	-9	-999	60	-543.3	0.212	0.48	0.43	0.8	88	10	299.9	3	0	0	88	1010	7
6	9	14	257	19	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	299.4	3	0	0	88	1011	7
6	9	14	257	20	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	63	10	298.9	3	0	0	91	1011	0
6	9	14	257	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	298.6	3	0	0	88	1012	7
6	9	14	257	22	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	90	10	298.4	3	0	0	88	1012	7
6	9	14	257	23	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	102	10	298.4	3	0	0	94	1012	7
6	9	14	257	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	111	10	298.5	3	0	0	94	1011	7
6	9	15	258	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	106	10	298.6	3	0	1.02	100	1011	7
6	9	15	258	2	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	80	10	298.2	3	0	0	100	1010	0
6	9	15	258	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	68	10	297.8	3	0	0	100	1010	7
6	9	15	258	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	81	10	297.8	3	0	0	100	1010	7
6	9	15	258	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	297.8	3	0	0	97	1011	7
6	9	15	258	6	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	85	10	298.4	3	0	0	94	1011	7
6	9	15	258	7	-1.3	0.063	-9	-9	-999	36	16.6	0.562	0.7	0.45	0.9	80	10	301.4	3	0	0	100	1012	0
6	9	15	258	8	64.4	0.197	-9	-9	-999	201	-10.7	0.212	0.48	0.24	1.4	87	10	303.8	3	0	0	82	1013	0
6	9	15	258	9	70.6	0.189	-9	-9	-999	189	-8.7	0.212	0.48	0.19	1.3	91	10	304.4	3	0	0	75	1013	8
6	9	15	258	10	119.3	0.269	-9	-9	-999	321	-14.7	0.212	0.48	0.18	2	96	10	304.6	3	0	0	66	1013	7
6	9	15	258	11	142.7	0.293	-9	-9	-999	364	-15.9	0.212	0.48	0.18	2.2	91	10	305.9	3	0	0	61	1012	7
6	9	15	258	12	135.6	0.3	-9	-9	-999	378	-18	0.212	0.48	0.18	2.3	100	10	306.2	3	0	0	58	1012	8
6	9	15	258	13	128.2	0.28	-9	-9	-999	341	-15.5	0.212	0.48	0.18	2.1	96	10	306.4	3	0	0	60	1010	8
6	9	15	258	14	111.4	0.305	-9	-9	-999	386	-22.8	0.212	0.48	0.18	2.4	88	10	305.9	3	0	0	56	1009	8
6	9	15	258	15	75.1	0.276	-9	-9	-999	334	-25.2	0.212	0.48	0.18	2.2	100	10	305.2	3	0	0	58	1009	9
6	9	15	258	16	42.8	0.264	-9	-9	-999	312	-38.7	0.212	0.48	0.19	2.2	100	10	304.4	3	0	0	61	1009	9
6	9	15	258	17	5	0.188	-9	-9	-999	189	-120.2	0.212	0.48	0.24	1.7	92	10	302.8	3	0	0	65	1010	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	15	258	18	0.1	0.115	-9	-9	-999	91	-1370.3	0.212	0.48	0.44	1.1	101	10	301.2	3	0	0	75	1010	3
6	9	15	258	19	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	84	10	300.5	3	0	0	79	1011	3
6	9	15	258	20	-2.8	0.063	-9	-9	-999	36	7.8	0.562	0.7	1	0.9	71	10	299.9	3	0	0	88	1011	3
6	9	15	258	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	69	10	299.2	3	0	0	82	1012	3
6	9	15	258	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	67	10	298.9	3	0	0	999	1012	3
6	9	15	258	23	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.8	83	10	298.6	3	0	0	999	1012	99
6	9	15	258	24	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	67	10	298.4	3	0	0	999	1011	99
6	9	16	259	1	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	60	10	298.2	3	0	0	999	1010	99
6	9	16	259	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	82	10	298	3	0	0	97	1010	3
6	9	16	259	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	85	10	297.9	3	0	0	88	1010	3
6	9	16	259	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	93	10	298	3	0	0	88	1010	3
6	9	16	259	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	76	10	297.9	3	0	0	88	1011	3
6	9	16	259	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	298.4	3	0	0	94	1012	7
6	9	16	259	7	-2.5	0.12	-9	-9	-999	96	63.5	0.562	0.7	0.45	1.1	84	10	301.9	3	0	0	77	1012	0
6	9	16	259	8	64.4	0.226	-9	-9	-999	247	-16.1	0.212	0.48	0.24	1.7	104	10	303.6	3	0	0	77	1012	0
6	9	16	259	9	91	0.262	-9	-9	-999	308	-17.8	0.212	0.48	0.19	2	102	10	304.2	3	0	0	70	1013	7
6	9	16	259	10	125.4	0.298	-9	-9	-999	374	-19.1	0.212	0.48	0.18	2.3	98	10	305.1	3	0	0	61	1012	6
6	9	16	259	11	163.5	0.334	-9	-9	-999	444	-20.6	0.212	0.48	0.18	2.6	110	10	305.9	3	0	0	60	1012	5
6	9	16	259	12	135.5	0.329	-9	-9	-999	433	-23.6	0.212	0.48	0.18	2.6	108	10	306.1	3	0	0	58	1011	8
6	9	16	259	13	147.4	0.312	-9	-9	-999	401	-18.6	0.212	0.48	0.18	2.4	111	10	306.2	3	0	0	58	1010	7
6	9	16	259	14	106.9	0.285	-9	-9	-999	350	-19.4	0.212	0.48	0.18	2.2	110	10	305.8	3	0	0	54	1009	8
6	9	16	259	15	84.1	0.279	-9	-9	-999	338	-23.1	0.212	0.48	0.18	2.2	101	10	305.4	3	0	0	56	1008	9
6	9	16	259	16	41.4	0.254	-9	-9	-999	295	-35.7	0.212	0.48	0.19	2.1	102	10	304.2	3	0	0	999	1008	10
6	9	16	259	17	7.7	0.183	-9	-9	-999	181	-71.2	0.212	0.48	0.24	1.6	101	10	302.6	3	0	0	999	1008	10
6	9	16	259	18	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	0.44	0.9	100	10	301	3	0	0	999	1009	99
6	9	16	259	19	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.9	94	10	300.2	3	0	0	999	1009	99
6	9	16	259	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	97	10	299.8	3	0	0	82	1010	7
6	9	16	259	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	299.1	3	0	0	88	1011	7
6	9	16	259	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	81	10	298.9	3	0	0	82	1011	7
6	9	16	259	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	298.8	3	0	0	88	1011	7
6	9	16	259	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	298.4	3	0	0	90	1010	7
6	9	17	260	1	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	88	10	298	3	0	0	92	1010	99
6	9	17	260	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	104	10	297.9	3	0	0	94	1009	7
6	9	17	260	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	118	10	298.4	3	0	0	100	1009	7
6	9	17	260	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	104	10	298.1	3	0	0	100	1009	7
6	9	17	260	5	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	103	10	298	3	0	0	97	1010	7
6	9	17	260	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	298.9	3	0	0	89	1010	7
6	9	17	260	7	-1.4	0.071	-9	-9	-999	43	22.7	0.562	0.7	0.45	0.9	82	10	301.9	3	0	0	82	1011	0
6	9	17	260	8	61.5	0.186	-9	-9	-999	185	-9.5	0.212	0.48	0.24	1.3	92	10	303.4	3	0	0	75	1012	0
6	9	17	260	9	104.1	0.217	-9	-9	-999	232	-8.9	0.212	0.48	0.19	1.5	95	10	304.6	3	0	0	70	1012	4
6	9	17	260	10	140.6	0.254	-9	-9	-999	294	-10.5	0.212	0.48	0.18	1.8	103	10	305.9	3	0	0	65	1012	5
6	9	17	260	11	149	0.255	-9	-9	-999	297	-10.1	0.212	0.48	0.18	1.8	112	10	306.5	3	0	0	61	1011	7
6	9	17	260	12	129.9	0.271	-9	-9	-999	325	-13.8	0.212	0.48	0.18	2	116	10	306.9	3	0	0	56	1010	8
6	9	17	260	13	140.3	0.273	-9	-9	-999	329	-13.1	0.212	0.48	0.18	2	107	10	306.6	3	0	0	56	1009	8
6	9	17	260	14	117.5	0.278	-9	-9	-999	337	-16.4	0.212	0.48	0.18	2.1	113	10	306.1	3	0	0	56	1008	8
6	9	17	260	15	72.1	0.275	-9	-9	-999	332	-26	0.212	0.48	0.18	2.2	112	10	305.1	3	0	0	56	1008	9
6	9	17	260	16	17.3	0.221	-9	-9	-999	239	-56	0.212	0.48	0.19	1.9	115	10	303	3	0	0	66	1008	10
6	9	17	260	17	1.7	0.152	-9	-9	-999	137	-186.5	0.212	0.48	0.24	1.4	109	10	301.6	3	0	0	65	1009	10
6	9	17	260	18	0.1	0.095	-9	-9	-999	67	-762	0.212	0.48	0.44	0.9	106	10	300.4	3	0	0	79	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	17	260	19	-1.6	0.047	-9	-9	-999	24	5.6	0.212	0.48	1	0.9	104	10	299.9	3	0	0	80	1010	7
6	9	17	260	20	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.8	108	10	299.8	3	0	0	81	1011	99
6	9	17	260	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	299.6	3	0	0	82	1012	7
6	9	17	260	22	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	83	10	299.5	3	0	0	86	1012	7
6	9	17	260	23	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	87	10	298.9	3	0	0	90	1012	99
6	9	17	260	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	298.6	3	0	0	94	1011	7
6	9	18	261	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	298.5	3	0	0	94	1010	7
6	9	18	261	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	66	10	298.5	3	0	0	94	1010	3
6	9	18	261	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	298.2	3	0	0	94	1010	3
6	9	18	261	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	61	10	298.1	3	0	0	94	1010	7
6	9	18	261	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	58	10	297.9	3	0	0	97	1011	7
6	9	18	261	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	64	10	298.6	3	0	0	94	1012	3
6	9	18	261	7	-1.5	0.08	-9	-9	-999	52	30.2	0.212	0.48	0.45	1.1	111	10	302.1	3	0	0	88	1013	0
6	9	18	261	8	70	0.227	-9	-9	-999	250	-15.2	0.212	0.48	0.24	1.7	127	10	303.9	3	0	0	82	1013	0
6	9	18	261	9	105.8	0.275	-9	-9	-999	331	-17.7	0.212	0.48	0.19	2.1	132	10	304.9	3	0	0	75	1013	4
6	9	18	261	10	111	0.248	-9	-9	-999	284	-12.4	0.212	0.48	0.18	1.8	139	10	305.9	3	0	0	70	1013	7
6	9	18	261	11	112.7	0.267	-9	-9	-999	318	-15.3	0.212	0.48	0.18	2	128	10	305.5	3	0	0	64	1013	8
6	9	18	261	12	89.4	0.299	-9	-9	-999	376	-27	0.212	0.48	0.18	2.4	139	10	306.4	3	0	0	60	1012	9
6	9	18	261	13	129.9	0.299	-9	-9	-999	376	-18.6	0.212	0.48	0.18	2.3	132	10	306.9	3	0	0	60	1011	8
6	9	18	261	14	104.2	0.274	-9	-9	-999	331	-17.9	0.212	0.48	0.18	2.1	119	10	306.4	3	0	0	60	1010	8
6	9	18	261	15	78.3	0.277	-9	-9	-999	335	-24.4	0.212	0.48	0.18	2.2	121	10	305.6	3	0	0	60	1010	9
6	9	18	261	16	43.1	0.236	-9	-9	-999	265	-27.6	0.212	0.48	0.19	1.9	118	10	304.9	3	0	0	61	1010	9
6	9	18	261	17	5.1	0.188	-9	-9	-999	189	-117.9	0.212	0.48	0.24	1.7	119	10	303	3	0	0	70	1010	10
6	9	18	261	18	0.1	0.125	-9	-9	-999	103	-1771.7	0.212	0.48	0.45	1.2	116	10	301.4	3	0	0	75	1011	7
6	9	18	261	19	-1.3	0.042	-9	-9	-999	24	5	0.212	0.48	1	0.8	98	10	300.4	3	0	0	85	1012	7
6	9	18	261	20	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	300.1	3	0	0	88	1013	3
6	9	18	261	21	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	88	10	299.9	3	0	0	94	1013	3
6	9	18	261	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	299.4	3	0	0	88	1013	3
6	9	18	261	23	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	298.9	3	0	0	94	1013	3
6	9	18	261	24	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	69	10	298.6	3	0	0	88	1013	3
6	9	19	262	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	298.4	3	0	0	88	1012	3
6	9	19	262	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	87	10	298.2	3	0	0	94	1012	0
6	9	19	262	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	298	3	0	0	94	1012	3
6	9	19	262	4	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	297.9	3	0	0	94	1012	3
6	9	19	262	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	83	10	297.9	3	0	0	97	1012	0
6	9	19	262	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	299.2	3	0	0	100	1013	3
6	9	19	262	7	-1.1	0.06	-9	-9	-999	34	17.7	0.212	0.48	0.45	1	92	10	302.2	3	0	0	88	1014	0
6	9	19	262	8	72.8	0.199	-9	-9	-999	205	-9.8	0.212	0.48	0.24	1.4	109	10	303.8	3	0	0	77	1015	0
6	9	19	262	9	109.8	0.228	-9	-9	-999	250	-9.8	0.212	0.48	0.19	1.6	121	10	305	3	0	0	70	1015	0
6	9	19	262	10	137.7	0.224	-9	-9	-999	244	-7.4	0.212	0.48	0.18	1.5	131	10	305.9	3	0	0	61	1015	5
6	9	19	262	11	131	0.223	-9	-9	-999	242	-7.6	0.212	0.48	0.18	1.5	120	10	306.4	3	0	0	58	1014	7
6	9	19	262	12	89.4	0.223	-9	-9	-999	243	-11.2	0.212	0.48	0.18	1.6	120	10	306.4	3	0	0	56	1013	9
6	9	19	262	13	134.6	0.253	-9	-9	-999	292	-10.8	0.212	0.48	0.18	1.8	134	10	307.1	3	0	0	54	1012	8
6	9	19	262	14	98.6	0.236	-9	-9	-999	263	-11.9	0.212	0.48	0.18	1.7	124	10	306.9	3	0	0	54	1011	9
6	9	19	262	15	74.2	0.247	-9	-9	-999	283	-18.4	0.212	0.48	0.18	1.9	130	10	306.4	3	0	0	56	1011	9
6	9	19	262	16	19.5	0.185	-9	-9	-999	184	-29.4	0.212	0.48	0.19	1.5	119	10	304.5	3	0	0	58	1010	10
6	9	19	262	17	0.8	0.149	-9	-9	-999	132	-369.6	0.212	0.48	0.24	1.4	112	10	302.8	3	0	0	65	1011	10
6	9	19	262	18	0.1	0.105	-9	-9	-999	78	-1037	0.212	0.48	0.45	1	108	10	300.9	3	0	0	75	1011	7
6	9	19	262	19	-1.6	0.047	-9	-9	-999	24	5.6	0.212	0.48	1	0.9	100	10	300.1	3	0	0	82	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	19	262	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	104	10	299.5	3	0	0	82	1012	0
6	9	19	262	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	91	10	299	3	0	0	88	1013	7
6	9	19	262	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	74	10	298.6	3	0	0	94	1013	7
6	9	19	262	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	69	10	298.1	3	0	0	88	1013	7
6	9	19	262	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	298	3	0	0	88	1012	7
6	9	20	263	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	298.2	3	0	0	94	1012	7
6	9	20	263	2	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	110	10	298	3	0	0	97	1011	0
6	9	20	263	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	102	10	297.8	3	0	0	94	1011	7
6	9	20	263	4	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	105	10	297.6	3	0	0	94	1011	7
6	9	20	263	5	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	95	10	297.9	3	0	0	100	1012	7
6	9	20	263	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	104	10	299.4	3	0	0	100	1013	3
6	9	20	263	7	-1.5	0.084	-9	-9	-999	56	35.5	0.562	0.7	0.44	0.9	82	10	302.1	3	0	0	88	1013	0
6	9	20	263	8	82.7	0.172	-9	-9	-999	164	-5.6	0.212	0.48	0.24	1.1	105	10	304.1	3	0	0	77	1013	0
6	9	20	263	9	118.7	0.211	-9	-9	-999	222	-7.1	0.212	0.48	0.19	1.4	122	10	305.2	3	0	0	66	1014	0
6	9	20	263	10	132.1	0.161	-9	-9	-999	149	-2.8	0.212	0.48	0.18	0.9	133	10	306.4	3	0	0	66	1013	6
6	9	20	263	11	139.1	0.287	-9	-9	-999	353	-15.3	0.562	0.7	0.18	1.5	338	10	304.9	3	0	0	60	1013	8
6	9	20	263	12	23.7	0.194	-9	-9	-999	199	-27.6	0.24	0.3	0.16	1.5	303	10	303.4	3	0	1.78	60	1012	10
6	9	20	263	13	32.1	0.196	-9	-9	-999	200	-21.1	0.674	0.73	0.17	1	240	10	298.2	3	0	30.23	60	1012	10
6	9	20	263	14	128	0.232	-9	-9	-999	257	-8.8	0.562	0.7	0.18	1.1	357	10	302.2	3	0	0	64	1010	9
6	9	20	263	15	69.2	0.241	-9	-9	-999	272	-18.3	0.562	0.7	0.18	1.3	11	10	302.4	3	0	0	82	1010	10
6	9	20	263	16	31	0.21	-9	-9	-999	222	-27.1	0.562	0.7	0.19	1.2	24	10	302.5	3	0	0	85	1009	10
6	9	20	263	17	5.8	0.147	-9	-9	-999	130	-49.3	0.562	0.7	0.24	0.9	37	10	301.9	3	0	0	72	1010	10
6	9	20	263	18	0.1	0.074	-9	-9	-999	48	-371.8	0.212	0.48	0.46	0.7	86	10	300.8	3	0	0	85	1010	7
6	9	20	263	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	102	10	300	3	0	0	85	1011	7
6	9	20	263	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	104	10	299.5	3	0	0	85	1012	0
6	9	20	263	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	106	10	299.1	3	0	0	88	1013	7
6	9	20	263	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	90	10	298.8	3	0	0	94	1013	7
6	9	20	263	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	70	10	298.4	3	0	0	94	1013	0
6	9	20	263	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	112	10	298.2	3	0	0	94	1012	7
6	9	21	264	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	67	10	297.5	3	0	0	94	1011	3
6	9	21	264	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	90	10	297.4	3	0	0	94	1010	3
6	9	21	264	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	86	10	297.4	3	0	0	94	1010	3
6	9	21	264	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	75	10	297	3	0	0	94	1010	3
6	9	21	264	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	296.9	3	0	0	97	1011	3
6	9	21	264	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	99	10	298.2	3	0	0	94	1012	7
6	9	21	264	7	-1.1	0.058	-9	-9	-999	32	16.4	0.212	0.48	0.44	1	109	10	301.9	3	0	0	94	1013	0
6	9	21	264	8	77	0.21	-9	-9	-999	222	-10.9	0.212	0.48	0.24	1.5	108	10	303.8	3	0	0	79	1013	0
6	9	21	264	9	107	0.247	-9	-9	-999	282	-12.7	0.212	0.48	0.19	1.8	113	10	304.8	3	0	0	75	1013	3
6	9	21	264	10	124.2	0.241	-9	-9	-999	272	-10.2	0.212	0.48	0.18	1.7	124	10	305.4	3	0	0	62	1013	7
6	9	21	264	11	163.7	0.277	-9	-9	-999	336	-11.7	0.212	0.48	0.18	2	133	10	306.4	3	0	0	58	1012	5
6	9	21	264	12	89.5	0.243	-9	-9	-999	275	-14.4	0.212	0.48	0.18	1.8	119	10	306.4	3	0	0	62	1011	9
6	9	21	264	13	135.7	0.31	-9	-9	-999	397	-19.7	0.212	0.48	0.18	2.4	122	10	306.4	3	0	0	62	1010	8
6	9	21	264	14	92.3	0.205	-9	-9	-999	218	-8.4	0.212	0.48	0.18	1.4	117	10	306.2	3	0	0	60	1010	9
6	9	21	264	15	37.8	0.177	-9	-9	-999	171	-13.1	0.562	0.7	0.18	0.9	349	10	303.8	3	0	0	56	1009	10
6	9	21	264	16	15	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.19	0	0	10	303.1	3	0	0	58	1009	10
6	9	21	264	17	0.1	0.146	-9	-9	-999	128	-2792.8	0.212	0.48	0.24	1.4	118	10	302.2	3	0	0	70	1010	10
6	9	21	264	18	0.1	0.105	-9	-9	-999	78	-1036.4	0.212	0.48	0.46	1	112	10	301	3	0	0	75	1010	7
6	9	21	264	19	-1	0.036	-9	-9	-999	18	4.4	0.212	0.48	1	0.7	95	10	300.5	3	0	0	85	1011	7
6	9	21	264	20	-0.8	0.035	-9	-9	-999	15	4.9	0.562	0.7	1	0.5	54	10	300.1	3	0	0	85	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	21	264	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	55	10	299.6	3	0	0	88	1012	7
6	9	21	264	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	78	10	299.2	3	0	0	88	1012	7
6	9	21	264	23	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	100	10	298.6	3	0	0	94	1012	0
6	9	21	264	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298.4	3	0	0	94	1012	7
6	9	22	265	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	89	10	298.2	3	0	0	94	1011	7
6	9	22	265	2	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	97	10	298.2	3	0	0	97	1010	0
6	9	22	265	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	298	3	0	0	94	1010	7
6	9	22	265	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.6	3	0	0	94	1011	3
6	9	22	265	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	95	10	297.6	3	0	0	97	1011	0
6	9	22	265	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	113	10	297.9	3	0	0	100	1012	3
6	9	22	265	7	-1.1	0.052	-9	-9	-999	27	11.8	0.212	0.48	0.44	1	107	10	300.1	3	0	0	94	1012	0
6	9	22	265	8	78.2	0.181	-9	-9	-999	178	-6.9	0.212	0.48	0.24	1.2	104	10	303.5	3	0	0	88	1013	0
6	9	22	265	9	104.2	0.208	-9	-9	-999	217	-7.7	0.212	0.48	0.19	1.4	107	10	304.6	3	0	0	75	1013	5
6	9	22	265	10	133	0.243	-9	-9	-999	275	-9.7	0.212	0.48	0.18	1.7	113	10	305.4	3	0	0	66	1013	6
6	9	22	265	11	148.8	0.255	-9	-9	-999	297	-10.1	0.212	0.48	0.18	1.8	110	10	306.2	3	0	0	54	1012	7
6	9	22	265	12	107.5	0.257	-9	-9	-999	299	-14.2	0.212	0.48	0.18	1.9	108	10	306.8	3	0	0	54	1011	9
6	9	22	265	13	131.5	0.252	-9	-9	-999	291	-11	0.212	0.48	0.18	1.8	106	10	306.9	3	0	0	50	1010	8
6	9	22	265	14	115	0.22	-9	-9	-999	237	-8.3	0.212	0.48	0.18	1.5	104	10	306.9	3	0	0	56	1009	8
6	9	22	265	15	14	0.124	-9	-9	-999	104	-12.3	0.212	0.48	0.18	0.9	110	10	304.9	3	0	0	52	1009	10
6	9	22	265	16	11.7	0.169	-9	-9	-999	160	-37	0.212	0.48	0.19	1.4	115	10	303.6	3	0	0	52	1009	10
6	9	22	265	17	4.9	0.178	-9	-9	-999	173	-104.7	0.212	0.48	0.24	1.6	110	10	302.6	3	0	0	61	1009	10
6	9	22	265	18	0.1	0.146	-9	-9	-999	128	-2792.8	0.212	0.48	0.47	1.4	117	10	300.9	3	0	0	70	1010	7
6	9	22	265	19	-2.4	0.057	-9	-9	-999	35	6.9	0.212	0.48	1	1.1	88	10	300.4	3	0	0	74	1010	7
6	9	22	265	20	-2.3	0.056	-9	-9	-999	30	6.8	0.562	0.7	1	0.8	76	10	300	3	0	0	77	1010	0
6	9	22	265	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	299.4	3	0	0	77	1011	7
6	9	22	265	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	298.8	3	0	0	77	1011	7
6	9	22	265	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	121	10	298.5	3	0	0	82	1011	7
6	9	22	265	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	298.5	3	0	0	88	1010	7
6	9	23	266	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	92	10	298.4	3	0	0	94	1010	7
6	9	23	266	2	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	68	10	298.2	3	0	0	94	1009	0
6	9	23	266	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	298	3	0	0	94	1009	3
6	9	23	266	4	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	297.9	3	0	0	100	1009	3
6	9	23	266	5	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	102	10	297.8	3	0	0	97	1009	3
6	9	23	266	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	97	10	299.9	3	0	0	94	1010	7
6	9	23	266	7	-0.7	0.047	-9	-9	-999	23	12.6	0.212	0.48	0.44	0.9	108	10	302.5	3	0	0	94	1011	0
6	9	23	266	8	78.6	0.171	-9	-9	-999	163	-5.8	0.212	0.48	0.24	1.1	90	10	304.4	3	0	0	77	1012	0
6	9	23	266	9	112.9	0.219	-9	-9	-999	236	-8.4	0.212	0.48	0.19	1.5	106	10	305.2	3	0	0	70	1012	0
6	9	23	266	10	125.9	0.181	-9	-9	-999	178	-4.3	0.212	0.48	0.18	1.1	108	10	306.1	3	0	0	62	1012	6
6	9	23	266	11	78.6	0.179	-9	-9	-999	174	-6.5	0.562	0.7	0.18	0.8	339	10	304.9	3	0	0	58	1011	10
6	9	23	266	12	17.9	0.16	-9	-9	-999	148	-20.7	0.24	0.3	0.16	1.2	274	10	302.2	3	0	10.41	56	1010	10
6	9	23	266	13	1.7	0.137	-9	-9	-999	116	-138.5	0.24	0.3	0.16	1.2	322	10	298.5	3	0	3.81	60	1010	10
6	9	23	266	14	6.1	0.135	-9	-9	-999	114	-36	0.562	0.7	0.18	0.8	81	10	297.6	3	0	3.05	77	1009	10
6	9	23	266	15	21.2	0.166	-9	-9	-999	155	-19.2	0.562	0.7	0.18	0.9	78	10	297.6	3	0	0	94	1008	10
6	9	23	266	16	13.6	0.158	-9	-9	-999	145	-26.3	0.562	0.7	0.19	0.9	57	10	298	3	0	0	94	1008	10
6	9	23	266	17	0.1	0.095	-9	-9	-999	68	-761.3	0.212	0.48	0.25	0.9	86	10	297.6	3	0	0	88	1008	10
6	9	23	266	18	0.1	0.14	-9	-9	-999	120	-2454.3	0.562	0.7	0.47	1	80	10	297.6	3	0	0	94	1009	7
6	9	23	266	19	-3.1	0.069	-9	-9	-999	43	9.7	0.562	0.7	1	1	85	10	297.9	3	0	0	94	1010	7
6	9	23	266	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	297.9	3	0	0	100	1010	7
6	9	23	266	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	297.9	3	0	0	94	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	23	266	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	84	10	297.9	3	0	0	94	1011	7
6	9	23	266	23	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	93	10	298	3	0	0	97	1011	0
6	9	23	266	24	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	87	10	297.6	3	0	0	94	1010	7
6	9	24	267	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	80	10	297.6	3	0	0	100	1010	3
6	9	24	267	2	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	297.2	3	0	0	97	1009	3
6	9	24	267	3	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.9	3	0	0	100	1009	3
6	9	24	267	4	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	296.9	3	0	0	100	1009	3
6	9	24	267	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297	3	0	0.25	100	1010	3
6	9	24	267	6	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	299.6	3	0	0	100	1011	7
6	9	24	267	7	-0.5	0.042	-9	-9	-999	19	12.1	0.212	0.48	0.44	0.8	110	10	303.1	3	0	0	94	1011	0
6	9	24	267	8	84	0.251	-9	-9	-999	289	-16.9	0.212	0.48	0.24	1.9	130	10	304	3	0	0	80	1012	0
6	9	24	267	9	124.5	0.27	-9	-9	-999	323	-14.3	0.212	0.48	0.19	2	132	10	305	3	0	0	80	1012	0
6	9	24	267	10	130.3	0.252	-9	-9	-999	291	-11	0.212	0.48	0.18	1.8	129	10	305.9	3	0	0	66	1012	6
6	9	24	267	11	108.4	0.237	-9	-9	-999	266	-11.1	0.212	0.48	0.18	1.7	116	10	305.9	3	0	0	68	1011	8
6	9	24	267	12	132.2	0.33	-9	-9	-999	435	-24.4	0.687	0.8	0.18	1.7	152	10	305.9	3	0	0	66	1010	9
6	9	24	267	13	98.1	0.245	-9	-9	-999	282	-13.5	0.212	0.48	0.18	1.8	135	10	305.9	3	0	0	60	1009	9
6	9	24	267	14	86.3	0.251	-9	-9	-999	290	-16.5	0.212	0.48	0.18	1.9	125	10	306.2	3	0	0	58	1008	9
6	9	24	267	15	75.3	0.257	-9	-9	-999	300	-20.3	0.212	0.48	0.18	2	120	10	305.8	3	0	0	62	1008	9
6	9	24	267	16	32.7	0.231	-9	-9	-999	256	-34	0.212	0.48	0.19	1.9	114	10	304.6	3	0	0	58	1008	10
6	9	24	267	17	3.5	0.166	-9	-9	-999	157	-117	0.212	0.48	0.25	1.5	118	10	302.8	3	0	0	68	1009	10
6	9	24	267	18	-1.5	0.083	-9	-9	-999	57	34.3	0.212	0.48	0.48	1.1	108	10	300.8	3	0	0	75	1009	3
6	9	24	267	19	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	106	10	300	3	0	0	82	1010	3
6	9	24	267	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	299.4	3	0	0	88	1010	0
6	9	24	267	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	80	10	298.9	3	0	0	82	1011	3
6	9	24	267	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	298.8	3	0	0	88	1011	3
6	9	24	267	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	44	10	298.2	3	0	0	88	1011	3
6	9	24	267	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	30	10	297.9	3	0	0	88	1011	3
6	9	25	268	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	41	10	297.8	3	0	0	94	1010	3
6	9	25	268	2	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	62	10	297.5	3	0	0	97	1010	0
6	9	25	268	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	92	10	297.4	3	0	0	94	1010	3
6	9	25	268	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	74	10	297.4	3	0	0	100	1011	3
6	9	25	268	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	297.4	3	0	0	97	1011	7
6	9	25	268	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	80	10	299.2	3	0	0	100	1012	3
6	9	25	268	7	-0.8	0.051	-9	-9	-999	27	15.7	0.212	0.48	0.44	0.9	102	10	302.6	3	0	0	94	1013	0
6	9	25	268	8	66	0.178	-9	-9	-999	173	-7.7	0.212	0.48	0.24	1.2	110	10	303.9	3	0	0	88	1013	0
6	9	25	268	9	114.3	0.239	-9	-9	-999	268	-10.8	0.212	0.48	0.19	1.7	131	10	305.2	3	0	0	75	1014	0
6	9	25	268	10	109.1	0.228	-9	-9	-999	250	-9.8	0.212	0.48	0.18	1.6	112	10	305	3	0	0	65	1013	8
6	9	25	268	11	64.7	0.199	-9	-9	-999	205	-11.1	0.687	0.8	0.18	0.9	141	10	302.6	3	0	0.76	66	1013	10
6	9	25	268	12	20.2	0.202	-9	-9	-999	209	-36.8	0.562	0.7	0.18	1.2	2	10	299.2	3	0	0	61	1013	10
6	9	25	268	13	40.4	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	301.2	3	0	0	75	1012	10
6	9	25	268	14	40.7	0.216	-9	-9	-999	230	-22.3	0.687	0.8	0.18	1.1	152	10	300.1	3	0	0.25	70	1011	10
6	9	25	268	15	66.3	0.148	-9	-9	-999	132	-4.4	0.212	0.48	0.18	0.9	118	10	302.6	3	0	0	75	1010	9
6	9	25	268	16	48.2	0.191	-9	-9	-999	193	-13.1	0.212	0.48	0.19	1.4	106	10	303.8	3	0	0	80	1010	9
6	9	25	268	17	6	0.152	-9	-9	-999	136	-52.4	0.212	0.48	0.25	1.3	107	10	302.2	3	0	0	77	1010	10
6	9	25	268	18	0.1	0.105	-9	-9	-999	78	-1036.4	0.212	0.48	0.48	1	86	10	300.6	3	0	0	85	1010	7
6	9	25	268	19	-2	0.052	-9	-9	-999	28	6.3	0.212	0.48	1	1	97	10	299.8	3	0	0	88	1011	7
6	9	25	268	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	89	10	299.2	3	0	0	88	1012	0
6	9	25	268	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	298.9	3	0	0	88	1012	7
6	9	25	268	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	85	10	298.8	3	0	0	94	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	25	268	23	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	105	10	298.6	3	0	0	94	1012	0
6	9	25	268	24	-1.5	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	298.5	3	0	0	100	1012	3
6	9	26	269	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	92	10	298.4	3	0	0	94	1012	3
6	9	26	269	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	298	3	0	0	91	1011	7
6	9	26	269	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	78	10	297.8	3	0	0	94	1011	3
6	9	26	269	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	71	10	297.6	3	0	0	100	1011	3
6	9	26	269	5	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	297.8	3	0	0	94	1012	3
6	9	26	269	6	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	86	10	299.4	3	0	0	100	1012	3
6	9	26	269	7	-2.1	0.129	-9	-9	-999	107	93.6	0.562	0.7	0.44	1.1	75	10	302.1	3	0	0	94	1013	0
6	9	26	269	8	79.6	0.211	-9	-9	-999	223	-10.7	0.212	0.48	0.24	1.5	93	10	303.4	3	0	0	85	1014	0
6	9	26	269	9	115.6	0.229	-9	-9	-999	252	-9.4	0.212	0.48	0.19	1.6	113	10	304.9	3	0	0	75	1014	0
6	9	26	269	10	134.6	0.263	-9	-9	-999	309	-12.2	0.212	0.48	0.18	1.9	115	10	305.8	3	0	0	70	1014	6
6	9	26	269	11	138	0.301	-9	-9	-999	379	-17.8	0.212	0.48	0.18	2.3	122	10	305.5	3	0	0	70	1013	7
6	9	26	269	12	101	0.274	-9	-9	-999	330	-18.3	0.212	0.48	0.18	2.1	114	10	305.6	3	0	0	70	1012	9
6	9	26	269	13	126	0.314	-9	-9	-999	405	-22.2	0.687	0.8	0.18	1.6	153	10	305.6	3	0	0	62	1011	9
6	9	26	269	14	4.5	0.076	-9	-9	-999	140	-8.7	0.24	0.3	0.16	0.5	283	10	300.9	3	0	1.52	85	1012	10
6	9	26	269	15	0.9	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	298.8	3	0	4.83	88	1012	10
6	9	26	269	16	0.5	0.197	-9	-9	-999	200	-1247.5	0.562	0.7	0.19	1.4	75	10	298	3	0	4.06	88	1011	10
6	9	26	269	17	0.1	0.115	-9	-9	-999	91	-1370.7	0.212	0.48	0.25	1.1	102	10	298	3	0	0.25	97	1011	10
6	9	26	269	18	-0.2	0.078	-9	-9	-999	51	218.6	0.212	0.48	0.49	0.8	93	10	297.9	3	0	0	94	1011	7
6	9	26	269	19	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	297.9	3	0	0	94	1012	7
6	9	26	269	20	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	83	10	297.9	3	0	0	94	1012	7
6	9	26	269	21	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	77	10	297.8	3	0	0	94	1012	7
6	9	26	269	22	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	82	10	297.5	3	0	0	94	1012	7
6	9	26	269	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	99	10	297.4	3	0	0	97	1012	7
6	9	26	269	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	101	10	297.4	3	0	0	100	1011	7
6	9	27	270	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	89	10	297.6	3	0	0	100	1011	7
6	9	27	270	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	69	10	297.4	3	0	0	100	1010	7
6	9	27	270	3	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	83	10	297.4	3	0	0	100	1010	7
6	9	27	270	4	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	60	10	297.2	3	0	0	100	1010	7
6	9	27	270	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	87	10	297.2	3	0	0	100	1011	0
6	9	27	270	6	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	86	10	299.2	3	0	0	100	1011	3
6	9	27	270	7	-1	0.064	-9	-9	-999	37	23.2	0.562	0.7	0.44	0.8	64	10	302.1	3	0	0	88	1012	0
6	9	27	270	8	57	0.165	-9	-9	-999	155	-7.2	0.212	0.48	0.24	1.1	102	10	303.8	3	0	0	80	1013	4
6	9	27	270	9	104.2	0.227	-9	-9	-999	248	-10.1	0.212	0.48	0.19	1.6	118	10	304.5	3	0	0	80	1014	5
6	9	27	270	10	142	0.254	-9	-9	-999	294	-10.4	0.212	0.48	0.18	1.8	121	10	305.8	3	0	0	75	1014	5
6	9	27	270	11	103.1	0.256	-9	-9	-999	297	-14.6	0.212	0.48	0.18	1.9	115	10	304.2	3	0	0	70	1014	8
6	9	27	270	12	33.8	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	301.9	3	0	0	82	1013	10
6	9	27	270	13	36.8	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	300.9	3	0	0	80	1012	10
6	9	27	270	14	31.6	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	300.9	3	0	0	97	1011	10
6	9	27	270	15	11.3	0.205	-9	-9	-999	213	-68.4	0.687	0.8	0.18	1.2	180	10	298.9	3	0	0	85	1011	10
6	9	27	270	16	6.6	0.134	-9	-9	-999	114	-33.2	0.212	0.48	0.19	1.1	105	10	298.8	3	0	1.02	85	1010	10
6	9	27	270	17	0.6	0.129	-9	-9	-999	107	-344.8	0.562	0.7	0.25	0.9	84	10	298.9	3	0	0	74	1010	10
6	9	27	270	18	-0.5	0.118	-9	-9	-999	93	275.4	0.562	0.7	0.49	0.9	74	10	298.4	3	0	0	88	1010	7
6	9	27	270	19	-1.6	0.047	-9	-9	-999	25	5.6	0.212	0.48	1	0.9	90	10	298.2	3	0	0	94	1011	7
6	9	27	270	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	101	10	297.9	3	0	0	91	1011	7
6	9	27	270	21	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	96	10	298	3	0	0	94	1011	7
6	9	27	270	22	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	68	10	297.9	3	0	0	94	1011	7
6	9	27	270	23	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	89	10	297.6	3	0	0	91	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	27	270	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	75	10	297.5	3	0	0	94	1010	7
6	9	28	271	1	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	103	10	297.5	3	0	0	94	1010	7
6	9	28	271	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	111	10	297.5	3	0	0	97	1009	7
6	9	28	271	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	83	10	297.4	3	0	0	94	1009	7
6	9	28	271	4	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	101	10	298	3	0	0	100	1010	7
6	9	28	271	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	298	3	0	0	100	1010	7
6	9	28	271	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	299.4	3	0	0	94	1011	7
6	9	28	271	7	-1.1	0.079	-9	-9	-999	51	42.3	0.212	0.48	0.44	1	111	10	302.9	3	0	0	94	1012	0
6	9	28	271	8	75.7	0.22	-9	-9	-999	237	-12.7	0.212	0.48	0.24	1.6	134	10	303.9	3	0	0	88	1013	0
6	9	28	271	9	95.4	0.235	-9	-9	-999	261	-12.2	0.212	0.48	0.19	1.7	135	10	304.4	3	0	0	79	1013	6
6	9	28	271	10	196.1	0.356	-9	-9	-999	490	-20.9	0.687	0.8	0.18	1.8	150	10	306	3	0	0	70	1013	0
6	9	28	271	11	62.2	0.346	-9	-9	-999	468	-60.1	0.687	0.8	0.18	2	176	10	302	3	0	2.54	75	1013	10
6	9	28	271	12	30.6	0.21	-9	-9	-999	231	-27.2	0.687	0.8	0.18	1.1	194	10	300.4	3	0	0.25	91	1011	10
6	9	28	271	13	51.7	0.17	-9	-9	-999	161	-8.6	0.562	0.7	0.18	0.8	67	10	301.2	3	0	0.51	85	1010	10
6	9	28	271	14	103	0.187	-9	-9	-999	186	-5.7	0.212	0.48	0.18	1.2	96	10	304	3	0	0	94	1009	8
6	9	28	271	15	65.7	0.245	-9	-9	-999	279	-20.1	0.212	0.48	0.18	1.9	106	10	304.4	3	0	0	80	1009	9
6	9	28	271	16	35.1	0.223	-9	-9	-999	242	-28.5	0.212	0.48	0.19	1.8	110	10	303.8	3	0	0	66	1009	10
6	9	28	271	17	0.2	0.136	-9	-9	-999	118	-1050.9	0.212	0.48	0.25	1.3	109	10	301.5	3	0	0	70	1009	10
6	9	28	271	18	-0.2	0.112	-9	-9	-999	87	841	0.212	0.48	0.5	1.1	109	10	300	3	0	0	79	1010	7
6	9	28	271	19	-1.3	0.042	-9	-9	-999	22	5	0.212	0.48	1	0.8	92	10	299.4	3	0	0	88	1010	7
6	9	28	271	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	90	10	299	3	0	0	91	1010	7
6	9	28	271	21	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	57	10	298.5	3	0	0	94	1011	3
6	9	28	271	22	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	61	10	298.1	3	0	0	88	1011	3
6	9	28	271	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	76	10	298.1	3	0	0	91	1011	0
6	9	28	271	24	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	106	10	298	3	0	0	94	1010	3
6	9	29	272	1	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	297.9	3	0	0	94	1010	3
6	9	29	272	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	97	10	298.1	3	0	0	94	1009	3
6	9	29	272	3	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	67	10	297.4	3	0	0	100	1009	3
6	9	29	272	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	84	10	297.2	3	0	0	100	1009	3
6	9	29	272	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	57	10	297.1	3	0	0	100	1010	3
6	9	29	272	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	61	10	298.6	3	0	0	100	1010	3
6	9	29	272	7	-0.6	0.042	-9	-9	-999	19	11.6	0.212	0.48	0.44	0.8	86	10	302.2	3	0	0	94	1012	0
6	9	29	272	8	58.9	0.185	-9	-9	-999	183	-9.7	0.212	0.48	0.24	1.3	112	10	303.5	3	0	0	85	1013	0
6	9	29	272	9	104.2	0.227	-9	-9	-999	248	-10.1	0.212	0.48	0.19	1.6	113	10	304.9	3	0	0.25	75	1013	4
6	9	29	272	10	143.3	0.254	-9	-9	-999	295	-10.4	0.212	0.48	0.18	1.8	109	10	306	3	0	0	66	1013	0
6	9	29	272	11	148.7	0.265	-9	-9	-999	314	-11.3	0.212	0.48	0.18	1.9	95	10	306.1	3	0	0	58	1012	6
6	9	29	272	12	106.8	0.218	-9	-9	-999	234	-8.7	0.212	0.48	0.18	1.5	107	10	305.4	3	0	0.25	66	1012	9
6	9	29	272	13	15.2	0.153	-9	-9	-999	139	-21.4	0.212	0.48	0.18	1.2	122	10	301.1	3	0	15.49	62	1011	10
6	9	29	272	14	19.4	0.108	-9	-9	-999	82	-5.9	0.212	0.48	0.18	0.7	132	10	300.4	3	0	0.25	62	1009	10
6	9	29	272	15	30	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	301.4	3	0	0	65	1009	10
6	9	29	272	16	32.4	0.174	-9	-9	-999	166	-14.5	0.562	0.7	0.19	0.9	63	10	302	3	0	0	79	1009	10
6	9	29	272	17	5.2	0.183	-9	-9	-999	180	-105.7	0.562	0.7	0.25	1.2	75	10	301	3	0	0	79	1009	10
6	9	29	272	18	-1	0.144	-9	-9	-999	126	275.1	0.562	0.7	0.5	1.1	75	10	299.8	3	0	0	82	1010	7
6	9	29	272	19	-2	0.056	-9	-9	-999	34	7.8	0.562	0.7	1	0.8	83	10	298.9	3	0	0	82	1010	7
6	9	29	272	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	298.5	3	0	0	88	1010	7
6	9	29	272	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	76	10	298.4	3	0	0	88	1010	7
6	9	29	272	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	89	10	298	3	0	0	88	1010	7
6	9	29	272	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	56	10	297.9	3	0	0	100	1010	7
6	9	29	272	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	104	10	297.9	3	0	0	100	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	9	30	273	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	104	10	297.8	3	0	0	94	1009	7
6	9	30	273	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	297.9	3	0	0	94	1009	7
6	9	30	273	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	108	10	297.8	3	0	0	100	1009	7
6	9	30	273	4	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	122	10	297.9	3	0	0	100	1009	7
6	9	30	273	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	120	10	297.9	3	0	0	100	1009	7
6	9	30	273	6	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	147	10	298.5	3	0	0	100	1010	7
6	9	30	273	7	-1.5	0.084	-9	-9	-999	56	35.5	0.212	0.48	0.44	1.1	135	10	301	3	0	0	94	1011	0
6	9	30	273	8	53	0.221	-9	-9	-999	239	-18.5	0.212	0.48	0.24	1.7	130	10	302.8	3	0	0	88	1012	0
6	9	30	273	9	120.5	0.326	-9	-9	-999	429	-26	0.687	0.8	0.19	1.7	142	10	304.1	3	0	0	80	1013	7
6	9	30	273	10	165.4	0.323	-9	-9	-999	422	-18.4	0.687	0.8	0.18	1.6	153	10	304.9	3	0	0	80	1013	7
6	9	30	273	11	129.4	0.252	-9	-9	-999	292	-11.1	0.212	0.48	0.18	1.8	128	10	306.1	3	0	0	85	1012	7
6	9	30	273	12	105.1	0.309	-9	-9	-999	394	-25.2	0.687	0.8	0.18	1.6	142	10	305	3	0	4.06	62	1011	9
6	9	30	273	13	24.9	0.122	-9	-9	-999	130	-6.6	0.687	0.8	0.18	0.5	152	10	301.1	3	0	1.78	64	1010	10
6	9	30	273	14	65.4	0.188	-9	-9	-999	188	-9.2	0.562	0.7	0.18	0.9	28	10	302	3	0	0	70	1009	10
6	9	30	273	15	53.6	0.231	-9	-9	-999	255	-20.7	0.212	0.48	0.18	1.8	102	10	303.9	3	0	0	75	1009	10
6	9	30	273	16	26	0.199	-9	-9	-999	205	-27.4	0.212	0.48	0.2	1.6	106	10	303	3	0	0	75	1009	10
6	9	30	273	17	0.2	0.115	-9	-9	-999	92	-852.5	0.212	0.48	0.25	1.1	102	10	301.4	3	0	0	70	1009	10
6	9	30	273	18	-0.7	0.097	-9	-9	-999	70	121.2	0.562	0.7	0.51	0.8	85	10	300.5	3	0	0	85	1010	7
6	9	30	273	19	-1.3	0.042	-9	-9	-999	20	5	0.212	0.48	1	0.8	101	10	299.9	3	0	0	88	1010	7
6	9	30	273	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	100	10	299.4	3	0	0	88	1011	7
6	9	30	273	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	299.2	3	0	0	94	1011	7
6	9	30	273	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	96	10	299.1	3	0	0	94	1011	7
6	9	30	273	23	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	70	10	298.6	3	0	0	94	1011	7
6	9	30	273	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	45	10	298.1	3	0	0	94	1010	7
6	10	1	274	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	85	10	297.9	3	0	0	94	1010	7
6	10	1	274	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	56	10	297.6	3	0	0	94	1009	7
6	10	1	274	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	297.5	3	0	0	94	1009	7
6	10	1	274	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	73	10	297.5	3	0	0	94	1009	3
6	10	1	274	5	-999	-9	-9	-9	-999	-999	-99999	0.475	0.6	1	0	0	10	297.2	3	0	0	94	1009	3
6	10	1	274	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	55	10	298.4	3	0	0	100	1010	3
6	10	1	274	7	-0.6	0.049	-9	-9	-999	25	16	0.562	0.7	0.44	0.7	72	10	302.2	3	0	0	94	1011	0
6	10	1	274	8	77.1	0.22	-9	-9	-999	238	-12.5	0.212	0.48	0.24	1.6	115	10	303.9	3	0	0	80	1013	0
6	10	1	274	9	80.9	0.24	-9	-9	-999	271	-15.5	0.212	0.48	0.19	1.8	122	10	304.5	3	0	0	75	1013	8
6	10	1	274	10	134.6	0.253	-9	-9	-999	292	-10.8	0.212	0.48	0.18	1.8	130	10	305.8	3	0	0	70	1013	6
6	10	1	274	11	150.4	0.246	-9	-9	-999	280	-8.9	0.212	0.48	0.18	1.7	123	10	306.4	3	0	0	58	1012	6
6	10	1	274	12	125.5	0.261	-9	-9	-999	306	-12.7	0.212	0.48	0.18	1.9	124	10	307	3	0	0	62	1012	8
6	10	1	274	13	67	0.255	-9	-9	-999	295	-22.2	0.212	0.48	0.18	2	116	10	306.1	3	0	0	60	1011	10
6	10	1	274	14	49.8	0.23	-9	-9	-999	253	-21.9	0.212	0.48	0.18	1.8	114	10	304.8	3	0	0	56	1010	10
6	10	1	274	15	31.1	0.23	-9	-9	-999	254	-35.3	0.212	0.48	0.18	1.9	113	10	303.5	3	0	0	58	1009	10
6	10	1	274	16	6.5	0.172	-9	-9	-999	164	-69.5	0.212	0.48	0.2	1.5	112	10	302.1	3	0	0	70	1009	10
6	10	1	274	17	0.1	0.105	-9	-9	-999	79	-1035	0.212	0.48	0.25	1	111	10	300.9	3	0	0	75	1009	10
6	10	1	274	18	-1	0.082	-9	-9	-999	54	48.9	0.212	0.48	0.51	1	108	10	300.2	3	0	0	85	1009	7
6	10	1	274	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	109	10	299.8	3	0	0	88	1010	7
6	10	1	274	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	101	10	299.4	3	0	0	94	1010	7
6	10	1	274	21	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	97	10	299.2	3	0	0	88	1011	7
6	10	1	274	22	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	41	10	298.8	3	0	0	88	1011	7
6	10	1	274	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	44	10	298	3	0	0	88	1011	7
6	10	1	274	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	297.9	3	0	0	88	1010	7
6	10	2	275	1	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	94	10	298	3	0	0	94	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	2	275	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	65	10	297.5	3	0	0	94	1009	7
6	10	2	275	3	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	297.5	3	0	0	82	1009	7
6	10	2	275	4	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	82	10	297.4	3	0	0	94	1009	7
6	10	2	275	5	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	86	10	297.2	3	0	0	94	1010	7
6	10	2	275	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	101	10	297.5	3	0	0	94	1010	7
6	10	2	275	7	-0.7	0.042	-9	-9	-999	19	9.8	0.212	0.48	0.44	0.8	89	10	299.6	3	0	0	94	1011	0
6	10	2	275	8	76.7	0.181	-9	-9	-999	177	-7	0.212	0.48	0.24	1.2	112	10	303.1	3	0	0	82	1012	0
6	10	2	275	9	119.9	0.25	-9	-9	-999	287	-11.7	0.212	0.48	0.19	1.8	124	10	304.6	3	0	0	75	1012	0
6	10	2	275	10	141.9	0.235	-9	-9	-999	262	-8.2	0.212	0.48	0.18	1.6	127	10	305.8	3	0	0	70	1012	4
6	10	2	275	11	150.2	0.246	-9	-9	-999	280	-8.9	0.212	0.48	0.18	1.7	127	10	306.1	3	0	0	62	1012	6
6	10	2	275	12	105.8	0.237	-9	-9	-999	265	-11.3	0.212	0.48	0.18	1.7	126	10	306.2	3	0	0	62	1011	9
6	10	2	275	13	57.8	0.242	-9	-9	-999	274	-22.1	0.212	0.48	0.18	1.9	131	10	305.8	3	0	0	58	1010	10
6	10	2	275	14	105.3	0.294	-9	-9	-999	366	-21.6	0.212	0.48	0.18	2.3	129	10	305.8	3	0	0	55	1009	8
6	10	2	275	15	78.2	0.258	-9	-9	-999	302	-19.8	0.212	0.48	0.18	2	128	10	305.6	3	0	0	52	1009	9
6	10	2	275	16	26.4	0.218	-9	-9	-999	235	-35.3	0.212	0.48	0.2	1.8	123	10	304	3	0	0	61	1008	10
6	10	2	275	17	1.8	0.162	-9	-9	-999	151	-209.7	0.212	0.48	0.26	1.5	111	10	302.1	3	0	0	63	1009	10
6	10	2	275	18	-1.5	0.052	-9	-9	-999	38	8.2	0.212	0.48	0.52	1	106	10	300.4	3	0	0	74	1009	3
6	10	2	275	19	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	92	10	299.9	3	0	0	77	1009	3
6	10	2	275	20	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	299.4	3	0	0	85	1010	0
6	10	2	275	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	81	10	298.9	3	0	0	88	1010	7
6	10	2	275	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	298.5	3	0	0	94	1010	7
6	10	2	275	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	42	10	297.8	3	0	0	94	1009	7
6	10	2	275	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	49	10	297.4	3	0	0	100	1009	7
6	10	3	276	1	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	79	10	297.4	3	0	0	94	1008	7
6	10	3	276	2	-0.6	0.026	-9	-9	-999	10	2.7	0.212	0.48	1	0.5	98	10	296.9	3	0	0	97	1008	0
6	10	3	276	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	56	10	296.9	3	0	0	94	1008	3
6	10	3	276	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	69	10	296.6	3	0	0	94	1008	3
6	10	3	276	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	61	10	296.6	3	0	0	97	1008	0
6	10	3	276	6	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	61	10	298.2	3	0	0	94	1009	3
6	10	3	276	7	-0.6	0.049	-9	-9	-999	25	16.1	0.562	0.7	0.44	0.7	74	10	302.2	3	0	0	88	1010	0
6	10	3	276	8	81.1	0.231	-9	-9	-999	255	-13.7	0.212	0.48	0.24	1.7	122	10	303.8	3	0	0	82	1011	0
6	10	3	276	9	121.5	0.279	-9	-9	-999	339	-16.1	0.212	0.48	0.19	2.1	132	10	304.9	3	0	0	75	1012	0
6	10	3	276	10	144.7	0.284	-9	-9	-999	347	-14.2	0.212	0.48	0.18	2.1	129	10	305.9	3	0	0	66	1012	0
6	10	3	276	11	148.9	0.275	-9	-9	-999	332	-12.6	0.212	0.48	0.18	2	126	10	306.5	3	0	0	58	1011	6
6	10	3	276	12	158.3	0.257	-9	-9	-999	300	-9.7	0.212	0.48	0.18	1.8	124	10	307.1	3	0	0	58	1010	6
6	10	3	276	13	69	0.255	-9	-9	-999	297	-21.7	0.212	0.48	0.18	2	131	10	307.1	3	0	0	75	1010	10
6	10	3	276	14	98.3	0.264	-9	-9	-999	312	-16.8	0.212	0.48	0.18	2	117	10	306.4	3	0	0	49	1009	9
6	10	3	276	15	79.9	0.268	-9	-9	-999	319	-21.7	0.212	0.48	0.18	2.1	120	10	306	3	0	0	54	1008	9
6	10	3	276	16	38.4	0.243	-9	-9	-999	276	-33.8	0.212	0.48	0.2	2	113	10	304.5	3	0	0	59	1008	10
6	10	3	276	17	1.8	0.152	-9	-9	-999	139	-178.7	0.212	0.48	0.26	1.4	109	10	302	3	0	0	63	1009	10
6	10	3	276	18	-1.9	0.057	-9	-9	-999	37	8.7	0.212	0.48	0.52	1.1	108	10	300.4	3	0	0	79	1009	3
6	10	3	276	19	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	96	10	299.8	3	0	0	82	1009	3
6	10	3	276	20	-2.8	0.057	-9	-9	-999	31	6	0.212	0.48	1	1.1	110	10	298.9	3	0	0	85	1010	0
6	10	3	276	21	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	110	10	298.4	3	0	0	88	1010	7
6	10	3	276	22	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	97	10	298.2	3	0	0	94	1010	7
6	10	3	276	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	60	10	297.8	3	0	0	94	1009	0
6	10	3	276	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	71	10	297.5	3	0	0	88	1009	7
6	10	4	277	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	84	10	297.9	3	0	0	94	1008	3
6	10	4	277	2	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	96	10	297.8	3	0	0	97	1007	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	4	277	3	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	297.5	3	0	0	94	1007	3
6	10	4	277	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	62	10	297.2	3	0	0	94	1007	3
6	10	4	277	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	297.2	3	0	0	97	1008	7
6	10	4	277	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	79	10	298.8	3	0	0	94	1008	3
6	10	4	277	7	-0.8	0.054	-9	-9	-999	29	17.7	0.212	0.48	0.44	0.9	109	10	302.1	3	0	0	94	1009	0
6	10	4	277	8	70.2	0.228	-9	-9	-999	250	-15.1	0.212	0.48	0.24	1.7	109	10	303.9	3	0	0	85	1010	0
6	10	4	277	9	102.9	0.246	-9	-9	-999	281	-13.1	0.212	0.48	0.19	1.8	104	10	305	3	0	0	75	1011	5
6	10	4	277	10	107.7	0.257	-9	-9	-999	299	-14.2	0.212	0.48	0.18	1.9	112	10	305.2	3	0	0	70	1011	8
6	10	4	277	11	106.9	0.266	-9	-9	-999	316	-15.9	0.212	0.48	0.18	2	112	10	305.9	3	0	0	66	1010	8
6	10	4	277	12	137.2	0.282	-9	-9	-999	345	-14.7	0.212	0.48	0.18	2.1	107	10	306.4	3	0	0	85	1009	8
6	10	4	277	13	67.1	0.264	-9	-9	-999	312	-24.7	0.212	0.48	0.18	2.1	107	10	306.4	3	0	0	66	1008	10
6	10	4	277	14	53.1	0.24	-9	-9	-999	271	-23.5	0.212	0.48	0.18	1.9	109	10	305.4	3	0	0	60	1008	10
6	10	4	277	15	25.3	0.189	-9	-9	-999	190	-24	0.212	0.48	0.18	1.5	110	10	303.9	3	0	0	70	1008	10
6	10	4	277	16	17.2	0.193	-9	-9	-999	195	-37.5	0.212	0.48	0.2	1.6	104	10	303	3	0	0	75	1008	10
6	10	4	277	17	0.4	0.147	-9	-9	-999	130	-772.7	0.212	0.48	0.26	1.4	101	10	301.9	3	0	0	72	1008	10
6	10	4	277	18	-2	0.057	-9	-9	-999	36	8.5	0.212	0.48	0.53	1.1	97	10	300.6	3	0	0	79	1008	3
6	10	4	277	19	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	95	10	299.9	3	0	0	88	1008	3
6	10	4	277	20	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	81	10	299.4	3	0	0	94	1009	3
6	10	4	277	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	86	10	298.9	3	0	0	94	1009	3
6	10	4	277	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	75	10	298.6	3	0	0	88	1009	3
6	10	4	277	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	58	10	298.2	3	0	0	88	1009	3
6	10	4	277	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	55	10	298.1	3	0	0	88	1008	3
6	10	5	278	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	63	10	298	3	0	0	94	1007	7
6	10	5	278	2	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	56	10	297.9	3	0	0	97	1007	0
6	10	5	278	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	95	10	297.9	3	0	0	94	1007	3
6	10	5	278	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	85	10	297.8	3	0	0	94	1007	3
6	10	5	278	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	297.8	3	0	0	100	1008	7
6	10	5	278	6	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	88	10	299.2	3	0	0	94	1008	3
6	10	5	278	7	-2.5	0.137	-9	-9	-999	116	93.9	0.212	0.48	0.44	1.5	95	10	300.9	3	0	0	88	1009	0
6	10	5	278	8	50.9	0.192	-9	-9	-999	194	-12.6	0.212	0.48	0.24	1.4	106	10	301.9	3	0	0	88	1011	6
6	10	5	278	9	21.6	0.215	-9	-9	-999	229	-41.3	0.212	0.48	0.19	1.8	126	10	299.6	3	0	1.27	80	1012	10
6	10	5	278	10	20.1	0.204	-9	-9	-999	212	-38.3	0.212	0.48	0.18	1.7	114	10	298.6	3	0	1.02	91	1011	10
6	10	5	278	11	55	0.25	-9	-9	-999	288	-25.7	0.212	0.48	0.18	2	119	10	300	3	0	0	75	1010	10
6	10	5	278	12	117.1	0.268	-9	-9	-999	320	-14.9	0.212	0.48	0.18	2	126	10	302.1	3	0	0	82	1009	8
6	10	5	278	13	80.3	0.249	-9	-9	-999	286	-17.3	0.212	0.48	0.18	1.9	106	10	303.2	3	0	0	80	1008	9
6	10	5	278	14	50.4	0.267	-9	-9	-999	318	-34.1	0.212	0.48	0.18	2.2	110	10	302.9	3	0	0	75	1008	10
6	10	5	278	15	69.9	0.256	-9	-9	-999	297	-21.5	0.212	0.48	0.18	2	112	10	303.9	3	0	0	70	1007	9
6	10	5	278	16	17	0.211	-9	-9	-999	224	-49.8	0.212	0.48	0.2	1.8	110	10	302.6	3	0	0	70	1008	10
6	10	5	278	17	0.1	0.125	-9	-9	-999	104	-3476.1	0.212	0.48	0.26	1.2	105	10	301.2	3	0	0	75	1008	10
6	10	5	278	18	-2.5	0.085	-9	-9	-999	57	22.1	0.212	0.48	0.53	1.3	116	10	299	3	0	2.29	94	1009	7
6	10	5	278	19	-3.5	0.075	-9	-9	-999	47	10.8	0.687	0.8	1	1	148	10	297.9	3	0	16	88	1010	7
6	10	5	278	20	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	87	10	297.2	3	0	2.79	94	1010	7
6	10	5	278	21	-2.8	0.063	-9	-9	-999	36	7.7	0.562	0.7	1	0.9	85	10	297.4	3	0	0.51	100	1010	3
6	10	5	278	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	57	10	297.5	3	0	0	94	1010	7
6	10	5	278	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	43	10	297.4	3	0	1.27	97	1010	7
6	10	5	278	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	71	10	297.4	3	0	1.52	100	1009	7
6	10	6	279	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	65	10	297.5	3	0	0	100	1008	7
6	10	6	279	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	56	10	297.4	3	0	0	100	1008	7
6	10	6	279	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	66	10	297.4	3	0	0	100	1008	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	6	279	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	58	10	297.1	3	0	0	94	1008	7
6	10	6	279	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	80	10	297.2	3	0	0	97	1009	7
6	10	6	279	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	88	10	298.5	3	0	0	94	1010	7
6	10	6	279	7	-1.6	0.102	-9	-9	-999	75	58.1	0.212	0.48	0.44	1.2	100	10	301.8	3	0	0	88	1011	0
6	10	6	279	8	60.3	0.233	-9	-9	-999	259	-19	0.212	0.48	0.24	1.8	110	10	303.6	3	0	0	88	1012	0
6	10	6	279	9	105.4	0.303	-9	-9	-999	384	-23.8	0.212	0.48	0.19	2.4	117	10	304.6	3	0	0	80	1013	3
6	10	6	279	10	126.9	0.308	-9	-9	-999	393	-20.8	0.212	0.48	0.18	2.4	110	10	305.1	3	0	0	75	1012	6
6	10	6	279	11	134.9	0.282	-9	-9	-999	344	-14.9	0.212	0.48	0.18	2.1	106	10	305.4	3	0	0	88	1012	7
6	10	6	279	12	139.4	0.283	-9	-9	-999	345	-14.6	0.212	0.48	0.18	2.1	108	10	305.1	3	0	0	70	1010	7
6	10	6	279	13	73.9	0.257	-9	-9	-999	300	-20.6	0.212	0.48	0.18	2	112	10	305.2	3	0	0	75	1009	9
6	10	6	279	14	99.4	0.264	-9	-9	-999	312	-16.7	0.212	0.48	0.18	2	112	10	305.6	3	0	0	66	1009	9
6	10	6	279	15	66	0.254	-9	-9	-999	295	-22.4	0.212	0.48	0.18	2	117	10	305.1	3	0	0	62	1008	9
6	10	6	279	16	38.2	0.225	-9	-9	-999	245	-26.7	0.212	0.48	0.2	1.8	108	10	304.4	3	0	0	66	1008	10
6	10	6	279	17	0.1	0.146	-9	-9	-999	130	-2790.9	0.212	0.48	0.26	1.4	112	10	302.2	3	0	0	72	1009	10
6	10	6	279	18	-1.4	0.057	-9	-9	-999	36	12	0.212	0.48	0.54	1.1	102	10	300.9	3	0	0	85	1009	7
6	10	6	279	19	-2.5	0.063	-9	-9	-999	36	8.8	0.562	0.7	1	0.9	83	10	300.4	3	0	0	86	1010	7
6	10	6	279	20	-2.7	0.057	-9	-9	-999	31	6.1	0.212	0.48	1	1.1	98	10	299.9	3	0	0	88	1010	3
6	10	6	279	21	-4.3	0.076	-9	-9	-999	49	9.3	0.562	0.7	1	1.1	82	10	299.5	3	0	0	88	1011	0
6	10	6	279	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	93	10	299.2	3	0	0	94	1011	3
6	10	6	279	23	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	104	10	298.9	3	0	0	97	1010	3
6	10	6	279	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	298.9	3	0	0	94	1010	7
6	10	7	280	1	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	298.6	3	0	0	100	1010	7
6	10	7	280	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	64	10	298.4	3	0	0	100	1010	7
6	10	7	280	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	67	10	298	3	0	0	94	1010	7
6	10	7	280	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	298.1	3	0	0	100	1010	7
6	10	7	280	5	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	82	10	298.5	3	0	0	97	1010	7
6	10	7	280	6	-5.2	0.083	-9	-9	-999	55	10	0.212	0.48	1	1.6	86	10	298.4	3	0	0	100	1011	7
6	10	7	280	7	3.7	0.192	-9	-9	-999	194	-171.8	0.562	0.7	0.44	1.3	78	10	297.9	3	0	0.51	94	1012	6
6	10	7	280	8	48	0.22	-9	-9	-999	237	-19.9	0.562	0.7	0.24	1.2	66	10	299.5	3	0	0	97	1012	8
6	10	7	280	9	91.5	0.236	-9	-9	-999	264	-13	0.562	0.7	0.19	1.2	75	10	301	3	0	0.25	88	1013	8
6	10	7	280	10	103.8	0.265	-9	-9	-999	314	-16.2	0.212	0.48	0.18	2	86	10	303.4	3	0	0	75	1012	8
6	10	7	280	11	51	0.277	-9	-9	-999	335	-37.6	0.212	0.48	0.18	2.3	106	10	301	3	0	0.76	91	1012	10
6	10	7	280	12	25.8	0.189	-9	-9	-999	192	-23.8	0.212	0.48	0.18	1.5	108	10	297.6	3	0	1.78	94	1011	10
6	10	7	280	13	41.3	0.179	-9	-9	-999	174	-12.5	0.212	0.48	0.18	1.3	122	10	299.1	3	0	0	100	1010	10
6	10	7	280	14	26.2	0.236	-9	-9	-999	264	-45.4	0.212	0.48	0.18	2	107	10	298.9	3	0	0	88	1010	10
6	10	7	280	15	13.8	0.171	-9	-9	-999	164	-32.6	0.212	0.48	0.18	1.4	122	10	297.9	3	0	0.25	94	1009	10
6	10	7	280	16	10.6	0.139	-9	-9	-999	120	-23	0.212	0.48	0.2	1.1	101	10	298	3	0	0.25	100	1009	10
6	10	7	280	17	0.1	0.14	-9	-9	-999	120	-2455.1	0.562	0.7	0.26	1	81	10	297.8	3	0	0	94	1009	10
6	10	7	280	18	-1.1	0.049	-9	-9	-999	30	9.8	0.562	0.7	0.54	0.7	75	10	297.6	3	0	0	94	1010	7
6	10	7	280	19	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	75	10	297.5	3	0	0	94	1010	7
6	10	7	280	20	-0.9	0.035	-9	-9	-999	15	4.2	0.562	0.7	1	0.5	81	10	297.5	3	0	0	97	1011	0
6	10	7	280	21	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	106	10	297.6	3	0	0	94	1011	7
6	10	7	280	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	56	10	297.4	3	0	0	94	1010	7
6	10	7	280	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	95	10	297.5	3	0	0	97	1010	7
6	10	7	280	24	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	82	10	297.9	3	0	0	94	1009	7
6	10	8	281	1	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	82	10	298.1	3	0	0	100	1009	7
6	10	8	281	2	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	111	10	298	3	0	0	97	1008	3
6	10	8	281	3	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	77	10	297.9	3	0	0	100	1008	3
6	10	8	281	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	76	10	297.9	3	0	0	100	1009	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	8	281	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	74	10	297.9	3	0	0	97	1009	7
6	10	8	281	6	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	74	10	299.1	3	0	0	100	1010	3
6	10	8	281	7	-2	0.131	-9	-9	-999	109	102.5	0.562	0.7	0.44	1.1	85	10	302.1	3	0	0	88	1010	0
6	10	8	281	8	72.7	0.209	-9	-9	-999	220	-11.3	0.212	0.48	0.24	1.5	95	10	303.6	3	0	0	80	1011	0
6	10	8	281	9	99.9	0.235	-9	-9	-999	263	-11.8	0.212	0.48	0.19	1.7	100	10	304.8	3	0	0	75	1012	6
6	10	8	281	10	143	0.302	-9	-9	-999	381	-17.3	0.212	0.48	0.18	2.3	95	10	305	3	0	0	70	1011	4
6	10	8	281	11	135.1	0.291	-9	-9	-999	361	-16.5	0.212	0.48	0.18	2.2	107	10	305.6	3	0	0	70	1010	7
6	10	8	281	12	47.4	0.238	-9	-9	-999	268	-25.6	0.212	0.48	0.18	1.9	116	10	302.9	3	0	0	66	1009	10
6	10	8	281	13	33.7	0.203	-9	-9	-999	211	-22.5	0.212	0.48	0.18	1.6	112	10	302.4	3	0	0	66	1009	10
6	10	8	281	14	28.6	0.233	-9	-9	-999	259	-40	0.562	0.7	0.18	1.4	85	10	300.8	3	0	0.25	72	1008	10
6	10	8	281	15	19.3	0.148	-9	-9	-999	132	-14.9	0.212	0.48	0.18	1.1	99	10	300.5	3	0	0	80	1008	10
6	10	8	281	16	22	0.159	-9	-9	-999	146	-16.4	0.212	0.48	0.2	1.2	114	10	300.9	3	0	0	85	1008	10
6	10	8	281	17	0.1	0.146	-9	-9	-999	128	-2788.1	0.212	0.48	0.26	1.4	115	10	300.4	3	0	0	82	1008	10
6	10	8	281	18	-2.6	0.062	-9	-9	-999	39	8.4	0.212	0.48	0.55	1.2	107	10	299.5	3	0	0	94	1009	3
6	10	8	281	19	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	60	10	298.8	3	0	0	100	1009	3
6	10	8	281	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	80	10	298.4	3	0	0	97	1009	7
6	10	8	281	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	88	10	298.2	3	0	0	100	1009	7
6	10	8	281	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	106	10	298.2	3	0	0	100	1010	7
6	10	8	281	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	56	10	298.2	3	0	0	97	1010	0
6	10	8	281	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	80	10	298	3	0	0	100	1009	7
6	10	9	282	1	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	102	10	297.9	3	0	0	100	1009	3
6	10	9	282	2	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	93	10	297.8	3	0	0	100	1008	3
6	10	9	282	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	107	10	297.6	3	0	0	94	1008	3
6	10	9	282	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	297.6	3	0	0	100	1009	3
6	10	9	282	5	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	97	10	297.5	3	0	3.56	100	1009	7
6	10	9	282	6	-3.8	0.076	-9	-9	-999	49	10.6	0.562	0.7	1	1.1	82	10	297.4	3	0	0	100	1010	7
6	10	9	282	7	3.1	0.127	-9	-9	-999	104	-60.3	0.212	0.48	0.44	1.1	86	10	298	3	0	0	100	1010	8
6	10	9	282	8	25.2	0.243	-9	-9	-999	276	-51.6	0.562	0.7	0.24	1.5	82	10	298.8	3	0	0	94	1012	10
6	10	9	282	9	33.2	0.222	-9	-9	-999	241	-29.7	0.212	0.48	0.19	1.8	96	10	299.4	3	0	0	88	1013	10
6	10	9	282	10	53.4	0.287	-9	-9	-999	354	-40.1	0.212	0.48	0.18	2.4	110	10	300.1	3	0	0	94	1013	10
6	10	9	282	11	73.2	0.322	-9	-9	-999	421	-41.3	0.212	0.48	0.18	2.7	124	10	300.8	3	0	0	88	1012	9
6	10	9	282	12	73.4	0.247	-9	-9	-999	285	-18.5	0.212	0.48	0.18	1.9	134	10	301.1	3	0	0	82	1011	9
6	10	9	282	13	86.7	0.303	-9	-9	-999	383	-28.8	0.687	0.8	0.18	1.6	149	10	301.9	3	0	0	82	1010	10
6	10	9	282	14	51.5	0.262	-9	-9	-999	308	-31.3	0.687	0.8	0.18	1.4	176	10	301.2	3	0	0	79	1009	10
6	10	9	282	15	37	0.2	-9	-9	-999	207	-19.5	0.687	0.8	0.19	1	164	10	301.2	3	0	0	74	1008	10
6	10	9	282	16	10.2	0.149	-9	-9	-999	132	-28.8	0.212	0.48	0.2	1.2	104	10	300.6	3	0	0	74	1008	10
6	10	9	282	17	0.1	0.156	-9	-9	-999	142	-3428.5	0.212	0.48	0.27	1.5	104	10	299.4	3	0	0	79	1010	10
6	10	9	282	18	-1.4	0.052	-9	-9	-999	35	8.7	0.212	0.48	0.55	1	111	10	298.6	3	0	0	82	1010	7
6	10	9	282	19	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	115	10	298.4	3	0	0	94	1010	7
6	10	9	282	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	103	10	298.1	3	0	0	91	1011	7
6	10	9	282	21	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	50	10	297.9	3	0	0	88	1011	7
6	10	9	282	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	65	10	297.5	3	0	0	88	1011	7
6	10	9	282	23	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	297.9	3	0	0	88	1011	7
6	10	9	282	24	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	298	3	0	0	94	1010	7
6	10	10	283	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	92	10	297.9	3	0	0	94	1009	7
6	10	10	283	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	100	10	297.9	3	0	0	94	1009	7
6	10	10	283	3	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	120	10	297.9	3	0	0	100	1009	3
6	10	10	283	4	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	132	10	298	3	0	0	100	1009	3
6	10	10	283	5	-0.8	0.031	-9	-9	-999	13	3.3	0.212	0.48	1	0.6	129	10	298.1	3	0	0	100	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	10	283	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	122	10	299.6	3	0	0	100	1010	7
6	10	10	283	7	-0.8	0.06	-9	-9	-999	34	23.6	0.212	0.48	0.44	0.9	101	10	302.8	3	0	0	94	1012	0
6	10	10	283	8	58.8	0.156	-9	-9	-999	141	-5.8	0.212	0.48	0.24	1	104	10	303.5	3	0	0	80	1012	0
6	10	10	283	9	72	0.116	-9	-9	-999	91	-2	0.212	0.48	0.19	0.6	116	10	304.4	3	0	0	80	1012	8
6	10	10	283	10	123	0.231	-9	-9	-999	256	-9.1	0.562	0.7	0.18	1.1	341	10	304.1	3	0	0	70	1012	8
6	10	10	283	11	77.5	0.257	-9	-9	-999	299	-19.7	0.562	0.7	0.18	1.4	340	10	303.2	3	0	0	66	1011	10
6	10	10	283	12	11.8	0.281	-9	-9	-999	343	-169.1	0.562	0.7	0.18	1.9	341	10	301.2	3	0	7.37	62	1010	10
6	10	10	283	13	0.1	0.292	-9	-9	-999	363	-8888	0.562	0.7	0.18	2.1	334	10	297.2	3	0	15.49	56	1010	10
6	10	10	283	14	4.2	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	298.4	3	0	1.27	65	1009	10
6	10	10	283	15	11.4	0.122	-9	-9	-999	98	-14.2	0.212	0.48	0.18	0.9	92	10	299.4	3	0	0	79	1009	10
6	10	10	283	16	10.6	0.142	-9	-9	-999	124	-24.4	0.562	0.7	0.2	0.8	59	10	299.8	3	0	0	79	1009	10
6	10	10	283	17	0.1	0.099	-9	-9	-999	71	-865.2	0.562	0.7	0.27	0.7	54	10	299.4	3	0	0	85	1009	10
6	10	10	283	18	-1.5	0.056	-9	-9	-999	30	10.5	0.562	0.7	0.56	0.8	78	10	298.6	3	0	0	82	1009	7
6	10	10	283	19	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.4	3	0	0	88	1009	7
6	10	10	283	20	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	101	10	298.5	3	0	0	88	1010	0
6	10	10	283	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	90	10	298.4	3	0	0	88	1011	7
6	10	10	283	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	298	3	0	0	94	1011	7
6	10	10	283	23	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	83	10	298	3	0	0	97	1011	0
6	10	10	283	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	63	10	298	3	0	0	94	1010	7
6	10	11	284	1	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	109	10	298.1	3	0	0	94	1010	7
6	10	11	284	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	73	10	298.1	3	0	0	97	1009	7
6	10	11	284	3	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	83	10	298.2	3	0	0	94	1009	7
6	10	11	284	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	80	10	298.2	3	0	0	94	1009	7
6	10	11	284	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	62	10	298.1	3	0	0	91	1009	7
6	10	11	284	6	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	96	10	299.8	3	0	0	94	1010	7
6	10	11	284	7	-1.1	0.078	-9	-9	-999	50	39.6	0.212	0.48	0.44	1	111	10	302.9	3	0	0	88	1011	0
6	10	11	284	8	84.5	0.275	-9	-9	-999	331	-22.1	0.687	0.8	0.24	1.4	158	10	304	3	0	0	80	1012	0
6	10	11	284	9	146	0.319	-9	-9	-999	414	-20	0.687	0.8	0.19	1.6	163	10	304.9	3	0	0	80	1012	0
6	10	11	284	10	149.5	0.386	-9	-9	-999	552	-34.8	0.687	0.8	0.18	2.1	196	10	305.5	3	0	0	70	1011	7
6	10	11	284	11	189.4	0.369	-9	-9	-999	515	-23.9	0.687	0.8	0.18	1.9	175	10	306.4	3	0	0	77	1010	7
6	10	11	284	12	185.8	0.195	-9	-9	-999	219	-3.6	0.687	0.8	0.18	0.7	161	10	306.8	3	0	0	72	1010	7
6	10	11	284	13	53.4	0.222	-9	-9	-999	241	-18.5	0.562	0.7	0.18	1.2	25	10	304	3	0	0	70	1009	10
6	10	11	284	14	50.6	0.133	-9	-9	-999	114	-4.2	0.212	0.48	0.18	0.8	89	10	303.5	3	0	0	60	1009	10
6	10	11	284	15	52.1	0.153	-9	-9	-999	138	-6.2	0.212	0.48	0.18	1	89	10	304	3	0	0	85	1008	10
6	10	11	284	16	17.2	0.202	-9	-9	-999	209	-43.1	0.212	0.48	0.2	1.7	119	10	303.4	3	0	0	88	1009	10
6	10	11	284	17	0.1	0.187	-9	-9	-999	186	-5898.6	0.212	0.48	0.27	1.8	126	10	302.1	3	0	0	94	1009	10
6	10	11	284	18	-2.1	0.062	-9	-9	-999	49	10.5	0.212	0.48	0.56	1.2	110	10	300.6	3	0	0	88	1010	7
6	10	11	284	19	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	105	10	299.9	3	0	0	88	1010	7
6	10	11	284	20	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	114	10	299.9	3	0	0	94	1010	7
6	10	11	284	21	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	98	10	299.5	3	0	0	88	1011	3
6	10	11	284	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	68	10	299	3	0	0	94	1010	3
6	10	11	284	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	35	10	298.4	3	0	0	94	1010	3
6	10	11	284	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	45	10	298.2	3	0	0	94	1009	3
6	10	12	285	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	42	10	298	3	0	0	94	1009	3
6	10	12	285	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	63	10	298	3	0	0	94	1008	0
6	10	12	285	3	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	92	10	298.2	3	0	0	100	1008	3
6	10	12	285	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	47	10	297.9	3	0	0	94	1009	3
6	10	12	285	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	297.8	3	0	0	97	1009	7
6	10	12	285	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	98	10	299.8	3	0	0	94	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	12	285	7	-1.3	0.091	-9	-9	-999	63	51	0.212	0.48	0.44	1.1	113	10	302.8	3	0	0	88	1010	0
6	10	12	285	8	67.4	0.208	-9	-9	-999	218	-12	0.212	0.48	0.24	1.5	114	10	304.1	3	0	0	80	1012	0
6	10	12	285	9	98.4	0.225	-9	-9	-999	246	-10.5	0.212	0.48	0.19	1.6	118	10	304.8	3	0	0	80	1012	6
6	10	12	285	10	131.9	0.213	-9	-9	-999	226	-6.6	0.212	0.48	0.18	1.4	122	10	306.2	3	0	0	75	1012	6
6	10	12	285	11	117.5	0.268	-9	-9	-999	320	-14.9	0.212	0.48	0.18	2	114	10	306.1	3	0	0	64	1012	8
6	10	12	285	12	29.5	0.262	-9	-9	-999	308	-55	0.687	0.8	0.18	1.5	169	10	301.9	3	0	0	64	1011	10
6	10	12	285	13	24.8	0.258	-9	-9	-999	302	-62.6	0.687	0.8	0.18	1.5	159	10	300.9	3	0	0	60	1010	10
6	10	12	285	14	22.5	0.159	-9	-9	-999	150	-16.1	0.212	0.48	0.18	1.2	110	10	300.9	3	0	0	82	1009	10
6	10	12	285	15	42.1	0.192	-9	-9	-999	193	-15.1	0.562	0.7	0.18	1	70	10	301.5	3	0	0	88	1008	10
6	10	12	285	16	17.9	0.165	-9	-9	-999	154	-22.7	0.212	0.48	0.2	1.3	99	10	301.5	3	0	0	88	1008	10
6	10	12	285	17	0.1	0.125	-9	-9	-999	102	-1767.1	0.212	0.48	0.27	1.2	107	10	300.5	3	0	0	88	1008	10
6	10	12	285	18	-1.2	0.047	-9	-9	-999	26	7.5	0.212	0.48	0.57	0.9	90	10	300	3	0	0	94	1009	7
6	10	12	285	19	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	98	10	299.4	3	0	0	88	1009	3
6	10	12	285	20	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	70	10	298.9	3	0	0	85	1009	3
6	10	12	285	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	79	10	298.6	3	0	0	94	1009	3
6	10	12	285	22	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	76	10	298.4	3	0	0	94	1009	3
6	10	12	285	23	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	71	10	298.2	3	0	0	100	1009	3
6	10	12	285	24	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	73	10	298.1	3	0	0	100	1008	3
6	10	13	286	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	58	10	297.8	3	0	0	100	1007	3
6	10	13	286	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	102	10	297.8	3	0	0	100	1007	3
6	10	13	286	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	101	10	297.9	3	0	0	100	1006	3
6	10	13	286	4	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	87	10	297.9	3	0	0	100	1007	3
6	10	13	286	5	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	92	10	297.9	3	0	0	97	1007	3
6	10	13	286	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	95	10	299	3	0	0	100	1008	7
6	10	13	286	7	-1.9	0.114	-9	-9	-999	88	70	0.212	0.48	0.44	1.3	120	10	302	3	0	0	94	1009	0
6	10	13	286	8	75.5	0.229	-9	-9	-999	252	-14.4	0.212	0.48	0.24	1.7	126	10	303.9	3	0	0	85	1010	0
6	10	13	286	9	80.6	0.24	-9	-9	-999	271	-15.5	0.212	0.48	0.19	1.8	132	10	304.1	3	0	0	80	1010	7
6	10	13	286	10	111.8	0.238	-9	-9	-999	267	-10.9	0.212	0.48	0.18	1.7	125	10	304.6	3	0	0	75	1010	7
6	10	13	286	11	150	0.246	-9	-9	-999	280	-8.9	0.212	0.48	0.18	1.7	127	10	305.9	3	0	0	82	1009	6
6	10	13	286	12	130.1	0.26	-9	-9	-999	305	-12.2	0.687	0.8	0.18	1.2	149	10	305.8	3	0	0	88	1009	9
6	10	13	286	13	17.2	0.155	-9	-9	-999	145	-19.5	0.212	0.48	0.18	1.2	126	10	302.2	3	0	0	91	1008	10
6	10	13	286	14	18.5	0.147	-9	-9	-999	129	-15.4	0.212	0.48	0.18	1.1	128	10	301.8	3	0	0	75	1007	10
6	10	13	286	15	28.9	0.163	-9	-9	-999	152	-13.5	0.212	0.48	0.18	1.2	107	10	302.1	3	0	0	80	1007	10
6	10	13	286	16	18.4	0.194	-9	-9	-999	196	-35.6	0.212	0.48	0.2	1.6	116	10	302.6	3	0	0	70	1007	10
6	10	13	286	17	0.1	0.136	-9	-9	-999	115	-2210.5	0.212	0.48	0.27	1.3	114	10	301.4	3	0	0	75	1007	10
6	10	13	286	18	-1.5	0.052	-9	-9	-999	31	8.2	0.212	0.48	0.57	1	99	10	300.4	3	0	0	85	1007	7
6	10	13	286	19	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	91	10	300.1	3	0	0	88	1008	7
6	10	13	286	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	79	10	299.6	3	0	0	88	1008	7
6	10	13	286	21	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	65	10	299.1	3	0	0	94	1009	3
6	10	13	286	22	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	86	10	299	3	0	0	100	1009	3
6	10	13	286	23	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	98	10	298.8	3	0	0	100	1008	3
6	10	13	286	24	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	98	10	298.5	3	0	0	100	1008	3
6	10	14	287	1	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	79	10	298.4	3	0	0	94	1007	3
6	10	14	287	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	69	10	298	3	0	0	100	1006	0
6	10	14	287	3	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	52	10	297.6	3	0	0	100	1006	3
6	10	14	287	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	42	10	297.4	3	0	0	100	1006	3
6	10	14	287	5	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	51	10	297.4	3	0	0	100	1007	0
6	10	14	287	6	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	65	10	299.1	3	0	0	94	1008	3
6	10	14	287	7	-0.7	0.047	-9	-9	-999	23	12.5	0.212	0.48	0.44	0.9	110	10	302.5	3	0	0	94	1009	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	14	287	8	67.3	0.208	-9	-9	-999	218	-12	0.212	0.48	0.24	1.5	112	10	304	3	0	0	82	1010	0
6	10	14	287	9	104	0.246	-9	-9	-999	281	-13	0.212	0.48	0.19	1.8	122	10	304.9	3	0	0	75	1010	3
6	10	14	287	10	74.6	0.229	-9	-9	-999	252	-14.5	0.212	0.48	0.18	1.7	103	10	304.4	3	0	0	70	1010	9
6	10	14	287	11	87.1	0.204	-9	-9	-999	211	-8.7	0.212	0.48	0.18	1.4	101	10	304.9	3	0	0	70	1009	9
6	10	14	287	12	69.4	0.246	-9	-9	-999	281	-19.3	0.212	0.48	0.18	1.9	130	10	305.2	3	0	0	91	1008	10
6	10	14	287	13	24.1	0.198	-9	-9	-999	203	-28.9	0.212	0.48	0.18	1.6	123	10	304.1	3	0	0	62	1008	10
6	10	14	287	14	25.3	0.152	-9	-9	-999	136	-12.4	0.212	0.48	0.18	1.1	112	10	303.6	3	0	0	64	1007	10
6	10	14	287	15	47.6	0.21	-9	-9	-999	221	-17.4	0.212	0.48	0.18	1.6	123	10	304	3	0	0	75	1006	10
6	10	14	287	16	24.7	0.208	-9	-9	-999	218	-32.6	0.212	0.48	0.2	1.7	121	10	303.8	3	0	0	70	1007	10
6	10	14	287	17	0.3	0.137	-9	-9	-999	117	-825.7	0.212	0.48	0.27	1.3	115	10	301.9	3	0	0	75	1008	10
6	10	14	287	18	-1.3	0.047	-9	-9	-999	29	7.3	0.212	0.48	0.58	0.9	104	10	300.6	3	0	0	88	1008	7
6	10	14	287	19	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	300	3	0	0	88	1008	7
6	10	14	287	20	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	88	10	299.4	3	0	0	88	1008	0
6	10	14	287	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	82	10	298.9	3	0	0	94	1009	7
6	10	14	287	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	77	10	298.6	3	0	0	94	1009	7
6	10	14	287	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	54	10	298.1	3	0	0	94	1008	7
6	10	14	287	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	74	10	297.9	3	0	0	94	1008	7
6	10	15	288	1	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	81	10	297.9	3	0	0	94	1007	7
6	10	15	288	2	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	75	10	297.9	3	0	0	94	1006	7
6	10	15	288	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	297.5	3	0	0	94	1006	7
6	10	15	288	4	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	45	10	297.4	3	0	0	94	1007	3
6	10	15	288	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	80	10	297.2	3	0	0	94	1007	3
6	10	15	288	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	106	10	299.6	3	0	0	100	1008	7
6	10	15	288	7	-1.7	0.101	-9	-9	-999	74	55.7	0.212	0.48	0.44	1.2	112	10	302.6	3	0	0	88	1009	0
6	10	15	288	8	75.5	0.239	-9	-9	-999	268	-16.2	0.212	0.48	0.24	1.8	125	10	304	3	0	0	85	1010	0
6	10	15	288	9	109.8	0.248	-9	-9	-999	284	-12.5	0.212	0.48	0.19	1.8	133	10	305.4	3	0	0	80	1011	0
6	10	15	288	10	139.1	0.263	-9	-9	-999	310	-11.8	0.212	0.48	0.18	1.9	124	10	306.1	3	0	0	75	1011	4
6	10	15	288	11	130.9	0.242	-9	-9	-999	274	-9.8	0.212	0.48	0.18	1.7	119	10	306.4	3	0	0	64	1010	7
6	10	15	288	12	96.7	0.235	-9	-9	-999	262	-12.1	0.212	0.48	0.18	1.7	109	10	306	3	0	0	60	1009	9
6	10	15	288	13	87.8	0.242	-9	-9	-999	274	-14.6	0.212	0.48	0.18	1.8	114	10	306.2	3	0	0	60	1008	9
6	10	15	288	14	72.4	0.275	-9	-9	-999	332	-25.9	0.212	0.48	0.18	2.2	125	10	305.5	3	0	0	60	1008	9
6	10	15	288	15	62.8	0.253	-9	-9	-999	293	-23.2	0.212	0.48	0.18	2	111	10	304.9	3	0	0	62	1008	9
6	10	15	288	16	18.8	0.231	-9	-9	-999	256	-59.3	0.212	0.48	0.2	2	107	10	303.5	3	0	0	66	1008	10
6	10	15	288	17	0.1	0.156	-9	-9	-999	143	-3422.8	0.212	0.48	0.27	1.5	107	10	301.6	3	0	0	75	1008	10
6	10	15	288	18	-1.9	0.057	-9	-9	-999	38	8.7	0.212	0.48	0.58	1.1	104	10	300.6	3	0	0	85	1008	7
6	10	15	288	19	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	80	10	300.1	3	0	0	88	1009	3
6	10	15	288	20	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	75	10	299.5	3	0	0	88	1009	0
6	10	15	288	21	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	89	10	299.2	3	0	0	88	1010	3
6	10	15	288	22	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	97	10	299	3	0	0	88	1010	3
6	10	15	288	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	95	10	298.9	3	0	0	94	1009	0
6	10	15	288	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	77	10	298.5	3	0	0	94	1009	3
6	10	16	289	1	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	88	10	298.2	3	0	0	88	1008	3
6	10	16	289	2	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	64	10	298	3	0	0	97	1008	0
6	10	16	289	3	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	91	10	297.9	3	0	0	94	1007	3
6	10	16	289	4	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	84	10	298	3	0	0	94	1008	3
6	10	16	289	5	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	94	10	298	3	0	0	97	1008	3
6	10	16	289	6	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	94	10	299.9	3	0	0	94	1009	3
6	10	16	289	7	-1.1	0.068	-9	-9	-999	41	24.9	0.212	0.48	0.44	1	113	10	302.8	3	0	0	88	1010	0
6	10	16	289	8	75.4	0.248	-9	-9	-999	284	-18.2	0.212	0.48	0.24	1.9	123	10	303.9	3	0	0	80	1011	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	16	289	9	106.6	0.284	-9	-9	-999	349	-19.5	0.212	0.48	0.19	2.2	128	10	304.9	3	0	0	75	1012	0
6	10	16	289	10	136	0.282	-9	-9	-999	344	-14.8	0.212	0.48	0.18	2.1	136	10	305.9	3	0	0	66	1011	5
6	10	16	289	11	210	0.373	-9	-9	-999	523	-22.2	0.687	0.8	0.18	1.9	143	10	306.6	3	0	0	60	1010	6
6	10	16	289	12	196.1	0.357	-9	-9	-999	490	-20.8	0.687	0.8	0.18	1.8	140	10	306.9	3	0	0	58	1010	7
6	10	16	289	13	74.5	0.257	-9	-9	-999	304	-20.5	0.212	0.48	0.18	2	137	10	306.4	3	0	0	56	1009	9
6	10	16	289	14	136.6	0.33	-9	-9	-999	436	-23.7	0.687	0.8	0.18	1.7	149	10	306.8	3	0	0	60	1008	8
6	10	16	289	15	65	0.226	-9	-9	-999	252	-16	0.212	0.48	0.18	1.7	137	10	306.1	3	0	0	62	1008	9
6	10	16	289	16	19.4	0.222	-9	-9	-999	241	-51.1	0.212	0.48	0.2	1.9	118	10	304.8	3	0	0	66	1008	10
6	10	16	289	17	0.1	0.146	-9	-9	-999	130	-2788.1	0.212	0.48	0.27	1.4	98	10	302.5	3	0	0	68	1008	10
6	10	16	289	18	-3.3	0.067	-9	-9	-999	42	8.3	0.212	0.48	0.59	1.3	99	10	300.9	3	0	0	79	1008	3
6	10	16	289	19	-3.2	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	97	10	300.1	3	0	0	79	1009	3
6	10	16	289	20	-4.4	0.073	-9	-9	-999	45	7.8	0.212	0.48	1	1.4	90	10	299.6	3	0	0	88	1010	3
6	10	16	289	21	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	89	10	299.2	3	0	0	82	1010	3
6	10	16	289	22	-3.3	0.062	-9	-9	-999	36	6.7	0.212	0.48	1	1.2	90	10	298.9	3	0	0	82	1010	3
6	10	16	289	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	103	10	298.5	3	0	0	88	1009	0
6	10	16	289	24	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	102	10	298.4	3	0	0	94	1008	3
6	10	17	290	1	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	97	10	298.4	3	0	0	94	1007	3
6	10	17	290	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	100	10	298	3	0	0	91	1007	3
6	10	17	290	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	97	10	297.8	3	0	0	88	1007	3
6	10	17	290	4	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	297.9	3	0	0	94	1007	7
6	10	17	290	5	-1.5	0.042	-9	-9	-999	19	4.3	0.212	0.48	1	0.8	92	10	298	3	0	0	94	1007	0
6	10	17	290	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	299.1	3	0	0	100	1008	7
6	10	17	290	7	-0.8	0.047	-9	-9	-999	23	11.8	0.212	0.48	0.45	0.9	104	10	302.2	3	0	0	94	1009	0
6	10	17	290	8	67	0.255	1.004	0.005	545	295	-22.2	0.212	0.48	0.24	2	131	10	303.6	3	0	0	85	1010	0
6	10	17	290	9	108	0.275	1.357	0.006	834	332	-17.4	0.212	0.48	0.19	2.1	135	10	304.8	3	0	0	75	1011	0
6	10	17	290	10	115.1	0.239	1.455	0.006	966	269	-10.7	0.212	0.48	0.18	1.7	129	10	305.4	3	0	0	62	1011	7
6	10	17	290	11	172.8	0.366	1.73	0.005	1081	509	-25.5	0.687	0.8	0.18	1.9	150	10	306	3	0	0	64	1010	7
6	10	17	290	12	173.6	0.326	1.78	0.005	1171	428	-17.9	0.687	0.8	0.18	1.6	159	10	306.8	3	0	0	62	1009	8
6	10	17	290	13	99.8	0.28	1.502	0.005	1222	341	-19.7	0.687	0.8	0.18	1.4	158	10	306.2	3	0	0	58	1008	9
6	10	17	290	14	72.6	0.209	1.365	0.005	1260	221	-11.3	0.212	0.48	0.18	1.5	122	10	305.9	3	0	0	58	1007	9
6	10	17	290	15	24.1	0.16	0.948	0.005	1270	148	-15.4	0.212	0.48	0.18	1.2	120	10	304.4	3	0	0	70	1007	10
6	10	17	290	16	8.8	0.177	0.678	0.005	1273	171	-56.5	0.562	0.7	0.2	1.1	83	10	303	3	0	0	75	1007	10
6	10	17	290	17	0.1	0.153	0.153	0.005	1269	138	-3248.9	0.562	0.7	0.27	1.1	28	10	300.6	3	0	0	77	1007	7
6	10	17	290	18	-1.6	0.056	-9	-9	-999	36	9.4	0.562	0.7	0.59	0.8	67	10	300.4	3	0	0	85	1007	7
6	10	17	290	19	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	95	10	300.4	3	0	0	79	1008	7
6	10	17	290	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	68	10	299.9	3	0	0	85	1008	7
6	10	17	290	21	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	75	10	299.5	3	0	0	82	1009	7
6	10	17	290	22	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	91	10	299.5	3	0	0	82	1008	7
6	10	17	290	23	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	83	10	299.1	3	0	0	85	1008	7
6	10	17	290	24	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	71	10	298.9	3	0	0	88	1007	7
6	10	18	291	1	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.5	3	0	0	88	1006	7
6	10	18	291	2	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	108	10	298.4	3	0	0	94	1006	7
6	10	18	291	3	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	81	10	298.8	3	0	0	94	1006	7
6	10	18	291	4	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	62	10	297.9	3	0	0	94	1006	7
6	10	18	291	5	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	58	10	297.9	3	0	0	97	1007	7
6	10	18	291	6	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	82	10	298.8	3	0	0	94	1008	7
6	10	18	291	7	-0.5	0.036	-9	-9	-999	16	8.3	0.212	0.48	0.45	0.7	98	10	301.1	3	0	0	88	1009	0
6	10	18	291	8	59.9	0.215	0.798	0.005	306	229	-14.9	0.212	0.48	0.24	1.6	117	10	303.4	3	0	0	80	1010	0
6	10	18	291	9	55.4	0.232	1.002	0.006	655	257	-20.2	0.212	0.48	0.19	1.8	120	10	303.4	3	0	0	70	1010	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	18	291	10	108.8	0.228	1.353	0.005	821	250	-9.8	0.212	0.48	0.18	1.6	118	10	304.9	3	0	0	66	1010	7
6	10	18	291	11	36.7	0.253	0.949	0.005	838	293	-39.8	0.687	0.8	0.18	1.4	163	10	303.6	3	0	0	68	1010	10
6	10	18	291	12	35.2	0.252	0.942	0.005	854	292	-41.1	0.687	0.8	0.18	1.4	162	10	301.2	3	0	0.51	66	1009	10
6	10	18	291	13	68.4	0.215	1.191	0.005	888	229	-13	0.687	0.8	0.18	1	170	10	302	3	0	0	66	1008	10
6	10	18	291	14	36.7	0.138	0.974	0.005	906	119	-6.4	0.212	0.48	0.18	0.9	132	10	302.4	3	0	0	72	1007	10
6	10	18	291	15	13.8	0.143	0.706	0.005	912	124	-18.9	0.212	0.48	0.18	1.1	133	10	301.5	3	0	0	75	1007	10
6	10	18	291	16	8.6	-9	-9	-9	916	-999	-99999	0.475	0.6	0.2	0	0	10	300.9	3	0	0	70	1006	10
6	10	18	291	17	0.1	0.072	0.137	0.005	916	44	-334.4	0.562	0.7	0.28	0.5	32	10	300.4	3	0	0	85	1006	10
6	10	18	291	18	-1.1	0.042	-9	-9	-999	19	5.9	0.212	0.48	0.6	0.8	87	10	299.8	3	0	0	82	1006	7
6	10	18	291	19	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	92	10	298.9	3	0	0	94	1007	7
6	10	18	291	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	68	10	298.8	3	0	0	91	1007	7
6	10	18	291	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	137	10	298.6	3	0	0	94	1008	7
6	10	18	291	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	120	10	298.8	3	0	0	88	1008	7
6	10	18	291	23	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	130	10	298.6	3	0	0	94	1008	7
6	10	18	291	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	129	10	298.8	3	0	0	94	1007	7
6	10	19	292	1	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	96	10	298.2	3	0	0	100	1006	3
6	10	19	292	2	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	109	10	298.2	3	0	0	97	1006	7
6	10	19	292	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	119	10	298	3	0	0	100	1006	3
6	10	19	292	4	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	124	10	298	3	0	0	100	1006	3
6	10	19	292	5	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	111	10	297.8	3	0	0	97	1006	7
6	10	19	292	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	125	10	299.4	3	0	0	100	1007	3
6	10	19	292	7	-0.6	0.042	-9	-9	-999	19	10.3	0.212	0.48	0.45	0.8	104	10	302.5	3	0	0	94	1008	0
6	10	19	292	8	82.3	0.172	-9	-9	-999	164	-5.6	0.212	0.48	0.24	1.1	120	10	304.1	3	0	0	80	1008	0
6	10	19	292	9	107.9	0.228	-9	-9	-999	250	-9.8	0.212	0.48	0.19	1.6	127	10	304.8	3	0	0	75	1008	0
6	10	19	292	10	107.8	0.178	-9	-9	-999	173	-4.7	0.212	0.48	0.18	1.1	124	10	305.6	3	0	0	66	1008	7
6	10	19	292	11	56.2	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	304.8	3	0	0	66	1007	10
6	10	19	292	12	37.8	0.24	-9	-9	-999	270	-32.7	0.674	0.73	0.17	1.3	249	10	301.5	3	0	11.94	60	1006	10
6	10	19	292	13	25.5	0.326	-9	-9	-999	427	-121.6	0.687	0.8	0.18	2	202	10	298.5	3	0	15.49	52	1006	10
6	10	19	292	14	73.3	0.18	-9	-9	-999	188	-7.2	0.212	0.48	0.18	1.2	99	10	301.2	3	0	0.25	82	1005	9
6	10	19	292	15	72.8	0.243	-9	-9	-999	275	-17.6	0.562	0.7	0.18	1.3	22	10	302.8	3	0	0	94	1005	9
6	10	19	292	16	15.4	0.161	-9	-9	-999	150	-24.1	0.562	0.7	0.2	0.9	45	10	301.9	3	0	0	70	1005	10
6	10	19	292	17	0.1	0.085	-9	-9	-999	59	-554.9	0.562	0.7	0.28	0.6	77	10	300.9	3	0	0	75	1005	10
6	10	19	292	18	-0.8	0.036	-9	-9	-999	16	5.2	0.212	0.48	0.6	0.7	105	10	300.2	3	0	0	85	1006	7
6	10	19	292	19	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	300	3	0	0	85	1007	7
6	10	19	292	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	87	10	299.8	3	0	0	88	1008	7
6	10	19	292	21	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	73	10	299.2	3	0	0	88	1008	7
6	10	19	292	22	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	90	10	299.1	3	0	0	88	1008	7
6	10	19	292	23	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	298.9	3	0	0	94	1008	7
6	10	19	292	24	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	82	10	298.9	3	0	0	94	1008	7
6	10	20	293	1	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	82	10	298.9	3	0	0	94	1007	7
6	10	20	293	2	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	89	10	298	3	0	0	94	1006	7
6	10	20	293	3	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	82	10	297.8	3	0	0	94	1006	7
6	10	20	293	4	-2	0.052	-9	-9	-999	27	6.2	0.212	0.48	1	1	101	10	297.6	3	0	0	94	1006	7
6	10	20	293	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	110	10	297.9	3	0	0	94	1006	0
6	10	20	293	6	-2.8	0.067	-9	-9	-999	40	9.7	0.687	0.8	1	0.9	151	10	298.9	3	0	0	94	1007	7
6	10	20	293	7	-3.4	0.146	-9	-9	-999	128	81.4	0.687	0.8	0.45	1.2	151	10	301.4	3	0	0	94	1008	0
6	10	20	293	8	65.8	0.254	0.944	0.005	459	295	-22.5	0.687	0.8	0.24	1.3	175	10	302.4	3	0	0	82	1009	6
6	10	20	293	9	105.1	0.322	1.255	0.005	678	420	-28.6	0.687	0.8	0.2	1.7	155	10	302.4	3	0	0	75	1009	8
6	10	20	293	10	191.2	0.356	1.704	0.005	934	488	-21.2	0.687	0.8	0.18	1.8	156	10	304.5	3	0	0	79	1009	4

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	20	293	11	129	0.329	1.565	0.005	1070	434	-24.8	0.687	0.8	0.18	1.7	172	10	304.4	3	0	0	75	1008	9
6	10	20	293	12	98.5	0.346	1.476	0.005	1175	468	-37.8	0.687	0.8	0.18	1.9	161	10	304.4	3	0	0	75	1007	9
6	10	20	293	13	121.5	0.34	1.64	0.005	1306	456	-29	0.687	0.8	0.18	1.8	160	10	305.2	3	0	0	85	1006	9
6	10	20	293	14	91	0.253	1.525	0.005	1400	295	-15.9	0.212	0.48	0.18	1.9	111	10	304	3	0	0	94	1006	9
6	10	20	293	15	45.1	0.18	1.219	0.005	1442	178	-11.7	0.212	0.48	0.18	1.3	95	10	301.9	3	0	0	94	1005	10
6	10	20	293	16	14.8	0.162	0.843	0.005	1455	151	-26.1	0.212	0.48	0.2	1.3	109	10	301.2	3	0	0	88	1005	10
6	10	20	293	17	0.1	0.105	0.16	0.005	1451	78	-1031.6	0.212	0.48	0.28	1	97	10	299.9	3	0	0	94	1006	10
6	10	20	293	18	-3.3	0.076	-9	-9	-999	49	12.2	0.562	0.7	0.61	1.1	74	10	298.5	3	0	0	88	1007	7
6	10	20	293	19	-5.3	0.09	-9	-9	-999	62	12.6	0.562	0.7	1	1.3	80	10	298.2	3	0	0	88	1008	7
6	10	20	293	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	100	10	298.1	3	0	0	94	1009	7
6	10	20	293	21	-2.3	0.052	-9	-9	-999	27	5.4	0.212	0.48	1	1	88	10	298.2	3	0	0	94	1010	0
6	10	20	293	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	78	10	298.4	3	0	0	94	1010	7
6	10	20	293	23	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	298.5	3	0	0	97	1010	7
6	10	20	293	24	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	70	10	298.8	3	0	0	94	1009	7
6	10	21	294	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	87	10	298.4	3	0	0	100	1008	7
6	10	21	294	2	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	97	10	298.8	3	0	0	97	1008	7
6	10	21	294	3	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	113	10	299.2	3	0	0	88	1009	7
6	10	21	294	4	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	130	10	299.4	3	0	0	88	1009	7
6	10	21	294	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	137	10	299.1	3	0	0	94	1010	7
6	10	21	294	6	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	172	10	299.4	3	0	0	94	1011	7
6	10	21	294	7	-7.6	0.293	-9	-9	-999	365	298	0.674	0.73	0.44	2.1	226	10	300	3	0	0	94	1012	0
6	10	21	294	8	101.7	0.294	1.04	0.005	399	366	-22.5	0.687	0.8	0.24	1.5	213	10	302.1	3	0	0	91	1013	0
6	10	21	294	9	109.8	0.149	1.154	0.005	505	145	-2.7	0.687	0.8	0.2	0.5	185	10	303.8	3	0	0	88	1013	7
6	10	21	294	10	49.4	0.114	1.042	0.005	828	88	-2.7	0.24	0.3	0.16	0.6	250	10	303.5	3	0	0	75	1013	9
6	10	21	294	11	51.8	0.194	1.094	0.005	912	196	-12.7	0.687	0.8	0.18	0.9	160	10	301.6	3	0	0	75	1012	10
6	10	21	294	12	38	0.177	1.009	0.005	975	171	-13.1	0.562	0.7	0.18	0.9	81	10	300.5	3	0	0	82	1012	10
6	10	21	294	13	99.7	0.212	1.469	0.005	1147	225	-8.6	0.562	0.7	0.18	1	78	10	302.4	3	0	0	82	1010	9
6	10	21	294	14	62.1	0.196	1.293	0.005	1254	200	-10.9	0.212	0.48	0.18	1.4	89	10	302.8	3	0	0	70	1009	9
6	10	21	294	15	45.8	0.19	1.192	0.005	1334	191	-13.6	0.212	0.48	0.18	1.4	118	10	303.4	3	0	0	70	1009	10
6	10	21	294	16	7.9	0.155	0.666	0.005	1343	140	-42.2	0.212	0.48	0.2	1.3	110	10	302.1	3	0	0	70	1010	10
6	10	21	294	17	0.1	0.115	0.155	0.005	1338	90	-1369.8	0.212	0.48	0.28	1.1	96	10	300.8	3	0	0	77	1010	7
6	10	21	294	18	-2.7	0.069	-9	-9	-999	42	11.1	0.562	0.7	0.61	1	80	10	299.5	3	0	0	82	1010	7
6	10	21	294	19	-3.8	0.076	-9	-9	-999	49	10.7	0.562	0.7	1	1.1	76	10	299	3	0	0	82	1011	7
6	10	21	294	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	102	10	298.9	3	0	0	85	1012	0
6	10	21	294	21	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	121	10	298.9	3	0	0	82	1013	7
6	10	21	294	22	-0.8	0.035	-9	-9	-999	15	4.9	0.562	0.7	1	0.5	72	10	298.9	3	0	0	94	1012	7
6	10	21	294	23	-1.3	0.042	-9	-9	-999	20	5.1	0.562	0.7	1	0.6	80	10	298.5	3	0	0	94	1012	0
6	10	21	294	24	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	66	10	298	3	0	0	100	1011	3
6	10	22	295	1	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	72	10	297.8	3	0	0	94	1010	3
6	10	22	295	2	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	82	10	297.8	3	0	0	97	1010	3
6	10	22	295	3	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	87	10	297.6	3	0	0	100	1010	3
6	10	22	295	4	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	76	10	297.6	3	0	0	100	1010	3
6	10	22	295	5	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	46	10	297.2	3	0	0	100	1010	3
6	10	22	295	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	79	10	299.1	3	0	0	100	1011	7
6	10	22	295	7	-1.3	0.057	-9	-9	-999	31	13	0.212	0.48	0.45	1.1	105	10	302.2	3	0	0	94	1012	0
6	10	22	295	8	73.6	0.238	1.047	0.005	563	267	-16.5	0.212	0.48	0.24	1.8	114	10	303.6	3	0	0	85	1013	0
6	10	22	295	9	113.9	0.229	1.345	0.007	772	252	-9.5	0.212	0.48	0.19	1.6	117	10	305.1	3	0	0	75	1013	0
6	10	22	295	10	110.6	0.209	1.367	0.006	834	220	-7.4	0.212	0.48	0.18	1.4	120	10	305.4	3	0	0	66	1013	7
6	10	22	295	11	141.4	0.225	1.532	0.006	919	245	-7.3	0.212	0.48	0.18	1.5	107	10	306.4	3	0	0	57	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	22	295	12	134.2	0.193	1.548	0.006	999	196	-4.8	0.212	0.48	0.18	1.2	103	10	306.6	3	0	0	56	1011	7
6	10	22	295	13	104.8	0.198	1.456	0.006	1062	202	-6.7	0.212	0.48	0.18	1.3	118	10	307.4	3	0	0	56	1010	8
6	10	22	295	14	68.5	0.179	1.28	0.006	1102	174	-7.5	0.212	0.48	0.18	1.2	118	10	306.6	3	0	0	54	1009	9
6	10	22	295	15	19.8	0.099	0.849	0.006	1111	73	-4.4	0.212	0.48	0.18	0.6	100	10	304.9	3	0	0	56	1009	10
6	10	22	295	16	17.8	0.165	0.822	0.006	1122	154	-22.7	0.212	0.48	0.2	1.3	116	10	304.6	3	0	0	62	1009	10
6	10	22	295	17	0.1	0.125	0.146	0.006	1118	102	-1768.8	0.212	0.48	0.28	1.2	106	10	302.4	3	0	0	70	1009	10
6	10	22	295	18	-2.1	0.052	-9	-9	-999	29	6.1	0.212	0.48	0.62	1	99	10	301.2	3	0	0	75	1009	3
6	10	22	295	19	-1.7	0.049	-9	-9	-999	25	6.1	0.562	0.7	1	0.7	72	10	300.2	3	0	0	85	1010	3
6	10	22	295	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	69	10	299.9	3	0	0	88	1011	7
6	10	22	295	21	-3.5	0.069	-9	-9	-999	42	8.6	0.562	0.7	1	1	75	10	299.5	3	0	0	94	1011	3
6	10	22	295	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	83	10	299.4	3	0	0	94	1011	7
6	10	22	295	23	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	91	10	299	3	0	0	94	1011	0
6	10	22	295	24	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	85	10	298.9	3	0	0	94	1010	7
6	10	23	296	1	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	80	10	298.9	3	0	0	100	1009	7
6	10	23	296	2	-1.5	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	101	10	298.9	3	0	0	97	1009	0
6	10	23	296	3	-1.4	0.042	-9	-9	-999	19	4.5	0.212	0.48	1	0.8	94	10	298.6	3	0	0	100	1009	3
6	10	23	296	4	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	83	10	298.6	3	0	0.51	100	1009	3
6	10	23	296	5	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	62	10	298.5	3	0	0	97	1010	7
6	10	23	296	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	100	10	298.5	3	0	4.83	94	1011	7
6	10	23	296	7	3	0.115	-9	-9	-999	90	-46.2	0.562	0.7	0.45	0.7	83	10	299.1	3	0	0.25	94	1011	8
6	10	23	296	8	78.2	0.193	-9	-9	-999	194	-8.2	0.562	0.7	0.24	0.9	63	10	301.4	3	0	0	100	1011	0
6	10	23	296	9	66.8	0.168	-9	-9	-999	159	-6.4	0.212	0.48	0.19	1.1	99	10	303	3	0	0	91	1011	8
6	10	23	296	10	71.1	0.169	-9	-9	-999	160	-6.1	0.212	0.48	0.18	1.1	89	10	303.4	3	0	0.25	85	1011	9
6	10	23	296	11	97	0.186	-9	-9	-999	184	-5.9	0.212	0.48	0.18	1.2	115	10	304	3	0	0.51	97	1010	8
6	10	23	296	12	67.5	0.189	-9	-9	-999	189	-9	0.562	0.7	0.18	0.9	83	10	302.4	3	0	2.03	91	1009	10
6	10	23	296	13	37.9	0.264	-9	-9	-999	313	-43.8	0.562	0.7	0.18	1.6	6	10	300.4	3	0	2.03	91	1008	10
6	10	23	296	14	36	0.226	-9	-9	-999	248	-28.8	0.562	0.7	0.18	1.3	16	10	300.5	3	0	1.52	85	1008	10
6	10	23	296	15	15.4	0.173	-9	-9	-999	165	-30.1	0.562	0.7	0.18	1	70	10	301	3	0	0.76	85	1008	10
6	10	23	296	16	3.5	0.137	-9	-9	-999	117	-65.5	0.687	0.8	0.21	0.8	205	10	299.9	3	0	0.25	80	1008	10
6	10	23	296	17	0.1	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.28	0	0	10	299	3	0	0.25	85	1009	10
6	10	23	296	18	-0.5	0.031	-9	-9	-999	13	5	0.212	0.48	0.62	0.6	106	10	298.9	3	0	0	88	1009	10
6	10	23	296	19	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	93	10	298.9	3	0	0	100	1009	7
6	10	23	296	20	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	76	10	298.9	3	0	1.52	97	1010	7
6	10	23	296	21	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	58	10	298.5	3	0	0	94	1011	7
6	10	23	296	22	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	50	10	298.1	3	0	0	100	1011	7
6	10	23	296	23	-1.6	0.056	-9	-9	-999	30	9.5	0.562	0.7	1	0.8	69	10	297.9	3	0	0	100	1011	10
6	10	23	296	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	79	10	297.9	3	0	0	100	1010	7
6	10	24	297	1	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	91	10	297.9	3	0	0	100	1009	7
6	10	24	297	2	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	99	10	297.6	3	0	0	100	1009	0
6	10	24	297	3	-999	-9	-9	-9	-999	-999	-99999	0.562	0.7	1	0.7	84	10	297.5	3	0	0	99	1008	99
6	10	24	297	4	-999	-9	-9	-9	-999	-999	-99999	0.212	0.48	1	0.7	100	10	297.5	3	0	0	98	1009	99
6	10	24	297	5	-2.3	0.052	-9	-9	-999	27	5.6	0.212	0.48	1	1	107	10	297.9	3	0	0	97	1009	3
6	10	24	297	6	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	105	10	298.5	3	0	0	94	1009	7
6	10	24	297	7	-1.4	0.057	-9	-9	-999	31	11.6	0.212	0.48	0.45	1.1	107	10	300.8	3	0	0	100	1010	0
6	10	24	297	8	53.8	0.174	-9	-9	-999	167	-8.8	0.212	0.48	0.24	1.2	108	10	302.8	3	0	0	88	1011	0
6	10	24	297	9	75.7	0.2	-9	-9	-999	206	-9.5	0.212	0.48	0.19	1.4	103	10	303.4	3	0	0	80	1011	8
6	10	24	297	10	132.5	0.213	-9	-9	-999	227	-6.6	0.212	0.48	0.18	1.4	128	10	305	3	0	0	70	1011	5
6	10	24	297	11	105.1	0.177	-9	-9	-999	172	-4.8	0.212	0.48	0.18	1.1	132	10	305.4	3	0	0	72	1010	8
6	10	24	297	12	128.2	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.17	0	0	10	306	3	0	0	66	1009	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	24	297	13	21.4	0.203	-9	-9	-999	210	-35.2	0.562	0.7	0.18	1.2	349	10	301.4	3	0	19.05	64	1008	10
6	10	24	297	14	9.5	0.188	-9	-9	-999	188	-62.7	0.674	0.73	0.17	1.1	236	10	299.9	3	0	4.57	68	1008	10
6	10	24	297	15	22.7	-9	-9	-9	-999	-999	-99999	0.475	0.6	0.18	0	0	10	300.9	3	0	0	75	1008	10
6	10	24	297	16	7.1	0.137	-9	-9	-999	116	-32.3	0.562	0.7	0.2	0.8	39	10	300.2	3	0	0	94	1008	10
6	10	24	297	17	0.1	0.085	-9	-9	-999	58	-556.5	0.562	0.7	0.28	0.6	73	10	299.8	3	0	0	85	1008	7
6	10	24	297	18	-1.4	0.049	-9	-9	-999	25	7.5	0.562	0.7	0.62	0.7	63	10	299.2	3	0	0	88	1009	7
6	10	24	297	19	-1.8	0.049	-9	-9	-999	25	5.9	0.562	0.7	1	0.7	64	10	299	3	0	0	91	1010	0
6	10	24	297	20	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	82	10	298.8	3	0	0	94	1010	7
6	10	24	297	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	95	10	298.6	3	0	0	94	1010	7
6	10	24	297	22	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	99	10	298.5	3	0	0	100	1010	7
6	10	24	297	23	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	99	10	298.4	3	0	0	100	1010	7
6	10	24	297	24	-0.5	0.026	-9	-9	-999	10	3.1	0.212	0.48	1	0.5	126	10	298	3	0	0	100	1010	7
6	10	25	298	1	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	155	10	297.9	3	0	0	100	1010	7
6	10	25	298	2	-1.7	0.052	-9	-9	-999	27	7.6	0.687	0.8	1	0.7	145	10	298	3	0	0	100	1009	7
6	10	25	298	3	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	145	10	298.1	3	0	0	100	1009	7
6	10	25	298	4	-1.3	0.045	-9	-9	-999	22	6.5	0.687	0.8	1	0.6	148	10	298.4	3	0	0	100	1010	7
6	10	25	298	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	137	10	298.6	3	0	0	97	1010	0
6	10	25	298	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	105	10	299.9	3	0	0	100	1011	7
6	10	25	298	7	-0.5	0.036	-9	-9	-999	16	7.9	0.212	0.48	0.45	0.7	111	10	302.8	3	0	0	100	1012	0
6	10	25	298	8	91	0.264	0.989	0.005	384	311	-18.2	0.687	0.8	0.25	1.3	151	10	303.5	3	0	0	91	1012	0
6	10	25	298	9	106	0.268	1.372	0.006	881	320	-16.4	0.687	0.8	0.2	1.3	146	10	304.1	3	0	0	85	1012	7
6	10	25	298	10	184.1	0.272	1.722	0.006	1003	326	-9.8	0.687	0.8	0.18	1.2	165	10	306	3	0	0	80	1012	5
6	10	25	298	11	163.1	0.296	1.712	0.005	1112	370	-14.3	0.687	0.8	0.18	1.4	156	10	306.6	3	0	0	68	1012	8
6	10	25	298	12	114.2	0.297	1.553	0.005	1183	373	-20.7	0.687	0.8	0.18	1.5	169	10	303.5	3	0	2.54	88	1011	9
6	10	25	298	13	63.7	0.199	1.294	0.005	1226	208	-11.1	0.687	0.8	0.18	0.9	153	10	304.2	3	0	0	85	1010	10
6	10	25	298	14	43.7	0.18	1.151	0.005	1256	176	-12	0.212	0.48	0.18	1.3	133	10	304.8	3	0	0	66	1009	10
6	10	25	298	15	31.4	0.212	1.037	0.005	1276	224	-27.2	0.212	0.48	0.18	1.7	117	10	304.4	3	0	0	62	1009	10
6	10	25	298	16	12.6	0.198	0.765	0.005	1282	202	-55.4	0.212	0.48	0.2	1.7	118	10	302.9	3	0	0	66	1009	10
6	10	25	298	17	0.1	0.115	0.153	0.005	1279	92	-1368.5	0.212	0.48	0.29	1.1	109	10	301.2	3	0	0	75	1009	10
6	10	25	298	18	-2.3	0.063	-9	-9	-999	36	9.7	0.562	0.7	0.63	0.9	77	10	300.1	3	0	0	82	1009	7
6	10	25	298	19	-3.1	0.069	-9	-9	-999	42	9.7	0.562	0.7	1	1	85	10	299.5	3	0	0	88	1010	7
6	10	25	298	20	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	93	10	299.1	3	0	0	94	1010	7
6	10	25	298	21	-2	0.056	-9	-9	-999	30	7.8	0.562	0.7	1	0.8	72	10	298.9	3	0	0	94	1010	7
6	10	25	298	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	70	10	298.5	3	0	0	94	1010	7
6	10	25	298	23	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	90	10	298.4	3	0	0	88	1010	7
6	10	25	298	24	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	94	10	298.4	3	0	0	94	1010	7
6	10	26	299	1	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	125	10	298.9	3	0	0	100	1009	7
6	10	26	299	2	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	130	10	298.9	3	0	0	97	1009	0
6	10	26	299	3	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	111	10	298.1	3	0	0	100	1009	7
6	10	26	299	4	-2	0.056	-9	-9	-999	30	7.7	0.562	0.7	1	0.8	75	10	297.9	3	0	0	94	1009	7
6	10	26	299	5	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	83	10	297.6	3	0	0	97	1010	7
6	10	26	299	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	58	10	298.4	3	0	0	100	1010	7
6	10	26	299	7	-0.9	0.049	-9	-9	-999	25	11.7	0.562	0.7	0.46	0.7	77	10	302.1	3	0	0	88	1010	0
6	10	26	299	8	66.7	0.236	0.787	0.005	264	263	-17.7	0.212	0.48	0.25	1.8	116	10	304	3	0	0	82	1012	0
6	10	26	299	9	100.8	0.255	1.194	0.005	610	296	-14.9	0.212	0.48	0.19	1.9	123	10	304.9	3	0	0	75	1013	3
6	10	26	299	10	58.2	0.252	1.052	0.005	722	290	-24.7	0.212	0.48	0.18	2	137	10	304.4	3	0	0	75	1012	9
6	10	26	299	11	60.2	0.197	1.084	0.005	764	202	-11.5	0.687	0.8	0.18	0.9	182	10	302.1	3	0	0	68	1011	10
6	10	26	299	12	66.3	0.207	1.176	0.005	883	217	-12.1	0.212	0.48	0.18	1.5	125	10	305	3	0	0	70	1010	10
6	10	26	299	13	91.9	0.262	1.405	0.006	1088	308	-17.6	0.212	0.48	0.18	2	122	10	305.6	3	0	0	64	1009	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	26	299	14	87.6	0.252	1.407	0.006	1146	290	-16.4	0.212	0.48	0.18	1.9	126	10	306.1	3	0	0	60	1009	9
6	10	26	299	15	48.2	0.21	1.158	0.006	1163	222	-17.3	0.212	0.48	0.19	1.6	112	10	305.2	3	0	0	66	1009	10
6	10	26	299	16	26.2	0.199	0.948	0.006	1172	205	-27.2	0.212	0.48	0.21	1.6	105	10	304.1	3	0	0	66	1009	10
6	10	26	299	17	0.1	0.146	0.148	0.006	1170	129	-2791.8	0.212	0.48	0.29	1.4	108	10	301.9	3	0	0	75	1009	10
6	10	26	299	18	-2.2	0.057	-9	-9	-999	35	7.6	0.212	0.48	0.63	1.1	107	10	300.9	3	0	0	79	1010	7
6	10	26	299	19	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	300	3	0	0	79	1010	3
6	10	26	299	20	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	99	10	299.4	3	0	0	88	1011	3
6	10	26	299	21	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	69	10	299	3	0	0	94	1011	3
6	10	26	299	22	-1.7	0.049	-9	-9	-999	25	6	0.562	0.7	1	0.7	71	10	298.8	3	0	0	94	1011	3
6	10	26	299	23	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	62	10	298.2	3	0	0	94	1010	3
6	10	26	299	24	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	80	10	298.2	3	0	0	100	1010	3
6	10	27	300	1	-1.3	0.042	-9	-9	-999	20	5.2	0.562	0.7	1	0.6	72	10	298	3	0	0	94	1009	3
6	10	27	300	2	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	101	10	297.8	3	0	0	97	1009	3
6	10	27	300	3	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	92	10	297.9	3	0	0	94	1009	3
6	10	27	300	4	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	112	10	297.5	3	0	0	100	1009	7
6	10	27	300	5	-1.1	0.036	-9	-9	-999	16	3.8	0.212	0.48	1	0.7	86	10	297.5	3	0	0	97	1009	0
6	10	27	300	6	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	116	10	299.4	3	0	0	94	1010	7
6	10	27	300	7	-1.2	0.052	-9	-9	-999	27	10.7	0.212	0.48	0.46	1	108	10	302.5	3	0	0	94	1010	0
6	10	27	300	8	68	0.188	1.142	0.005	791	188	-8.8	0.212	0.48	0.25	1.3	116	10	304	3	0	0	82	1012	0
6	10	27	300	9	98.1	0.186	1.332	0.005	870	184	-5.9	0.212	0.48	0.2	1.2	135	10	305.1	3	0	0	75	1012	4
6	10	27	300	10	119.7	0.18	1.473	0.005	964	176	-4.4	0.212	0.48	0.18	1.1	120	10	306	3	0	0	66	1012	6
6	10	27	300	11	72.6	0.204	1.27	0.005	1017	212	-10.5	0.562	0.7	0.18	1	348	10	304.6	3	0	0	64	1011	10
6	10	27	300	12	27.7	0.22	0.927	0.005	1036	238	-34.8	0.562	0.7	0.18	1.3	342	10	302.4	3	0	2.29	60	1010	10
6	10	27	300	13	60.3	0.251	1.219	0.005	1081	289	-23.5	0.674	0.73	0.17	1.3	239	10	303.1	3	0	0.25	65	1008	10
6	10	27	300	14	34.9	-9	-9	-9	1108	-999	-99999	0.475	0.6	0.18	0	0	10	303.9	3	0	0	70	1008	10
6	10	27	300	15	13	0.167	0.74	0.005	1116	158	-32.4	0.687	0.8	0.19	0.9	173	10	301.9	3	0	0	66	1007	10
6	10	27	300	16	22.2	-9	-9	-9	1131	-999	-99999	0.475	0.6	0.2	0	0	10	301.4	3	0	0	75	1007	10
6	10	27	300	17	1.9	0.214	0.391	0.005	1129	228	-463.1	0.562	0.7	0.29	1.5	46	10	298.8	3	0	1.27	97	1008	10
6	10	27	300	18	-1.8	0.056	-9	-9	-999	64	8.4	0.562	0.7	0.64	0.8	83	10	298.1	3	0	0	100	1008	7
6	10	27	300	19	-1	0.036	-9	-9	-999	17	4.4	0.212	0.48	1	0.7	97	10	297.9	3	0	0	100	1009	7
6	10	27	300	20	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	59	10	297.9	3	0	0	97	1009	7
6	10	27	300	21	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	86	10	298	3	0	0	94	1010	7
6	10	27	300	22	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	76	10	298.1	3	0	0	100	1010	7
6	10	27	300	23	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	126	10	298.1	3	0	0	100	1010	7
6	10	27	300	24	-2.2	0.06	-9	-9	-999	34	8.6	0.687	0.8	1	0.8	156	10	298.5	3	0	0	100	1008	7
6	10	28	301	1	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	124	10	298.2	3	0	0	100	1008	7
6	10	28	301	2	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	88	10	298.1	3	0	0	76	1008	7
6	10	28	301	3	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	96	10	298	3	0	0	100	1008	7
6	10	28	301	4	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	101	10	298	3	0	0	94	1008	7
6	10	28	301	5	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	101	10	298	3	0	0	97	1008	7
6	10	28	301	6	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	88	10	298.4	3	0	0	94	1009	7
6	10	28	301	7	-1.3	0.052	-9	-9	-999	27	9.4	0.212	0.48	0.46	1	86	10	299.6	3	0	0	100	1010	0
6	10	28	301	8	39.4	0.158	0.5	0.005	114	145	-9.1	0.212	0.48	0.25	1.1	92	10	301.2	3	0	0	88	1011	8
6	10	28	301	9	72.5	0.209	0.862	0.005	318	220	-11.3	0.212	0.48	0.2	1.5	112	10	302.9	3	0	0	80	1012	8
6	10	28	301	10	20.8	0.233	0.6	0.005	373	258	-54.7	0.212	0.48	0.18	2	125	10	300.5	3	0	1.78	85	1012	10
6	10	28	301	11	57.7	0.145	0.948	0.005	532	130	-4.8	0.212	0.48	0.18	0.9	120	10	299.4	3	0	0.51	97	1011	10
6	10	28	301	12	92.9	0.205	1.263	0.005	781	213	-8.3	0.212	0.48	0.18	1.4	101	10	301.5	3	0	0.76	100	1010	9
6	10	28	301	13	90.2	0.223	1.289	0.005	855	243	-11.1	0.212	0.48	0.18	1.6	95	10	302	3	0	0	100	1009	9
6	10	28	301	14	54.3	0.222	1.107	0.005	899	240	-18.1	0.212	0.48	0.18	1.7	101	10	302	3	0	0	97	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	28	301	15	30.3	0.192	0.919	0.005	924	194	-21.1	0.212	0.48	0.19	1.5	102	10	301.9	3	0	0	91	1008	10
6	10	28	301	16	10.4	0.149	0.646	0.005	932	132	-28.4	0.212	0.48	0.21	1.2	111	10	301.4	3	0	0	85	1008	10
6	10	28	301	17	0.1	0.115	0.138	0.005	931	90	-1368	0.212	0.48	0.29	1.1	89	10	300.4	3	0	0	94	1009	10
6	10	28	301	18	-0.9	0.036	-9	-9	-999	20	4.7	0.212	0.48	0.64	0.7	98	10	299.1	3	0	0	100	1009	7
6	10	28	301	19	-1.6	0.047	-9	-9	-999	23	5.6	0.212	0.48	1	0.9	88	10	298.9	3	0	0	94	1009	7
6	10	28	301	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	90	10	298.6	3	0	0	97	1009	7
6	10	28	301	21	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	81	10	298.4	3	0	0	94	1010	7
6	10	28	301	22	-0.7	0.031	-9	-9	-999	13	3.8	0.212	0.48	1	0.6	119	10	298.4	3	0	1.27	88	1010	7
6	10	28	301	23	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	62	10	298.2	3	0	0.25	97	1009	7
6	10	28	301	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	72	10	298.2	3	0	0.25	100	1008	7
6	10	29	302	1	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	83	10	298.2	3	0	0	94	1008	7
6	10	29	302	2	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	38	10	298.1	3	0	0.25	100	1007	7
6	10	29	302	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	83	10	298	3	0	0	100	1007	7
6	10	29	302	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	298	3	0	0.25	100	1007	7
6	10	29	302	5	-2.4	0.057	-9	-9	-999	31	6.9	0.212	0.48	1	1.1	101	10	298	3	0	1.52	97	1008	7
6	10	29	302	6	-3.3	0.062	-9	-9	-999	36	6.5	0.212	0.48	1	1.2	99	10	298	3	0	1.27	100	1009	0
6	10	29	302	7	-0.4	0.042	-9	-9	-999	20	17.2	0.562	0.7	0.46	0.6	51	10	298.1	3	0	0	100	1010	10
6	10	29	302	8	23.8	0.141	0.423	0.008	115	121	-10.6	0.212	0.48	0.25	1	93	10	299.5	3	0	0.25	97	1012	9
6	10	29	302	9	3.8	0.091	0.232	0.008	120	64	-18.3	0.212	0.48	0.2	0.7	113	10	299	3	0	0	100	1012	10
6	10	29	302	10	0.8	0.093	0.141	0.008	121	65	-86.8	0.562	0.7	0.18	0.6	72	10	298.4	3	0	4.06	100	1012	10
6	10	29	302	11	13.4	0.113	0.373	0.008	139	88	-9.8	0.687	0.8	0.18	0.5	161	10	298.9	3	0	0.76	100	1011	10
6	10	29	302	12	18.2	0.125	0.437	0.007	164	101	-9.6	0.562	0.7	0.18	0.6	36	10	299	3	0	0.51	97	1010	10
6	10	29	302	13	4.9	0.095	0.285	0.007	171	67	-15.9	0.562	0.7	0.18	0.5	75	10	298.9	3	0	2.54	94	1009	10
6	10	29	302	14	6.7	0.124	0.322	0.007	180	100	-25.6	0.562	0.7	0.18	0.7	61	10	298.8	3	0	0.51	97	1009	10
6	10	29	302	15	14.2	0.147	0.43	0.006	200	129	-19.9	0.562	0.7	0.18	0.8	58	10	298.9	3	0	0	100	1008	10
6	10	29	302	16	0.8	0.157	0.166	0.006	201	143	-426.7	0.562	0.7	0.21	1.1	63	10	298.8	3	0	0	94	1008	10
6	10	29	302	17	0.1	0.167	0.083	0.006	201	157	-4207	0.562	0.7	0.29	1.2	60	10	298.4	3	0	0	94	1007	10
6	10	29	302	18	-4.9	0.09	-9	-9	-999	64	13.5	0.562	0.7	0.64	1.3	74	10	298.2	3	0	0	100	1007	7
6	10	29	302	19	-4.5	0.083	-9	-9	-999	55	11.6	0.562	0.7	1	1.2	73	10	298.4	3	0	0.25	88	1008	7
6	10	29	302	20	-2	0.052	-9	-9	-999	27	6.3	0.212	0.48	1	1	99	10	298	3	0	0	91	1009	7
6	10	29	302	21	-2.9	0.062	-9	-9	-999	36	7.5	0.212	0.48	1	1.2	102	10	298.4	3	0	0.51	88	1009	7
6	10	29	302	22	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	64	10	298.1	3	0	0	100	1009	7
6	10	29	302	23	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	70	10	297.9	3	0	0	97	1009	7
6	10	29	302	24	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	61	10	297.9	3	0	0	100	1008	7
6	10	30	303	1	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	57	10	297.6	3	0	0.25	100	1007	7
6	10	30	303	2	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	65	10	297.6	3	0	0	100	1007	7
6	10	30	303	3	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	51	10	297.5	3	0	0	100	1007	7
6	10	30	303	4	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	50	10	297.2	3	0	0	100	1007	7
6	10	30	303	5	-1.3	0.042	-9	-9	-999	20	5	0.562	0.7	1	0.6	52	10	297.2	3	0	0	100	1007	0
6	10	30	303	6	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	47	10	298.5	3	0	0	100	1007	7
6	10	30	303	7	-1.3	0.056	-9	-9	-999	30	11.9	0.562	0.7	0.46	0.8	64	10	301.2	3	0	0	94	1008	0
6	10	30	303	8	82.1	0.22	0.818	0.005	240	237	-11.7	0.562	0.7	0.25	1.1	84	10	302.9	3	0	0	85	1009	0
6	10	30	303	9	73	0.268	0.932	0.005	399	319	-23.8	0.562	0.7	0.19	1.5	80	10	301.8	3	0	0.25	88	1010	9
6	10	30	303	10	37.4	0.205	0.8	0.005	492	215	-20.8	0.212	0.48	0.18	1.6	92	10	301	3	0	0.25	91	1010	10
6	10	30	303	11	20.3	0.157	0.676	0.005	545	144	-17.3	0.212	0.48	0.18	1.2	92	10	299.1	3	0	9.65	80	1009	10
6	10	30	303	12	46.3	0.171	0.955	0.005	676	163	-9.7	0.212	0.48	0.18	1.2	108	10	300.4	3	0	0	85	1008	10
6	10	30	303	13	75.3	0.22	1.199	0.005	822	237	-12.7	0.212	0.48	0.18	1.6	96	10	302.1	3	0	0	85	1007	9
6	10	30	303	14	77.4	0.267	1.251	0.005	908	318	-22.2	0.212	0.48	0.18	2.1	97	10	303.8	3	0	0	91	1006	9
6	10	30	303	15	39.6	0.225	1.016	0.005	950	246	-25.9	0.212	0.48	0.19	1.8	93	10	302.9	3	0	0	75	1006	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	10	30	303	16	16.1	0.173	0.757	0.005	964	166	-28.9	0.212	0.48	0.21	1.4	111	10	301.2	3	0	0	75	1006	10
6	10	30	303	17	0.1	0.074	0.139	0.005	963	51	-370.3	0.212	0.48	0.29	0.7	100	10	300	3	0	0	80	1006	10
6	10	30	303	18	-0.9	0.036	-9	-9	-999	16	4.7	0.212	0.48	0.65	0.7	87	10	299.4	3	0	0	82	1006	7
6	10	30	303	19	-1.5	0.049	-9	-9	-999	25	6.8	0.562	0.7	1	0.7	80	10	299	3	0	0	88	1007	7
6	10	30	303	20	-1	0.036	-9	-9	-999	16	4.4	0.212	0.48	1	0.7	109	10	298.8	3	0	0	91	1008	7
6	10	30	303	21	-1.3	0.042	-9	-9	-999	19	5	0.212	0.48	1	0.8	117	10	298.4	3	0	0	94	1008	7
6	10	30	303	22	-1.1	0.042	-9	-9	-999	20	5.8	0.562	0.7	1	0.6	57	10	297.8	3	0	0	94	1008	7
6	10	30	303	23	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	75	10	297.4	3	0	0	100	1007	7
6	10	30	303	24	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	40	10	297	3	0	0	94	1007	3
6	10	31	304	1	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	37	10	296.9	3	0	0	88	1006	7
6	10	31	304	2	-0.8	0.035	-9	-9	-999	15	4.8	0.562	0.7	1	0.5	83	10	296.8	3	0	0	97	1006	7
6	10	31	304	3	-0.6	0.026	-9	-9	-999	10	2.8	0.212	0.48	1	0.5	113	10	296.5	3	0	0	100	1006	3
6	10	31	304	4	-0.9	0.035	-9	-9	-999	15	4.3	0.562	0.7	1	0.5	78	10	296.1	3	0	0	94	1006	3
6	10	31	304	5	-0.7	0.031	-9	-9	-999	13	3.7	0.212	0.48	1	0.6	129	10	296	3	0	0	85	1007	7
6	10	31	304	6	-1.1	0.036	-9	-9	-999	16	3.9	0.212	0.48	1	0.7	120	10	296.9	3	0	0	88	1007	3
6	10	31	304	7	-2.1	0.069	-9	-9	-999	42	14.3	0.562	0.7	0.46	1	82	10	300.5	3	0	0	88	1008	0
6	10	31	304	8	72.7	0.199	1.103	0.005	664	205	-9.8	0.212	0.48	0.25	1.4	92	10	303.1	3	0	0	80	1009	0
6	10	31	304	9	110.2	0.267	1.331	0.005	771	317	-15.5	0.212	0.48	0.2	2	96	10	304.1	3	0	0	70	1010	0
6	10	31	304	10	133.8	0.263	1.496	0.005	902	309	-12.2	0.212	0.48	0.18	1.9	103	10	305	3	0	0	66	1010	4
6	10	31	304	11	142.2	0.274	1.601	0.005	1041	329	-13	0.212	0.48	0.18	2	110	10	305.4	3	0	0	75	1009	6
6	10	31	304	12	142.6	0.274	1.672	0.005	1181	330	-12.9	0.212	0.48	0.18	2	112	10	305.8	3	0	0	62	1008	7
6	10	31	304	13	108.3	0.247	1.57	0.005	1287	283	-12.6	0.212	0.48	0.18	1.8	110	10	305.6	3	0	0	58	1007	8
6	10	31	304	14	55.6	0.241	1.275	0.005	1339	273	-22.7	0.212	0.48	0.18	1.9	107	10	304.8	3	0	0	70	1007	10
6	10	31	304	15	44.8	0.218	1.199	0.005	1382	234	-20.8	0.212	0.48	0.19	1.7	111	10	304.5	3	0	0	66	1007	10
6	10	31	304	16	28.7	0.201	1.04	0.005	1408	207	-25.3	0.212	0.48	0.21	1.6	105	10	303.5	3	0	0	61	1007	10
6	10	31	304	17	0.1	0.115	0.158	0.005	1402	92	-1365.3	0.212	0.48	0.29	1.1	103	10	301.4	3	0	0	70	1007	10
6	10	31	304	18	-2.7	0.063	-9	-9	-999	36	8.1	0.562	0.7	0.65	0.9	84	10	300.1	3	0	0	74	1007	3
6	10	31	304	19	-2.5	0.063	-9	-9	-999	36	8.7	0.562	0.7	1	0.9	63	10	299.4	3	0	0	82	1007	7
6	10	31	304	20	-1.9	0.047	-9	-9	-999	23	4.9	0.212	0.48	1	0.9	96	10	299	3	0	0	88	1008	0
6	10	31	304	21	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	102	10	298.6	3	0	0	94	1008	3
6	10	31	304	22	-1.8	0.047	-9	-9	-999	23	5	0.212	0.48	1	0.9	96	10	298.4	3	0	0	94	1008	3
6	10	31	304	23	-1.4	0.042	-9	-9	-999	19	4.4	0.212	0.48	1	0.8	102	10	298.1	3	0	0	100	1008	3
6	10	31	304	24	-2.2	0.056	-9	-9	-999	30	6.9	0.562	0.7	1	0.8	83	10	298.2	3	0	0	100	1007	3
6	11	1	305	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	76	10	298.4	3	0	0	94	1007	7
6	11	1	305	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	298.1	3	0	0	100	1007	7
6	11	1	305	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	98	10	297.9	3	0	0	100	1007	3
6	11	1	305	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	75	10	297.4	3	0	0	94	1007	3
6	11	1	305	5	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	297.4	3	0	0	100	1007	7
6	11	1	305	6	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	89	10	299.4	3	0	0	100	1008	7
6	11	1	305	7	-2.8	0.081	-9	-9	-999	53	17.1	0.655	0.64	0.47	1.1	81	10	301.2	3	0	0	94	1009	0
6	11	1	305	8	59.9	0.235	0.818	0.005	328	261	-19.4	0.37	0.38	0.25	1.5	100	10	303	3	0	0	82	1010	0
6	11	1	305	9	94	0.268	1.104	0.005	516	319	-18.4	0.37	0.38	0.2	1.7	109	10	304.4	3	0	0	75	1010	0
6	11	1	305	10	117.5	0.296	1.323	0.005	709	370	-19.9	0.37	0.38	0.19	1.9	102	10	305.4	3	0	0	66	1009	0
6	11	1	305	11	131.1	0.332	1.574	0.005	1073	439	-25	0.37	0.38	0.19	2.2	112	10	305.5	3	0	0	63	1009	5
6	11	1	305	12	122.7	0.297	1.602	0.005	1206	373	-19.3	0.37	0.38	0.18	1.9	110	10	305.9	3	0	0	58	1008	6
6	11	1	305	13	93.7	0.279	1.505	0.005	1308	339	-20.8	0.37	0.38	0.19	1.8	98	10	305.6	3	0	0	58	1008	8
6	11	1	305	14	54.6	0.265	1.276	0.005	1367	314	-30.5	0.37	0.38	0.19	1.8	113	10	305.4	3	0	0	62	1007	9
6	11	1	305	15	31.1	0.232	1.065	0.005	1396	257	-35.8	0.37	0.38	0.19	1.6	94	10	303.5	3	0	0	70	1007	10
6	11	1	305	16	18.9	0.212	0.906	0.005	1414	224	-45.2	0.37	0.38	0.21	1.5	88	10	302.4	3	0	0	70	1007	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	1	305	17	0.1	0.146	0.158	0.005	1408	129	-2804.9	0.37	0.38	0.3	1.2	103	10	300	3	0	0	79	1007	10
6	11	1	305	18	-2.6	0.066	-9	-9	-999	41	10.1	0.655	0.64	0.65	0.9	76	10	299.4	3	0	0	82	1007	7
6	11	1	305	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	299.2	3	0	0	82	1008	3
6	11	1	305	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	298.8	3	0	0	85	1009	3
6	11	1	305	21	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	91	10	298.4	3	0	0	94	1009	3
6	11	1	305	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	298.1	3	0	0	88	1009	3
6	11	1	305	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	74	10	297.9	3	0	0	91	1009	7
6	11	1	305	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	297.8	3	0	0	94	1008	3
6	11	2	306	1	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	86	10	297.5	3	0	0	94	1008	3
6	11	2	306	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	297.5	3	0	0	100	1007	3
6	11	2	306	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	297.6	3	0	1.52	100	1007	3
6	11	2	306	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	297.6	3	0	0.76	100	1007	3
6	11	2	306	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	297.2	3	0	0	100	1008	7
6	11	2	306	6	-2	0.054	-9	-9	-999	29	7	0.736	0.77	1	0.7	151	10	297.8	3	0	0	100	1009	3
6	11	2	306	7	-2.1	0.069	-9	-9	-999	42	13.8	0.736	0.77	0.47	0.9	145	10	298.6	3	0	1.02	94	1010	0
6	11	2	306	8	65.4	0.192	0.894	0.005	394	193	-9.7	0.37	0.38	0.26	1.1	115	10	302.5	3	0	0	94	1011	0
6	11	2	306	9	89	0.244	1.102	0.005	542	277	-14.7	0.37	0.38	0.2	1.5	117	10	304.1	3	0	0	85	1011	0
6	11	2	306	10	97.7	0.235	1.241	0.005	705	263	-12	0.37	0.38	0.19	1.4	133	10	304.5	3	0	0	79	1011	7
6	11	2	306	11	115.9	0.205	1.424	0.005	899	214	-6.7	0.37	0.38	0.19	1.1	114	10	305.1	3	0	0.25	70	1010	6
6	11	2	306	12	116.6	0.218	1.523	0.005	1091	235	-8	0.736	0.77	0.17	0.9	174	10	303.8	3	0	0	70	1009	9
6	11	2	306	13	49.8	0.148	1.174	0.005	1170	132	-5.8	0.655	0.64	0.18	0.6	360	10	302.2	3	0	7.37	75	1008	10
6	11	2	306	14	54.6	0.149	1.241	0.006	1258	133	-5.5	0.655	0.64	0.18	0.6	344	10	301.4	3	0	6.1	64	1007	10
6	11	2	306	15	28.4	0.164	1.012	0.006	1311	153	-13.9	0.37	0.38	0.19	1	123	10	303	3	0	0.25	70	1007	10
6	11	2	306	16	17.8	0.211	0.872	0.006	1339	222	-47.3	0.37	0.38	0.21	1.5	117	10	302.8	3	0	0	70	1008	10
6	11	2	306	17	0.1	0.134	0.155	0.006	1331	114	-2171	0.37	0.38	0.3	1.1	114	10	300.5	3	0	0	70	1008	10
6	11	2	306	18	-1.9	0.055	-9	-9	-999	32	7.5	0.37	0.38	0.66	0.9	108	10	299.1	3	0	0	82	1009	7
6	11	2	306	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	298.8	3	0	0	88	1009	7
6	11	2	306	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	82	10	298.2	3	0	0	88	1010	0
6	11	2	306	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	298.1	3	0	0	88	1010	7
6	11	2	306	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	62	10	297.9	3	0	0	94	1010	3
6	11	2	306	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	66	10	297.4	3	0	0	97	1009	7
6	11	2	306	24	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	87	10	297.6	3	0	0	100	1009	3
6	11	3	307	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	71	10	297.4	3	0	0	100	1008	3
6	11	3	307	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	297	3	0	0	97	1008	7
6	11	3	307	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	296.9	3	0	0	100	1007	3
6	11	3	307	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	297	3	0	0	100	1008	3
6	11	3	307	5	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	297.1	3	0	0	100	1009	3
6	11	3	307	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	101	10	298.5	3	0	0	94	1009	3
6	11	3	307	7	-2.6	0.073	-9	-9	-999	45	13.3	0.37	0.38	0.48	1.2	87	10	301.1	3	0	0	88	1010	0
6	11	3	307	8	57.4	0.234	1.088	0.005	809	260	-20	0.37	0.38	0.26	1.5	109	10	302.9	3	0	0	91	1011	0
6	11	3	307	9	85.3	0.265	1.346	0.005	1033	314	-19.7	0.37	0.38	0.2	1.7	118	10	304.2	3	0	0	80	1012	0
6	11	3	307	10	83.9	0.254	1.362	0.005	1087	294	-17.6	0.37	0.38	0.19	1.6	97	10	304.4	3	0	0	88	1011	8
6	11	3	307	11	134.1	0.298	1.634	0.005	1174	375	-17.8	0.655	0.64	0.18	1.5	82	10	304.8	3	0	0	75	1010	8
6	11	3	307	12	62.1	0.258	1.279	0.005	1213	303	-25	0.736	0.77	0.17	1.3	165	10	303.4	3	0	0	66	1009	10
6	11	3	307	13	44.8	0.209	1.155	0.005	1239	220	-18.4	0.736	0.77	0.17	1	161	10	301.2	3	0	0.25	62	1008	10
6	11	3	307	14	42.4	0.216	1.143	0.005	1268	231	-21.4	0.37	0.38	0.19	1.4	125	10	302.9	3	0	0	77	1007	10
6	11	3	307	15	23.9	0.172	0.948	0.005	1282	165	-19.2	0.37	0.38	0.19	1.1	131	10	301.1	3	0	0	80	1007	10
6	11	3	307	16	7.4	0.155	0.641	0.005	1286	141	-45.6	0.37	0.38	0.21	1.1	101	10	300.9	3	0	0	75	1008	10
6	11	3	307	17	0.1	0.134	0.153	0.005	1285	113	-2170.3	0.37	0.38	0.3	1.1	107	10	300	3	0	0	77	1008	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	3	307	18	-2	0.055	-9	-9	-999	32	7.5	0.37	0.38	0.66	0.9	105	10	299.4	3	0	0	88	1008	7
6	11	3	307	19	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	59	10	298.8	3	0	0	88	1009	7
6	11	3	307	20	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	77	10	298.2	3	0	0	94	1010	0
6	11	3	307	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	298	3	0	0	94	1010	3
6	11	3	307	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	297.8	3	0	0	94	1010	3
6	11	3	307	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	90	10	297.5	3	0	0	97	1009	0
6	11	3	307	24	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	99	10	297.4	3	0	0	100	1009	3
6	11	4	308	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	72	10	297.2	3	0	0	100	1008	3
6	11	4	308	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	48	10	296.6	3	0	0	97	1007	3
6	11	4	308	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	296.5	3	0	0	100	1007	3
6	11	4	308	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	83	10	296.9	3	0	0	100	1008	3
6	11	4	308	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	296.9	3	0	0	100	1008	3
6	11	4	308	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	298.5	3	0	0	100	1009	3
6	11	4	308	7	-2.4	0.073	-9	-9	-999	46	14.8	0.655	0.64	0.47	1	71	10	301.6	3	0	0	100	1010	0
6	11	4	308	8	91.2	0.26	0.897	0.005	285	305	-17.4	0.655	0.64	0.25	1.3	83	10	303.4	3	0	0	77	1010	0
6	11	4	308	9	86.5	0.255	1.213	0.005	744	296	-17.2	0.37	0.38	0.2	1.6	107	10	304.2	3	0	0	75	1011	0
6	11	4	308	10	104.1	0.248	1.322	0.005	801	284	-13.2	0.37	0.38	0.19	1.5	108	10	305	3	0	0	66	1010	6
6	11	4	308	11	118.6	0.285	1.405	0.005	843	351	-17.6	0.37	0.38	0.19	1.8	98	10	305.6	3	0	0	66	1009	6
6	11	4	308	12	83.3	0.276	1.27	0.005	885	333	-22.6	0.37	0.38	0.19	1.8	95	10	304.6	3	0	0	66	1008	9
6	11	4	308	13	60.4	0.235	1.174	0.005	964	262	-19.3	0.37	0.38	0.19	1.5	109	10	303.9	3	0	0	65	1008	9
6	11	4	308	14	28.9	0.208	0.931	0.005	1002	219	-28	0.37	0.38	0.19	1.4	137	10	303.8	3	0	0	68	1007	10
6	11	4	308	15	17.1	0.111	0.787	0.005	1023	88	-7.1	0.37	0.38	0.19	0.6	97	10	302.9	3	0	0	80	1007	10
6	11	4	308	16	4	0.159	0.485	0.005	1025	146	-91.3	0.37	0.38	0.21	1.2	104	10	301.6	3	0	0	88	1007	10
6	11	4	308	17	0.1	0.147	0.142	0.005	1022	130	-2878.4	0.655	0.64	0.29	1	77	10	300.8	3	0	0	79	1007	3
6	11	4	308	18	-5.3	0.088	-9	-9	-999	61	11.6	0.655	0.64	0.66	1.2	85	10	299.6	3	0	0	94	1008	3
6	11	4	308	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	77	10	298.8	3	0	0	94	1008	3
6	11	4	308	20	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	97	10	298.4	3	0	0	100	1009	3
6	11	4	308	21	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	86	10	298.2	3	0	2.54	94	1009	3
6	11	4	308	22	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	73	10	297.8	3	0	4.32	88	1009	3
6	11	4	308	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	78	10	297.8	3	0	0	94	1008	7
6	11	4	308	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	71	10	297.5	3	0	0	100	1008	7
6	11	5	309	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	297.4	3	0	0	100	1007	3
6	11	5	309	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	49	10	297.1	3	0	0	94	1007	3
6	11	5	309	3	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	102	10	297.1	3	0	2.03	100	1007	3
6	11	5	309	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	297.2	3	0	0	100	1007	7
6	11	5	309	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	296.9	3	0	0.25	97	1007	7
6	11	5	309	6	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	86	10	297.5	3	0	0.25	100	1008	0
6	11	5	309	7	-2.5	0.073	-9	-9	-999	46	14.1	0.655	0.64	0.47	1	66	10	300.4	3	0	0	94	1009	0
6	11	5	309	8	57	0.233	0.762	0.005	279	259	-20.1	0.37	0.38	0.26	1.5	107	10	302.4	3	0	0	91	1009	0
6	11	5	309	9	87.3	0.287	1.165	0.005	652	354	-24.5	0.37	0.38	0.2	1.9	120	10	303.2	3	0	0	80	1010	0
6	11	5	309	10	104.8	0.293	1.364	0.005	872	364	-21.5	0.37	0.38	0.19	1.9	128	10	303.9	3	0	0	75	1009	6
6	11	5	309	11	141.9	0.393	1.612	0.005	1062	567	-38.5	0.736	0.77	0.18	2.1	140	10	302.9	3	0	0	91	1008	8
6	11	5	309	12	58.2	0.208	1.218	0.005	1117	243	-13.9	0.655	0.64	0.18	1	79	10	301.1	3	0	0.51	92	1007	10
6	11	5	309	13	39.9	0.199	1.085	0.005	1151	204	-17.7	0.655	0.64	0.18	1	29	10	300.6	3	0	0	94	1007	10
6	11	5	309	14	77.3	0.295	1.381	0.005	1223	369	-29.8	0.655	0.64	0.18	1.6	82	10	303.4	3	0	0	85	1006	9
6	11	5	309	15	34.9	0.255	1.069	0.005	1254	297	-42.8	0.37	0.38	0.19	1.8	105	10	303.9	3	0	0	80	1005	10
6	11	5	309	16	10.3	0.192	0.712	0.005	1260	194	-61.6	0.37	0.38	0.21	1.4	115	10	302.2	3	0	0	80	1006	10
6	11	5	309	17	0.1	0.122	0.152	0.005	1258	99	-1636.6	0.37	0.38	0.3	1	121	10	300.8	3	0	0	77	1006	7
6	11	5	309	18	-1.2	0.042	-9	-9	-999	24	5.8	0.37	0.38	0.67	0.7	99	10	299.6	3	0	0	88	1006	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	5	309	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	112	10	299	3	0	0	88	1007	7
6	11	5	309	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	102	10	298.4	3	0	0	94	1007	3
6	11	5	309	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	42	10	298	3	0	0	88	1008	3
6	11	5	309	22	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	76	10	297.8	3	0	0	100	1008	3
6	11	5	309	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	53	10	297.5	3	0	0	97	1007	3
6	11	5	309	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	67	10	297.1	3	0	0	100	1007	3
6	11	6	310	1	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	93	10	296.9	3	0	0	100	1007	3
6	11	6	310	2	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	106	10	296.9	3	0	0	100	1006	3
6	11	6	310	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	125	10	297	3	0	0	100	1007	3
6	11	6	310	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	128	10	297.1	3	0	0	94	1007	7
6	11	6	310	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	118	10	297	3	0	0	100	1007	7
6	11	6	310	6	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	83	10	297.4	3	0	0	94	1008	7
6	11	6	310	7	-2.4	0.067	-9	-9	-999	40	11.2	0.37	0.38	0.48	1.1	88	10	299.4	3	0	0	94	1009	0
6	11	6	310	8	33.4	0.254	0.549	0.005	178	295	-44.5	0.37	0.38	0.26	1.8	102	10	300	3	0	0	91	1010	7
6	11	6	310	9	28.8	0.328	0.608	0.005	281	432	-110.6	0.37	0.38	0.2	2.5	112	10	298.6	3	0	0.76	94	1010	10
6	11	6	310	10	52.3	0.242	0.806	0.005	361	277	-24.4	0.37	0.38	0.19	1.6	126	10	300	3	0	0.25	88	1010	9
6	11	6	310	11	73.6	0.228	1.17	0.005	783	251	-14.5	0.37	0.38	0.19	1.4	104	10	302.8	3	0	0	79	1009	9
6	11	6	310	12	68.8	0.249	1.166	0.005	830	285	-20.1	0.37	0.38	0.19	1.6	107	10	302.9	3	0	0	59	1008	9
6	11	6	310	13	91.6	0.267	1.316	0.005	894	318	-18.7	0.37	0.38	0.19	1.7	111	10	303.8	3	0	0	61	1007	8
6	11	6	310	14	49.1	0.262	1.082	0.005	928	309	-33.1	0.37	0.38	0.19	1.8	113	10	304	3	0	0	65	1007	10
6	11	6	310	15	34.8	0.245	0.974	0.005	951	278	-37.7	0.37	0.38	0.19	1.7	111	10	303.5	3	0	0	65	1006	10
6	11	6	310	16	22.7	0.204	0.848	0.005	966	212	-33.5	0.37	0.38	0.21	1.4	105	10	302.9	3	0	0	65	1006	10
6	11	6	310	17	0.1	0.134	0.139	0.005	964	114	-2167.4	0.37	0.38	0.3	1.1	102	10	300.8	3	0	0	70	1006	3
6	11	6	310	18	-2.8	0.061	-9	-9	-999	36	7.2	0.37	0.38	0.67	1	106	10	299.4	3	0	0	77	1007	3
6	11	6	310	19	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	83	10	298.6	3	0	0	88	1008	3
6	11	6	310	20	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	67	10	298.1	3	0	0	82	1008	0
6	11	6	310	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	297.9	3	0	0	88	1009	3
6	11	6	310	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	297.8	3	0	0	94	1009	3
6	11	6	310	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	297.4	3	0	0	94	1008	3
6	11	6	310	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297.4	3	0	0	94	1008	3
6	11	7	311	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	104	10	297.1	3	0	0	100	1007	3
6	11	7	311	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	110	10	297.2	3	0	0	94	1007	3
6	11	7	311	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	86	10	297.2	3	0	0	100	1007	3
6	11	7	311	4	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	85	10	296.8	3	0	0	90	1007	3
6	11	7	311	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	65	10	296.5	3	0	0	94	1007	3
6	11	7	311	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	297.5	3	0	0	94	1008	3
6	11	7	311	7	-1.3	0.051	-9	-9	-999	27	9.3	0.655	0.64	0.48	0.7	67	10	298.9	3	0	0	94	1009	0
6	11	7	311	8	36.1	0.168	0.465	0.005	100	159	-11.9	0.37	0.38	0.26	1	90	10	301.4	3	0	0	75	1010	7
6	11	7	311	9	55.8	0.265	0.925	0.005	511	314	-30.1	0.37	0.38	0.2	1.8	107	10	302.5	3	0	0	70	1010	8
6	11	7	311	10	94.9	0.3	1.256	0.005	753	379	-25.7	0.37	0.38	0.19	2	100	10	304.1	3	0	0	61	1010	7
6	11	7	311	11	99.4	0.302	1.35	0.005	891	381	-24.9	0.37	0.38	0.19	2	108	10	304.5	3	0	0	63	1009	7
6	11	7	311	12	111.2	0.305	1.471	0.005	1031	388	-23	0.37	0.38	0.19	2	124	10	305.4	3	0	0	56	1008	7
6	11	7	311	13	63.1	0.29	1.245	0.005	1100	359	-34.7	0.37	0.38	0.19	2	121	10	304.4	3	0	0	58	1007	9
6	11	7	311	14	30.6	0.264	0.986	0.005	1125	312	-53.7	0.37	0.38	0.19	1.9	127	10	304.9	3	0	0	59	1007	10
6	11	7	311	15	41.3	0.281	1.1	0.005	1157	342	-48	0.37	0.38	0.19	2	112	10	304.4	3	0	0	66	1007	9
6	11	7	311	16	20.4	0.235	0.872	0.005	1171	262	-57	0.37	0.38	0.22	1.7	107	10	303.2	3	0	0	66	1007	10
6	11	7	311	17	0.1	0.134	0.148	0.005	1168	117	-2168.1	0.37	0.38	0.3	1.1	95	10	301.1	3	0	0	72	1007	3
6	11	7	311	18	-3	0.066	-9	-9	-999	40	8.7	0.655	0.64	0.67	0.9	82	10	299.9	3	0	0	79	1007	3
6	11	7	311	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	299.4	3	0	0	82	1008	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	7	311	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	70	10	298.8	3	0	0	85	1008	0
6	11	7	311	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	298.2	3	0	0	88	1009	3
6	11	7	311	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	98	10	298.4	3	0	0	88	1009	3
6	11	7	311	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	298.1	3	0	0	97	1009	3
6	11	7	311	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	297.5	3	0	0	100	1008	3
6	11	8	312	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	47	10	297.2	3	0	0	94	1007	3
6	11	8	312	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	297.2	3	0	0	100	1007	3
6	11	8	312	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	297.1	3	0	0	100	1007	3
6	11	8	312	4	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	57	10	296.9	3	0	0	100	1007	3
6	11	8	312	5	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	73	10	296.8	3	0	0	100	1008	0
6	11	8	312	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	48	10	298.2	3	0	0	100	1008	3
6	11	8	312	7	-2.1	0.066	-9	-9	-999	39	12.4	0.655	0.64	0.48	0.9	75	10	301.8	3	0	0	100	1009	0
6	11	8	312	8	60.7	0.224	0.732	0.005	233	243	-16.6	0.37	0.38	0.26	1.4	108	10	303.5	3	0	0	82	1010	0
6	11	8	312	9	79.3	0.274	0.969	0.005	413	330	-23.4	0.37	0.38	0.2	1.8	110	10	304.4	3	0	0	75	1010	2
6	11	8	312	10	111.5	0.284	1.265	0.005	654	347	-18.4	0.37	0.38	0.19	1.8	113	10	305.5	3	0	0	66	1009	3
6	11	8	312	11	122.5	0.286	1.475	0.005	944	353	-17.2	0.37	0.38	0.19	1.8	97	10	305.9	3	0	0	66	1008	6
6	11	8	312	12	103.7	0.292	1.432	0.005	1018	364	-21.7	0.37	0.38	0.19	1.9	94	10	305.5	3	0	0	62	1008	8
6	11	8	312	13	69.6	0.271	1.274	0.006	1067	324	-25.6	0.37	0.38	0.19	1.8	105	10	305	3	0	0	62	1007	9
6	11	8	312	14	19.2	0.277	0.833	0.006	1080	336	-99.7	0.37	0.38	0.19	2.1	107	10	304.6	3	0	0	59	1006	10
6	11	8	312	15	40.1	0.269	1.074	0.006	1108	321	-43.6	0.37	0.38	0.19	1.9	114	10	304.5	3	0	0	58	1006	9
6	11	8	312	16	19.2	0.244	0.843	0.006	1120	278	-68.3	0.37	0.38	0.22	1.8	113	10	303.4	3	0	0	61	1006	10
6	11	8	312	17	0.1	0.134	0.146	0.006	1117	118	-2167.4	0.37	0.38	0.31	1.1	115	10	301.2	3	0	0	70	1006	10
6	11	8	312	18	-1.8	0.049	-9	-9	-999	29	5.8	0.37	0.38	0.67	0.8	98	10	300.4	3	0	0	79	1007	3
6	11	8	312	19	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	93	10	299.8	3	0	0	82	1008	3
6	11	8	312	20	-1.9	0.051	-9	-9	-999	27	6.6	0.655	0.64	1	0.7	78	10	299.4	3	0	0	91	1008	3
6	11	8	312	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	298.8	3	0	0	94	1009	3
6	11	8	312	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	298.6	3	0	0	94	1009	3
6	11	8	312	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	38	10	298.1	3	0	0	94	1009	3
6	11	8	312	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	297.9	3	0	0	100	1008	3
6	11	9	313	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	32	10	297.8	3	0	0	100	1008	3
6	11	9	313	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	33	10	297.6	3	0	0	100	1008	3
6	11	9	313	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	37	10	297.4	3	0	0	100	1008	3
6	11	9	313	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	58	10	297.2	3	0	0	100	1008	3
6	11	9	313	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	297	3	0	0	100	1009	3
6	11	9	313	6	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	104	10	298.5	3	0	0	100	1009	3
6	11	9	313	7	-3.8	0.088	-9	-9	-999	60	16.1	0.655	0.64	0.49	1.2	79	10	301.2	3	0	0	94	1010	0
6	11	9	313	8	60.4	0.223	-9	-9	-999	243	-16.7	0.37	0.38	0.26	1.4	87	10	303	3	0	0	80	1011	0
6	11	9	313	9	82.7	0.275	-9	-9	-999	332	-22.8	0.37	0.38	0.2	1.8	102	10	304.2	3	0	0	75	1012	0
6	11	9	313	10	89.5	0.31	-9	-9	-999	396	-29.9	0.37	0.38	0.19	2.1	91	10	303.1	3	0	0	85	1011	7
6	11	9	313	11	105.7	0.314	-9	-9	-999	405	-26.5	0.37	0.38	0.19	2.1	90	10	304.9	3	0	0	66	1010	7
6	11	9	313	12	110	0.305	-9	-9	-999	388	-23.2	0.37	0.38	0.19	2	92	10	305.6	3	0	0	62	1009	7
6	11	9	313	13	54.5	0.254	-9	-9	-999	295	-27	0.37	0.38	0.19	1.7	102	10	304.8	3	0	0	62	1008	10
6	11	9	313	14	16.4	0.188	-9	-9	-999	188	-36.3	0.37	0.38	0.19	1.3	87	10	304	3	0	0	60	1008	10
6	11	9	313	15	42.4	0.26	-9	-9	-999	304	-37	0.37	0.38	0.19	1.8	108	10	304.1	3	0	0	75	1008	9
6	11	9	313	16	9.3	0.235	-9	-9	-999	262	-125.1	0.37	0.38	0.22	1.8	101	10	302.9	3	0	0	75	1008	10
6	11	9	313	17	0.1	0.146	-9	-9	-999	131	-2810.5	0.37	0.38	0.31	1.2	109	10	300.9	3	0	0	75	1009	3
6	11	9	313	18	-1.8	0.049	-9	-9	-999	32	5.8	0.37	0.38	0.68	0.8	114	10	300.2	3	0	0	88	1009	3
6	11	9	313	19	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	108	10	299.8	3	0	0	88	1010	3
6	11	9	313	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	100	10	299.5	3	0	0	94	1010	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	9	313	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	299.2	3	0	0	94	1011	3
6	11	9	313	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	298.8	3	0	0	94	1011	3
6	11	9	313	23	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	96	10	298.4	3	0	0	94	1011	0
6	11	9	313	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	298.1	3	0	0	94	1010	3
6	11	10	314	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	297.9	3	0	0	100	1010	3
6	11	10	314	2	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	78	10	297.6	3	0	0	100	1009	0
6	11	10	314	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	297.5	3	0	0	100	1009	3
6	11	10	314	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	72	10	297.4	3	0	0	100	1009	3
6	11	10	314	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	96	10	297.4	3	0	0	100	1010	7
6	11	10	314	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	95	10	298.5	3	0	0	100	1010	7
6	11	10	314	7	-4.8	0.091	-9	-9	-999	63	14.3	0.37	0.38	0.5	1.5	87	10	298.9	3	0	0	100	1012	0
6	11	10	314	8	33.3	0.2	0.466	0.005	109	206	-21.7	0.37	0.38	0.26	1.3	94	10	300.2	3	0	0	97	1012	7
6	11	10	314	9	78.7	0.241	0.962	0.005	408	272	-16	0.37	0.38	0.2	1.5	104	10	302.9	3	0	0	70	1013	3
6	11	10	314	10	51.5	0.275	0.897	0.005	506	331	-36.3	0.37	0.38	0.19	1.9	86	10	301.5	3	0	0.76	94	1013	9
6	11	10	314	11	35.9	0.256	0.979	0.006	941	298	-42.1	0.37	0.38	0.19	1.8	102	10	299.1	3	0	0.76	100	1012	10
6	11	10	314	12	36.2	0.212	0.989	0.006	965	226	-23.9	0.37	0.38	0.19	1.4	118	10	299.8	3	0	0	94	1011	10
6	11	10	314	13	57.2	0.223	1.167	0.006	1002	241	-17.4	0.37	0.38	0.19	1.4	133	10	302.4	3	0	0	85	1010	9
6	11	10	314	14	30.8	0.209	0.957	0.006	1022	220	-26.8	0.37	0.38	0.19	1.4	129	10	302.4	3	0	0	72	1009	10
6	11	10	314	15	23	0.182	0.872	0.006	1036	179	-23.6	0.37	0.38	0.19	1.2	124	10	302.1	3	0	0	75	1009	10
6	11	10	314	16	8.8	0.157	0.634	0.006	1041	144	-39.9	0.37	0.38	0.22	1.1	136	10	301.5	3	0	0	85	1009	10
6	11	10	314	17	0.1	0.087	0.143	0.006	1041	60	-582.9	0.37	0.38	0.31	0.7	129	10	300.1	3	0	0	82	1009	10
6	11	10	314	18	-1.6	0.051	-9	-9	-999	27	7.7	0.655	0.64	0.67	0.7	78	10	299.6	3	0	0	88	1009	7
6	11	10	314	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	73	10	299.2	3	0	0	94	1010	7
6	11	10	314	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	85	10	298.9	3	0	0	91	1010	7
6	11	10	314	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298.6	3	0	0	94	1011	7
6	11	10	314	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	72	10	298.2	3	0	0	94	1011	7
6	11	10	314	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	77	10	297.8	3	0	0	97	1011	0
6	11	10	314	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	297.4	3	0	0	94	1010	7
6	11	11	315	1	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	297.4	3	0	0	94	1010	7
6	11	11	315	2	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	89	10	297.4	3	0	0	100	1009	0
6	11	11	315	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	99	10	297	3	0	0	100	1009	7
6	11	11	315	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	297.2	3	0	0	100	1009	7
6	11	11	315	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	81	10	297.2	3	0	0	100	1009	0
6	11	11	315	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	297.4	3	0	0	100	1010	3
6	11	11	315	7	-0.6	0.081	-9	-9	-999	53	77.7	0.37	0.38	0.5	0.8	113	10	298.4	3	0	0	100	1011	7
6	11	11	315	8	9.6	0.126	0.337	0.005	144	103	-18.7	0.37	0.38	0.26	0.8	117	10	299.4	3	0	0	82	1012	10
6	11	11	315	9	30.4	0.154	0.619	0.005	281	139	-10.9	0.37	0.38	0.21	0.9	126	10	300.2	3	0	0	88	1012	9
6	11	11	315	10	76.8	0.229	1.103	0.005	631	252	-14.1	0.37	0.38	0.19	1.4	92	10	302.5	3	0	0	88	1012	8
6	11	11	315	11	49.3	0.262	1.031	0.005	802	309	-33.1	0.37	0.38	0.19	1.8	105	10	301.5	3	0	0	77	1011	9
6	11	11	315	12	78.9	0.252	1.252	0.005	897	292	-18.3	0.37	0.38	0.19	1.6	104	10	303.2	3	0	0	79	1009	9
6	11	11	315	13	78.1	0.273	1.29	0.005	990	329	-23.6	0.37	0.38	0.19	1.8	100	10	304.2	3	0	0	70	1009	9
6	11	11	315	14	26.8	0.229	0.913	0.005	1023	252	-40.1	0.37	0.38	0.19	1.6	93	10	304.8	3	0	0	70	1008	10
6	11	11	315	15	33.4	0.255	0.996	0.005	1061	295	-44.3	0.37	0.38	0.19	1.8	100	10	303.4	3	0	0	66	1008	10
6	11	11	315	16	13.7	0.196	0.743	0.005	1074	200	-49.3	0.37	0.38	0.22	1.4	107	10	301.9	3	0	0	66	1008	10
6	11	11	315	17	0.1	0.158	0.144	0.005	1070	145	-3565.7	0.37	0.38	0.31	1.3	102	10	299.4	3	0	0.25	75	1009	0
6	11	11	315	18	-3	0.067	-9	-9	-999	43	9	0.37	0.38	0.68	1.1	104	10	298.1	3	0	0.25	94	1009	7
6	11	11	315	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	97	10	297.9	3	0	1.27	94	1010	3
6	11	11	315	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	78	10	298	3	0	0	97	1010	7
6	11	11	315	21	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	68	10	298.1	3	0	1.02	94	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	11	315	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	297.9	3	0	0	94	1010	7
6	11	11	315	23	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	98	10	297.8	3	0	0	97	1010	7
6	11	11	315	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	297.8	3	0	0.25	94	1009	7
6	11	12	316	1	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	101	10	297.9	3	0	0	100	1009	3
6	11	12	316	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	94	10	297.5	3	0	0	100	1008	7
6	11	12	316	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	60	10	297.4	3	0	0.25	100	1008	7
6	11	12	316	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	297.4	3	0	0	100	1009	7
6	11	12	316	5	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	78	10	297.4	3	0	0	97	1009	7
6	11	12	316	6	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	87	10	297.5	3	0	0	100	1010	7
6	11	12	316	7	-4.9	0.095	-9	-9	-999	68	16	0.655	0.64	0.49	1.3	77	10	298.2	3	0	0	100	1011	0
6	11	12	316	8	31.2	0.207	0.52	0.005	163	217	-25.7	0.655	0.64	0.26	1.1	73	10	298.6	3	0	0	97	1011	9
6	11	12	316	9	66.4	0.238	0.85	0.005	333	267	-18.2	0.655	0.64	0.2	1.2	71	10	299.6	3	0	0	100	1012	9
6	11	12	316	10	80.1	0.219	1.018	0.005	474	236	-11.9	0.37	0.38	0.19	1.3	92	10	301.4	3	0	0	82	1011	8
6	11	12	316	11	78.8	0.184	1.164	0.005	721	182	-7.2	0.37	0.38	0.19	1	102	10	303.4	3	0	0	77	1010	8
6	11	12	316	12	128.8	0.251	1.442	0.005	839	290	-11.1	0.736	0.77	0.17	1.1	191	10	303.9	3	0	0.25	75	1009	9
6	11	12	316	13	15.3	0.174	0.712	0.005	846	168	-30.9	0.736	0.77	0.17	0.9	152	10	299	3	0	17.53	75	1009	10
6	11	12	316	14	6.7	0.132	0.542	0.005	851	111	-31	0.37	0.38	0.19	0.9	91	10	298.1	3	0	0.76	82	1008	10
6	11	12	316	15	24.4	0.176	0.841	0.005	873	170	-20	0.655	0.64	0.19	0.9	80	10	299.2	3	0	0.25	88	1008	10
6	11	12	316	16	11.6	0.189	0.659	0.005	883	190	-52.4	0.655	0.64	0.21	1.1	83	10	299.6	3	0	0	91	1008	10
6	11	12	316	17	0.1	0.177	0.135	0.005	882	171	-4953.5	0.655	0.64	0.3	1.2	83	10	299.2	3	0	0	85	1009	7
6	11	12	316	18	-4.2	0.079	-9	-9	-999	55	10.6	0.37	0.38	0.68	1.3	97	10	298.6	3	0	0	94	1009	7
6	11	12	316	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	79	10	298.4	3	0	0	88	1010	7
6	11	12	316	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	298.1	3	0	0	91	1010	7
6	11	12	316	21	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	105	10	297.9	3	0	0	94	1010	7
6	11	12	316	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	297.6	3	0	0	88	1010	7
6	11	12	316	23	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	64	10	297.6	3	0	0	94	1010	7
6	11	12	316	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	61	10	297.5	3	0	0	94	1009	7
6	11	13	317	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	297.4	3	0	0	100	1009	7
6	11	13	317	2	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	88	10	297.2	3	0	0	97	1009	7
6	11	13	317	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	297.4	3	0	0	94	1008	7
6	11	13	317	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	119	10	297.6	3	0	0	100	1008	3
6	11	13	317	5	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	140	10	297.9	3	0	0	97	1009	7
6	11	13	317	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	299	3	0	0	94	1010	7
6	11	13	317	7	-1.4	0.049	-9	-9	-999	25	7.4	0.37	0.38	0.5	0.8	111	10	300.2	3	0	0	88	1010	0
6	11	13	317	8	60	0.178	0.925	0.005	475	173	-8.5	0.37	0.38	0.27	1	104	10	303	3	0	0	77	1011	0
6	11	13	317	9	91.3	0.175	1.279	0.005	827	169	-5.3	0.37	0.38	0.21	0.9	87	10	304.6	3	0	0	71	1011	0
6	11	13	317	10	116.8	0.243	1.464	0.005	969	276	-11.1	0.686	0.72	0.15	1.1	245	10	303.5	3	0	0	66	1010	8
6	11	13	317	11	75.2	0.139	1.303	0.005	1061	124	-3.2	0.655	0.64	0.18	0.5	348	10	302.8	3	0	0	64	1010	9
6	11	13	317	12	74.6	0.214	1.336	0.005	1151	227	-11.8	0.655	0.64	0.18	1	21	10	301.4	3	0	1.02	60	1009	10
6	11	13	317	13	48.9	0.244	1.18	0.005	1209	277	-26.6	0.655	0.64	0.18	1.3	25	10	300.6	3	0	0.25	94	1008	10
6	11	13	317	14	2.2	0.171	0.419	0.005	1206	164	-203.9	0.655	0.64	0.18	1.1	71	10	297.5	3	0	13.97	100	1008	10
6	11	13	317	15	7.3	0.117	0.628	0.005	1214	93	-19.8	0.655	0.64	0.19	0.6	72	10	297.1	3	0	1.78	100	1008	10
6	11	13	317	16	16.3	0.155	0.824	0.005	1236	141	-20.7	0.655	0.64	0.21	0.8	74	10	298.4	3	0	0.25	88	1008	10
6	11	13	317	17	0.1	0.11	0.151	0.005	1235	84	-1204.1	0.37	0.38	0.31	0.9	100	10	297.9	3	0	0	91	1008	7
6	11	13	317	18	-2.8	0.061	-9	-9	-999	35	7.2	0.37	0.38	0.68	1	113	10	297.5	3	0	0	100	1008	3
6	11	13	317	19	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	92	10	297.6	3	0	0	100	1009	7
6	11	13	317	20	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	99	10	297.5	3	0	0	100	1009	7
6	11	13	317	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	110	10	297.4	3	0	0	100	1010	7
6	11	13	317	22	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	62	10	297.1	3	0	0	100	1010	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	13	317	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	65	10	296.8	3	0	0	100	1010	7
6	11	13	317	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	296.9	3	0	0	100	1009	3
6	11	14	318	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	73	10	296.9	3	0	0	100	1009	3
6	11	14	318	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	296.9	3	0	0	100	1008	3
6	11	14	318	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	296.8	3	0	0	100	1008	3
6	11	14	318	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	296.5	3	0	0	100	1008	3
6	11	14	318	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	75	10	296.4	3	0	0	100	1009	0
6	11	14	318	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	297.4	3	0	0	100	1009	3
6	11	14	318	7	-2.6	0.067	-9	-9	-999	40	10.1	0.37	0.38	0.51	1.1	93	10	300.6	3	0	0	94	1009	0
6	11	14	318	8	57.5	0.223	-9	-9	-999	242	-17.3	0.37	0.38	0.27	1.4	113	10	302.6	3	0	0	85	1010	0
6	11	14	318	9	86.1	0.21	-9	-9	-999	221	-9.6	0.37	0.38	0.21	1.2	124	10	304.2	3	0	0	80	1010	0
6	11	14	318	10	82.7	0.161	-9	-9	-999	149	-4.6	0.37	0.38	0.19	0.8	130	10	304.9	3	0	0	70	1010	7
6	11	14	318	11	138.1	0.151	-9	-9	-999	135	-2.3	0.655	0.64	0.18	0.5	52	10	305.4	3	0	0	61	1009	8
6	11	14	318	12	79.5	0.256	-9	-9	-999	298	-19	0.655	0.64	0.18	1.3	350	10	303.8	3	0	0	58	1008	9
6	11	14	318	13	24.5	0.241	-9	-9	-999	273	-51.5	0.655	0.64	0.18	1.4	346	10	302.4	3	0	0	56	1007	10
6	11	14	318	14	10.6	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.17	0	0	10	301.5	3	0	5.33	62	1006	10
6	11	14	318	15	0.8	0.11	-9	-9	-999	84	-157.1	0.655	0.64	0.19	0.7	58	10	298.4	3	0	9.65	65	1007	10
6	11	14	318	16	0.1	0.177	-9	-9	-999	171	-4943.6	0.655	0.64	0.21	1.2	3	10	297.4	3	0	8.38	88	1007	10
6	11	14	318	17	0.1	0.09	-9	-9	-999	64	-650.1	0.655	0.64	0.3	0.6	66	10	297.6	3	0	0	94	1007	7
6	11	14	318	18	-1.3	0.044	-9	-9	-999	22	5.7	0.655	0.64	0.68	0.6	75	10	297	3	0	0	88	1007	3
6	11	14	318	19	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	297	3	0	0	88	1008	3
6	11	14	318	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	297.2	3	0	0	97	1008	7
6	11	14	318	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	297.2	3	0	0	94	1008	3
6	11	14	318	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	92	10	297.4	3	0	0	100	1008	3
6	11	14	318	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	87	10	297.2	3	0	0	97	1008	0
6	11	14	318	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	297.1	3	0	0	100	1007	3
6	11	15	319	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	83	10	296.8	3	0	0	100	1007	3
6	11	15	319	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	61	10	296.6	3	0	0	100	1006	3
6	11	15	319	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	92	10	296.8	3	0	0	100	1006	3
6	11	15	319	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	99	10	296.9	3	0	0	100	1006	3
6	11	15	319	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	65	10	296.6	3	0	0	97	1007	7
6	11	15	319	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	80	10	297.9	3	0	0	100	1007	3
6	11	15	319	7	-2.2	0.061	-9	-9	-999	34	9.1	0.37	0.38	0.51	1	88	10	301.1	3	0	0	94	1008	0
6	11	15	319	8	47.3	0.218	0.839	0.005	450	235	-19.8	0.37	0.38	0.27	1.4	111	10	302.9	3	0	0	88	1009	0
6	11	15	319	9	59.4	0.245	1.087	0.005	778	279	-22.3	0.37	0.38	0.21	1.6	115	10	303.1	3	0	0	75	1009	7
6	11	15	319	10	92.4	0.245	1.31	0.006	877	279	-14.3	0.37	0.38	0.19	1.5	126	10	304.4	3	0	0	66	1009	6
6	11	15	319	11	99.7	0.225	1.397	0.007	984	245	-10.2	0.37	0.38	0.19	1.3	110	10	305.4	3	0	0	68	1008	7
6	11	15	319	12	90.7	0.283	1.396	0.007	1079	346	-22.4	0.736	0.77	0.17	1.4	164	10	304.1	3	0	0	66	1008	9
6	11	15	319	13	28	0.239	0.951	0.007	1103	270	-44	0.736	0.77	0.17	1.3	197	10	300.1	3	0	2.54	62	1007	10
6	11	15	319	14	21.3	0.16	0.874	0.007	1125	149	-17.3	0.655	0.64	0.18	0.8	6	10	299.8	3	0	0	65	1007	10
6	11	15	319	15	15.8	0.142	0.793	0.007	1132	123	-16.2	0.655	0.64	0.19	0.7	44	10	299.9	3	0	0	79	1007	10
6	11	15	319	16	17.3	0.156	0.818	0.006	1140	142	-19.9	0.655	0.64	0.21	0.8	69	10	300.4	3	0	0	79	1007	10
6	11	15	319	17	0.1	0.09	0.147	0.006	1139	63	-650.1	0.655	0.64	0.3	0.6	58	10	299.5	3	0	0	75	1007	3
6	11	15	319	18	-1.2	0.044	-9	-9	-999	22	6.5	0.655	0.64	0.68	0.6	77	10	298.9	3	0	0	88	1007	7
6	11	15	319	19	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	298.6	3	0	0	88	1008	3
6	11	15	319	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	298.1	3	0	0	91	1009	3
6	11	15	319	21	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	90	10	297.9	3	0	0	94	1009	3
6	11	15	319	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	297.8	3	0	0	94	1009	3
6	11	15	319	23	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	80	10	297.4	3	0	0	94	1009	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	15	319	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	68	10	297.1	3	0	0	100	1008	3
6	11	16	320	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	82	10	297.1	3	0	0	100	1008	3
6	11	16	320	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	81	10	297	3	0	0	97	1008	7
6	11	16	320	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	101	10	296.9	3	0	0	94	1007	3
6	11	16	320	4	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	86	10	297.2	3	0	0	100	1007	3
6	11	16	320	5	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	84	10	296.9	3	0	0	100	1008	0
6	11	16	320	6	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	83	10	298	3	0	0	94	1008	7
6	11	16	320	7	-1.8	0.055	-9	-9	-999	29	8.1	0.37	0.38	0.51	0.9	96	10	300.8	3	0	0	94	1009	0
6	11	16	320	8	49.4	0.186	1.032	0.005	801	184	-11.7	0.37	0.38	0.27	1.1	92	10	302.8	3	0	0	85	1010	0
6	11	16	320	9	83.5	0.231	1.279	0.005	904	256	-13.3	0.37	0.38	0.21	1.4	114	10	304	3	0	0	75	1010	0
6	11	16	320	10	102.5	0.259	1.431	0.005	1031	303	-15.2	0.37	0.38	0.19	1.6	118	10	305	3	0	0	70	1009	5
6	11	16	320	11	105.9	0.238	1.534	0.005	1227	267	-11.4	0.37	0.38	0.19	1.4	107	10	305.4	3	0	0	66	1009	7
6	11	16	320	12	68.5	0.226	1.346	0.005	1281	248	-15.2	0.37	0.38	0.19	1.4	98	10	305.2	3	0	0	61	1008	9
6	11	16	320	13	43.2	0.29	1.16	0.005	1300	360	-50.9	0.736	0.77	0.17	1.6	179	10	302	3	0	4.32	62	1007	10
6	11	16	320	14	1.1	-9	-9	-9	1298	-999	-99999	0.542	0.56	0.17	0	0	10	299.1	3	0	2.29	91	1007	10
6	11	16	320	15	6.1	0.154	0.604	0.005	1301	139	-54.3	0.655	0.64	0.19	0.9	52	10	298.4	3	0	0.25	88	1007	10
6	11	16	320	16	20.4	0.146	0.906	0.005	1311	128	-13.6	0.655	0.64	0.21	0.7	78	10	299.8	3	0	0	88	1007	10
6	11	16	320	17	0.1	0.118	0.154	0.005	1311	94	-1492.5	0.655	0.64	0.3	0.8	81	10	299.2	3	0	0	88	1007	10
6	11	16	320	18	-1.6	0.051	-9	-9	-999	28	7.6	0.655	0.64	0.68	0.7	83	10	298.8	3	0	0	94	1007	7
6	11	16	320	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	86	10	298.4	3	0	0	94	1008	7
6	11	16	320	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	95	10	298	3	0	0	88	1009	7
6	11	16	320	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	83	10	297.5	3	0	0	94	1009	3
6	11	16	320	22	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	97	10	297.4	3	0	0	100	1009	0
6	11	16	320	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	92	10	297.4	3	0	0	100	1009	0
6	11	16	320	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	72	10	297.1	3	0	0	94	1009	3
6	11	17	321	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	297	3	0	0	100	1008	3
6	11	17	321	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	296.9	3	0	0	100	1008	3
6	11	17	321	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	115	10	296.6	3	0	0	100	1008	3
6	11	17	321	4	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	88	10	296.2	3	0	0	100	1008	7
6	11	17	321	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296	3	0	0	97	1009	7
6	11	17	321	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	297.4	3	0	0	97	1009	7
6	11	17	321	7	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.5	0	0	10	301.2	3	0	0	94	1010	0
6	11	17	321	8	86.8	0.225	-9	-9	-999	246	-11.9	0.736	0.77	0.26	1	155	10	303.1	3	0	0	82	1011	0
6	11	17	321	9	124	0.32	-9	-9	-999	417	-23.9	0.736	0.77	0.2	1.6	161	10	303.9	3	0	0	80	1011	0
6	11	17	321	10	121.7	0.292	-9	-9	-999	364	-18.5	0.736	0.77	0.18	1.4	160	10	303.9	3	0	0	70	1010	8
6	11	17	321	11	118.9	0.249	-9	-9	-999	286	-11.7	0.736	0.77	0.18	1.1	153	10	304.4	3	0	0	79	1010	9
6	11	17	321	12	23.5	0.227	-9	-9	-999	249	-45.1	0.655	0.64	0.18	1.3	54	10	300.4	3	0	0	88	1009	10
6	11	17	321	13	82.2	0.336	-9	-9	-999	447	-41.3	0.655	0.64	0.18	1.9	34	10	298.8	3	0	8.13	94	1009	9
6	11	17	321	14	52.3	0.245	-9	-9	-999	283	-25.4	0.655	0.64	0.18	1.3	53	10	300.4	3	0	0	97	1008	10
6	11	17	321	15	73.7	0.267	-9	-9	-999	318	-23.3	0.655	0.64	0.19	1.4	76	10	301.4	3	0	0	100	1007	9
6	11	17	321	16	8.3	0.157	-9	-9	-999	148	-41.5	0.37	0.38	0.22	1.1	107	10	300.4	3	0	0	85	1007	10
6	11	17	321	17	0.1	0.122	-9	-9	-999	98	-1638.7	0.37	0.38	0.31	1	94	10	299.4	3	0	0	88	1008	7
6	11	17	321	18	-2.1	0.059	-9	-9	-999	34	8.7	0.655	0.64	0.68	0.8	72	10	298.6	3	0	0	94	1008	7
6	11	17	321	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	298	3	0	0	94	1009	7
6	11	17	321	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297.9	3	0	0	94	1010	7
6	11	17	321	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	93	10	297.8	3	0	0	94	1010	7
6	11	17	321	22	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	297.9	3	0	0	100	1010	7
6	11	17	321	23	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	83	10	297.5	3	0	0	100	1010	7
6	11	17	321	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	96	10	297.5	3	0	0	94	1009	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	18	322	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	76	10	297.5	3	0	0	94	1009	7
6	11	18	322	2	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297.2	3	0	0	100	1008	7
6	11	18	322	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	78	10	297.1	3	0	0	100	1008	7
6	11	18	322	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	66	10	297	3	0	0	100	1009	3
6	11	18	322	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	69	10	296.9	3	0	0	94	1009	3
6	11	18	322	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	62	10	297.9	3	0	0	94	1010	7
6	11	18	322	7	-1.8	0.055	-9	-9	-999	29	8	0.37	0.38	0.52	0.9	96	10	301.5	3	0	0	94	1011	0
6	11	18	322	8	56.1	0.254	-9	-9	-999	295	-26.5	0.37	0.38	0.27	1.7	116	10	303.1	3	0	0	88	1012	0
6	11	18	322	9	83.5	0.308	-9	-9	-999	393	-31.5	0.37	0.38	0.21	2.1	136	10	304.1	3	0	0	75	1012	0
6	11	18	322	10	88.6	0.332	-9	-9	-999	439	-37.1	0.37	0.38	0.19	2.3	134	10	304.1	3	0	0	70	1012	7
6	11	18	322	11	120.5	0.401	-9	-9	-999	584	-48.2	0.736	0.77	0.18	2.2	140	10	304	3	0	0	66	1010	8
6	11	18	322	12	61.4	0.278	-9	-9	-999	346	-31.7	0.37	0.38	0.19	1.9	125	10	303.4	3	0	0	88	1009	9
6	11	18	322	13	84.5	0.276	-9	-9	-999	333	-22.4	0.37	0.38	0.19	1.8	132	10	304.8	3	0	0	79	1009	8
6	11	18	322	14	41.6	0.27	-9	-9	-999	322	-42.5	0.37	0.38	0.19	1.9	128	10	304.1	3	0	0	70	1009	10
6	11	18	322	15	38.5	0.29	-9	-9	-999	359	-56.9	0.37	0.38	0.19	2.1	128	10	303.5	3	0	0	70	1008	10
6	11	18	322	16	20	0.245	-9	-9	-999	280	-66.1	0.37	0.38	0.22	1.8	116	10	302.6	3	0	0	70	1009	10
6	11	18	322	17	0.1	0.146	-9	-9	-999	132	-2811.4	0.37	0.38	0.31	1.2	111	10	300.9	3	0	0	79	1009	10
6	11	18	322	18	-1.6	0.049	-9	-9	-999	32	6.6	0.37	0.38	0.68	0.8	105	10	299.8	3	0	0	83	1009	7
6	11	18	322	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	299.4	3	0	0	88	1010	7
6	11	18	322	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	89	10	298.8	3	0	0	91	1010	0
6	11	18	322	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298.2	3	0	0	88	1010	7
6	11	18	322	22	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	298.2	3	0	0	88	1010	7
6	11	18	322	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	97	10	298.1	3	0	0	88	1010	7
6	11	18	322	24	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	108	10	298.2	3	0	0	88	1010	7
6	11	19	323	1	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	100	10	298.4	3	0	0	88	1009	7
6	11	19	323	2	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	98	10	298.1	3	0	0	100	1009	7
6	11	19	323	3	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	297.8	3	0	0	100	1009	7
6	11	19	323	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	297.4	3	0	0	100	1009	7
6	11	19	323	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	81	10	297.2	3	0	0	100	1009	7
6	11	19	323	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	53	10	298.4	3	0	0	100	1010	7
6	11	19	323	7	-3.3	0.073	-9	-9	-999	45	10.5	0.37	0.38	0.53	1.2	113	10	301.8	3	0	0	88	1011	0
6	11	19	323	8	56	0.298	0.714	0.005	235	374	-42.7	0.37	0.38	0.27	2.1	125	10	303	3	0	0	82	1013	0
6	11	19	323	9	87.1	0.298	1.089	0.005	536	374	-27.5	0.37	0.38	0.21	2	130	10	304	3	0	0	70	1013	0
6	11	19	323	10	98.7	0.28	1.336	0.007	873	341	-20.1	0.37	0.38	0.19	1.8	122	10	304.8	3	0	0	66	1013	6
6	11	19	323	11	104.6	0.293	1.398	0.007	943	364	-21.6	0.37	0.38	0.19	1.9	128	10	305.2	3	0	0	66	1013	7
6	11	19	323	12	121.4	0.286	1.51	0.006	1026	352	-17.4	0.37	0.38	0.19	1.8	135	10	306	3	0	0	62	1012	6
6	11	19	323	13	96.4	0.269	1.428	0.006	1090	320	-18.1	0.37	0.38	0.19	1.7	126	10	306	3	0	0	66	1011	8
6	11	19	323	14	43.6	0.26	1.106	0.005	1119	305	-36.4	0.37	0.38	0.19	1.8	126	10	305.9	3	0	0	70	1010	10
6	11	19	323	15	50.1	0.296	1.169	0.005	1151	369	-46.4	0.37	0.38	0.19	2.1	124	10	304.6	3	0	0	61	1010	9
6	11	19	323	16	17.9	0.254	0.832	0.005	1161	295	-82.8	0.37	0.38	0.22	1.9	118	10	303.2	3	0	0	61	1010	10
6	11	19	323	17	0.1	0.182	0.148	0.005	1158	181	-5464.5	0.37	0.38	0.31	1.5	114	10	300.9	3	0	0	74	1010	3
6	11	19	323	18	-3.4	0.067	-9	-9	-999	49	7.9	0.37	0.38	0.68	1.1	106	10	299.4	3	0	0	82	1010	3
6	11	19	323	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	105	10	298.9	3	0	0	88	1010	3
6	11	19	323	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	298.5	3	0	0	91	1011	3
6	11	19	323	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	297.9	3	0	0	88	1011	3
6	11	19	323	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	297.9	3	0	0	88	1011	3
6	11	19	323	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	61	10	297.5	3	0	0	97	1011	0
6	11	19	323	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	52	10	297.4	3	0	0	100	1011	7
6	11	20	324	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	66	10	297.2	3	0	0	100	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	20	324	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	67	10	297	3	0	0	100	1010	3
6	11	20	324	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	75	10	296.9	3	0	0	100	1010	3
6	11	20	324	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	78	10	296.9	3	0	0	100	1010	3
6	11	20	324	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	74	10	296.8	3	0	0	100	1011	0
6	11	20	324	6	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	58	10	297.6	3	0	0	100	1012	3
6	11	20	324	7	-1.5	0.051	-9	-9	-999	27	8	0.655	0.64	0.52	0.7	81	10	301.4	3	0	0	94	1013	0
6	11	20	324	8	56	0.188	0.79	0.005	318	188	-10.8	0.37	0.38	0.27	1.1	104	10	303.4	3	0	0	82	1014	0
6	11	20	324	9	73.5	0.239	1.017	0.005	518	269	-16.9	0.37	0.38	0.21	1.5	108	10	303.9	3	0	0	75	1014	0
6	11	20	324	10	110.8	0.294	1.371	0.005	841	367	-20.8	0.37	0.38	0.19	1.9	123	10	305.1	3	0	0	66	1014	0
6	11	20	324	11	124.6	0.264	1.477	0.005	936	312	-13.3	0.37	0.38	0.19	1.6	117	10	305.8	3	0	0	59	1013	4
6	11	20	324	12	118.8	0.285	1.5	0.005	1026	351	-17.7	0.37	0.38	0.19	1.8	117	10	305.9	3	0	0	56	1012	6
6	11	20	324	13	84.7	0.265	1.367	0.005	1090	314	-19.8	0.37	0.38	0.19	1.7	111	10	305.2	3	0	0	56	1012	8
6	11	20	324	14	45.9	0.261	1.127	0.005	1125	307	-34.9	0.37	0.38	0.19	1.8	112	10	305.5	3	0	0	59	1011	10
6	11	20	324	15	47.7	0.273	1.153	0.005	1160	328	-38.4	0.37	0.38	0.19	1.9	108	10	304.9	3	0	0	61	1010	9
6	11	20	324	16	21.6	0.225	0.89	0.005	1174	246	-47.3	0.37	0.38	0.22	1.6	108	10	303.5	3	0	0	61	1010	10
6	11	20	324	17	0.1	0.134	0.148	0.005	1171	116	-2175.3	0.37	0.38	0.31	1.1	104	10	301.2	3	0	0	70	1010	3
6	11	20	324	18	-2.3	0.055	-9	-9	-999	32	6.5	0.37	0.38	0.68	0.9	95	10	300.1	3	0	0	82	1010	3
6	11	20	324	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	72	10	299.4	3	0	0	82	1011	3
6	11	20	324	20	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	298.9	3	0	0	88	1011	3
6	11	20	324	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	93	10	298.4	3	0	0	94	1012	3
6	11	20	324	22	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	77	10	298	3	0	0	94	1011	3
6	11	20	324	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	79	10	297.9	3	0	0	97	1011	3
6	11	20	324	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	56	10	297.6	3	0	0	94	1010	3
6	11	21	325	1	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	84	10	297.8	3	0	1.02	100	1010	3
6	11	21	325	2	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	72	10	297.4	3	0	0	97	1010	7
6	11	21	325	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	52	10	297.1	3	0	0	100	1010	7
6	11	21	325	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	296.8	3	0	0	94	1010	3
6	11	21	325	5	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	93	10	296.9	3	0	0	100	1011	0
6	11	21	325	6	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	297.2	3	0	0	100	1012	7
6	11	21	325	7	-1.9	0.061	-9	-9	-999	34	10.7	0.37	0.38	0.53	1	93	10	297.9	3	0	0	100	1012	5
6	11	21	325	8	49.2	0.217	0.55	0.005	122	232	-18.8	0.655	0.64	0.27	1.1	83	10	299.8	3	0	0	94	1013	4
6	11	21	325	9	82.6	0.253	0.891	0.005	309	293	-17.8	0.37	0.38	0.21	1.6	90	10	302.4	3	0	0	82	1014	0
6	11	21	325	10	97.9	0.257	1.157	0.005	571	300	-15.8	0.37	0.38	0.19	1.6	100	10	303	3	0	0	80	1014	6
6	11	21	325	11	25.6	0.292	0.792	0.005	700	362	-87.7	0.736	0.77	0.18	1.7	144	10	299.5	3	0	7.62	72	1014	10
6	11	21	325	12	61.3	0.213	1.096	0.005	775	228	-14.1	0.37	0.38	0.19	1.3	133	10	300	3	0	0	75	1012	9
6	11	21	325	13	100.3	0.258	1.351	0.005	887	302	-15.5	0.37	0.38	0.19	1.6	127	10	303.6	3	0	0	80	1011	7
6	11	21	325	14	27.2	0.218	0.884	0.005	915	234	-34.3	0.37	0.38	0.19	1.5	121	10	302.8	3	0	0	75	1010	10
6	11	21	325	15	12.2	0.194	0.679	0.005	924	197	-54	0.37	0.38	0.19	1.4	122	10	299.9	3	0	0.51	82	1010	10
6	11	21	325	16	1.8	0.131	0.357	0.005	924	110	-114.8	0.37	0.38	0.22	1	136	10	298.9	3	0	0	82	1010	10
6	11	21	325	17	0.1	0.11	0.137	0.005	923	84	-1206.9	0.37	0.38	0.31	0.9	94	10	298.4	3	0	0	91	1011	7
6	11	21	325	18	-1.2	0.044	-9	-9	-999	23	6.5	0.655	0.64	0.67	0.6	74	10	297.8	3	0	0	94	1010	7
6	11	21	325	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	53	10	297.2	3	0	0.25	94	1011	3
6	11	21	325	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	102	10	296.9	3	0	0	97	1011	7
6	11	21	325	21	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.9	3	0	0	100	1012	7
6	11	21	325	22	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	108	10	296.9	3	0	0	100	1012	3
6	11	21	325	23	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	97	10	296.9	3	0	0	100	1011	3
6	11	21	325	24	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	98	10	296.9	3	0	0	100	1011	3
6	11	22	326	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	296.8	3	0	0	100	1010	3
6	11	22	326	2	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	104	10	296.6	3	0	0	100	1009	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	22	326	3	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	88	10	296.6	3	0	0	100	1009	3
6	11	22	326	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	296.8	3	0	0	100	1010	3
6	11	22	326	5	-2	0.054	-9	-9	-999	29	7	0.736	0.77	1	0.7	144	10	296.5	3	0	0	100	1010	3
6	11	22	326	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	132	10	297	3	0	0	100	1011	3
6	11	22	326	7	-1.2	0.042	-9	-9	-999	20	5.7	0.37	0.38	0.54	0.7	119	10	297.9	3	0	0	100	1011	0
6	11	22	326	8	30.6	0.167	0.459	0.006	114	156	-13.6	0.655	0.64	0.27	0.8	72	10	299.1	3	0	0	97	1012	8
6	11	22	326	9	70.4	0.234	0.756	0.005	221	261	-16.5	0.736	0.77	0.2	1.1	141	10	301	3	0	0	79	1013	9
6	11	22	326	10	58.5	0.271	0.78	0.005	293	324	-30.6	0.736	0.77	0.18	1.4	140	10	301.4	3	0	0	80	1013	10
6	11	22	326	11	55.8	0.222	0.889	0.005	454	241	-17.7	0.37	0.38	0.19	1.4	116	10	302.2	3	0	0	85	1012	9
6	11	22	326	12	54.8	0.21	1.086	0.005	844	222	-15.3	0.37	0.38	0.19	1.3	107	10	302.6	3	0	0	75	1011	9
6	11	22	326	13	53.7	0.221	1.112	0.005	925	239	-18.1	0.37	0.38	0.19	1.4	114	10	303	3	0	0	70	1011	9
6	11	22	326	14	55	0.243	1.137	0.005	964	276	-23.5	0.37	0.38	0.19	1.6	106	10	303.4	3	0	0	80	1010	9
6	11	22	326	15	38.2	0.246	1.017	0.005	991	281	-35.3	0.37	0.38	0.19	1.7	96	10	302.9	3	0	0	80	1010	10
6	11	22	326	16	12.6	0.205	0.705	0.005	999	214	-61.9	0.37	0.38	0.22	1.5	101	10	302.1	3	0	0	80	1009	10
6	11	22	326	17	0.1	0.122	0.141	0.005	998	100	-1641.4	0.37	0.38	0.31	1	87	10	300.6	3	0	0	75	1009	10
6	11	22	326	18	-3	0.067	-9	-9	-999	40	9	0.37	0.38	0.68	1.1	92	10	299.4	3	0	0	82	1010	7
6	11	22	326	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	80	10	298.5	3	0	0	88	1010	7
6	11	22	326	20	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	81	10	298.1	3	0	0	94	1010	0
6	11	22	326	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	109	10	297.8	3	0	0	94	1010	7
6	11	22	326	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	84	10	297.4	3	0	0	94	1010	7
6	11	22	326	23	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	72	10	297.1	3	0	0	97	1009	0
6	11	22	326	24	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	102	10	297	3	0	0	100	1009	3
6	11	23	327	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	297	3	0	0	100	1008	3
6	11	23	327	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	67	10	296.9	3	0	0	100	1008	3
6	11	23	327	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	296.9	3	0	0	100	1008	3
6	11	23	327	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	64	10	296.6	3	0	0	100	1008	7
6	11	23	327	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	55	10	296.5	3	0	0	100	1008	0
6	11	23	327	6	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	102	10	296.9	3	0	0	100	1009	7
6	11	23	327	7	-1.6	0.049	-9	-9	-999	25	6.5	0.37	0.38	0.54	0.8	97	10	298.8	3	0	0	100	1009	0
6	11	23	327	8	36	0.191	0.528	0.005	147	192	-17.4	0.37	0.38	0.28	1.2	93	10	301.5	3	0	0	97	1010	0
6	11	23	327	9	52.9	0.232	0.779	0.005	323	256	-21.2	0.37	0.38	0.21	1.5	105	10	302.4	3	0	0	88	1011	8
6	11	23	327	10	77	0.218	1.158	0.005	727	235	-12.2	0.37	0.38	0.19	1.3	128	10	303.4	3	0	0	80	1010	8
6	11	23	327	11	106.8	0.238	1.332	0.005	798	267	-11.3	0.37	0.38	0.19	1.4	128	10	304.5	3	0	0	75	1010	7
6	11	23	327	12	110.9	0.272	1.393	0.005	879	326	-16.4	0.37	0.38	0.19	1.7	104	10	305	3	0	0	66	1010	7
6	11	23	327	13	41.3	0.259	1.018	0.005	919	303	-37.8	0.37	0.38	0.19	1.8	100	10	303.2	3	0	0	63	1009	10
6	11	23	327	14	20.6	0.224	0.814	0.005	939	244	-49	0.37	0.38	0.19	1.6	108	10	302	3	0	0	63	1008	10
6	11	23	327	15	12.7	0.184	0.695	0.005	951	182	-44.1	0.37	0.38	0.19	1.3	105	10	301.2	3	0	0	74	1008	10
6	11	23	327	16	6.1	0.131	0.546	0.005	957	110	-33.3	0.37	0.38	0.22	0.9	87	10	300.9	3	0	0	79	1008	10
6	11	23	327	17	0.1	0.11	0.139	0.005	956	84	-1203.7	0.37	0.38	0.31	0.9	102	10	300	3	0	0	77	1008	7
6	11	23	327	18	-2.1	0.059	-9	-9	-999	33	8.7	0.655	0.64	0.67	0.8	80	10	298.9	3	0	0	82	1008	7
6	11	23	327	19	-6.6	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	85	10	298.4	3	0	0	88	1008	7
6	11	23	327	20	-6.6	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	84	10	297.5	3	0	0	91	1008	7
6	11	23	327	21	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	93	10	297	3	0	0	85	1008	7
6	11	23	327	22	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	104	10	296.9	3	0	0	94	1008	7
6	11	23	327	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	57	10	296.8	3	0	0	97	1008	0
6	11	23	327	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	34	10	296	3	0	0	100	1008	7
6	11	24	328	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	83	10	295.9	3	0	0	100	1007	7
6	11	24	328	2	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	82	10	296	3	0	0	100	1007	0
6	11	24	328	3	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	295.9	3	0	0	97	1007	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	24	328	4	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	132	10	295.9	3	0	0	97	1007	7
6	11	24	328	5	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	98	10	296.4	3	0	0	97	1007	7
6	11	24	328	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	296.9	3	0	0	97	1008	7
6	11	24	328	7	-0.9	0.036	-9	-9	-999	16	4.9	0.37	0.38	0.55	0.6	115	10	300.5	3	0	0	97	1009	0
6	11	24	328	8	36	0.168	0.524	0.005	144	159	-11.9	0.37	0.38	0.28	1	99	10	301.9	3	0	0	94	1010	0
6	11	24	328	9	54	0.164	0.732	0.005	262	153	-7.4	0.37	0.38	0.21	0.9	120	10	302.1	3	0	0	94	1009	8
6	11	24	328	10	58.1	0.15	0.85	0.005	380	134	-5.3	0.655	0.64	0.18	0.6	349	10	302	3	0	0	85	1009	9
6	11	24	328	11	30.6	0.193	0.721	0.005	441	196	-21.3	0.655	0.64	0.18	1	359	10	300.4	3	0	5.08	70	1009	10
6	11	24	328	12	113.2	0.18	1.283	0.005	671	176	-4.6	0.655	0.64	0.18	0.7	345	10	302.8	3	0	0.25	70	1007	9
6	11	24	328	13	97.3	-9	-9	-9	821	-999	-99999	0.542	0.56	0.17	0	0	10	303.9	3	0	0	66	1007	9
6	11	24	328	14	47.8	0.113	1.054	0.005	879	87	-2.7	0.37	0.38	0.19	0.5	124	10	304.4	3	0	0	66	1006	9
6	11	24	328	15	32.7	-9	-9	-9	915	-999	-99999	0.542	0.56	0.17	0	0	10	302.8	3	0	0	70	1006	10
6	11	24	328	16	21.6	0.214	0.828	0.005	942	228	-40.7	0.37	0.38	0.22	1.5	134	10	303.5	3	0	0	61	1006	10
6	11	24	328	17	0.1	0.158	0.138	0.005	937	145	-3558.6	0.37	0.38	0.31	1.3	117	10	300.9	3	0	0	70	1007	3
6	11	24	328	18	-2.8	0.061	-9	-9	-999	40	7.2	0.37	0.38	0.68	1	98	10	299.4	3	0	0	77	1007	3
6	11	24	328	19	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	1	1	85	10	298.8	3	0	0	88	1008	3
6	11	24	328	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	97	10	298.1	3	0	0	85	1009	0
6	11	24	328	21	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	95	10	297.8	3	0	0	88	1009	3
6	11	24	328	22	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	92	10	297.6	3	0	0	94	1009	0
6	11	24	328	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	68	10	297.2	3	0	0	94	1009	0
6	11	24	328	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	296.9	3	0	0	94	1008	3
6	11	25	329	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	88	10	297.1	3	0	0	100	1008	3
6	11	25	329	2	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	86	10	297	3	0	0	94	1008	0
6	11	25	329	3	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	90	10	296.9	3	0	0	100	1007	0
6	11	25	329	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	97	10	297	3	0	0	100	1008	3
6	11	25	329	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	83	10	297	3	0	0	97	1008	0
6	11	25	329	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	298.2	3	0	0	100	1009	3
6	11	25	329	7	-4	0.081	-9	-9	-999	53	12	0.655	0.64	0.54	1.1	85	10	301.1	3	0	0	94	1010	0
6	11	25	329	8	49.6	0.219	0.778	0.005	342	236	-19.2	0.37	0.38	0.28	1.4	108	10	302.8	3	0	0	82	1010	0
6	11	25	329	9	87.9	0.277	1.21	0.005	727	335	-21.8	0.37	0.38	0.21	1.8	125	10	303.9	3	0	0	80	1010	0
6	11	25	329	10	74.9	0.24	1.203	0.005	839	270	-16.6	0.37	0.38	0.19	1.5	115	10	304.4	3	0	0	75	1010	8
6	11	25	329	11	199.8	0.265	1.819	0.007	1087	314	-8.4	0.736	0.77	0.18	1.1	140	10	306.4	3	0	0	65	1009	3
6	11	25	329	12	63.6	0.156	1.261	0.007	1133	146	-5.3	0.37	0.38	0.19	0.8	134	10	305.8	3	0	0	66	1008	9
6	11	25	329	13	19.1	-9	-9	-9	1143	-999	-99999	0.542	0.56	0.17	0	0	10	301.8	3	0	5.08	66	1008	10
6	11	25	329	14	40	0.212	1.092	0.007	1172	225	-21.5	0.655	0.64	0.18	1.1	6	10	301	3	0	0.25	66	1007	10
6	11	25	329	15	27.4	0.207	0.97	0.008	1196	217	-29.1	0.37	0.38	0.19	1.4	113	10	303.9	3	0	0	70	1006	10
6	11	25	329	16	17.6	0.232	0.84	0.007	1207	257	-63.6	0.37	0.38	0.22	1.7	121	10	302.8	3	0	0	70	1007	10
6	11	25	329	17	0.1	0.182	0.15	0.007	1205	180	-5449.9	0.37	0.38	0.31	1.5	120	10	301	3	0	0	77	1007	10
6	11	25	329	18	-2.9	0.067	-9	-9	-999	49	9.1	0.37	0.38	0.68	1.1	112	10	299.9	3	0	0	85	1008	7
6	11	25	329	19	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	96	10	299.4	3	0	0	88	1008	7
6	11	25	329	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	73	10	299.1	3	0	0	91	1009	0
6	11	25	329	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	66	10	298.6	3	0	0	88	1009	7
6	11	25	329	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	79	10	298.2	3	0	0	94	1009	7
6	11	25	329	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	101	10	298	3	0	0	94	1009	0
6	11	25	329	24	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	118	10	297.9	3	0	0	100	1009	3
6	11	26	330	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	297.8	3	0	0	100	1009	3
6	11	26	330	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.5	3	0	0	94	1008	0
6	11	26	330	3	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.4	3	0	0	94	1008	3
6	11	26	330	4	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	125	10	297	3	0	0	100	1009	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	26	330	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	137	10	296.9	3	0	0	100	1009	3
6	11	26	330	6	-1.8	0.054	-9	-9	-999	29	7.9	0.736	0.77	1	0.7	142	10	298.6	3	0	0	100	1010	7
6	11	26	330	7	-3.5	0.077	-9	-9	-999	49	11.5	0.736	0.77	0.54	1	142	10	301.5	3	0	0	94	1010	0
6	11	26	330	8	51.8	0.242	0.644	0.005	185	273	-24.6	0.37	0.38	0.28	1.6	127	10	303	3	0	0	82	1011	0
6	11	26	330	9	73.3	0.261	0.912	0.005	373	307	-21.9	0.37	0.38	0.21	1.7	125	10	304	3	0	0	80	1012	0
6	11	26	330	10	91	0.267	1.153	0.006	608	317	-18.8	0.37	0.38	0.19	1.7	130	10	304.6	3	0	0	75	1011	6
6	11	26	330	11	59.7	0.256	1.078	0.006	756	298	-25.3	0.37	0.38	0.19	1.7	134	10	302.6	3	0	0.51	70	1010	9
6	11	26	330	12	88.5	0.198	1.266	0.006	826	204	-7.9	0.37	0.38	0.19	1.1	98	10	302.4	3	0	0.76	62	1010	8
6	11	26	330	13	92	0.267	1.312	0.006	883	318	-18.7	0.37	0.38	0.19	1.7	127	10	304.9	3	0	0	62	1008	8
6	11	26	330	14	39	0.236	0.995	0.006	906	264	-30.2	0.37	0.38	0.19	1.6	116	10	304.1	3	0	0	62	1008	10
6	11	26	330	15	28.8	0.252	0.904	0.006	924	290	-49.8	0.37	0.38	0.19	1.8	114	10	304.1	3	0	0	66	1008	10
6	11	26	330	16	18.6	0.244	0.785	0.006	933	277	-70.1	0.37	0.38	0.22	1.8	105	10	302.1	3	0	0	80	1008	10
6	11	26	330	17	0.1	0.17	0.138	0.006	931	163	-4443.3	0.37	0.38	0.31	1.4	103	10	300.5	3	0	0	82	1009	10
6	11	26	330	18	-2.9	0.067	-9	-9	-999	46	9.1	0.37	0.38	0.68	1.1	99	10	299.6	3	0	0	82	1009	7
6	11	26	330	19	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	100	10	299.2	3	0	0	94	1009	7
6	11	26	330	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	87	10	298.9	3	0	0	94	1009	0
6	11	26	330	21	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	298.5	3	0	0	94	1010	3
6	11	26	330	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	77	10	298.4	3	0	0	94	1010	3
6	11	26	330	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	70	10	297.9	3	0	0	94	1009	3
6	11	26	330	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	63	10	297.8	3	0	0	94	1009	3
6	11	27	331	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	297.5	3	0	0	94	1009	3
6	11	27	331	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	297.5	3	0	0	97	1008	3
6	11	27	331	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	297.5	3	0	0	100	1008	3
6	11	27	331	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	297.6	3	0	0	100	1008	3
6	11	27	331	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	64	10	297.4	3	0	0.51	100	1009	3
6	11	27	331	6	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	297.4	3	0	0	100	1009	7
6	11	27	331	7	14.4	-9	-9	-9	-999	-999	-99999	0.542	0.56	0.54	0	0	10	298.9	3	0	0	100	1010	0
6	11	27	331	8	30	0.154	0.535	0.006	184	139	-10.9	0.37	0.38	0.28	0.9	109	10	301.4	3	0	0	85	1011	0
6	11	27	331	9	67.2	0.181	0.861	0.006	343	176	-7.9	0.37	0.38	0.21	1	97	10	302.8	3	0	0	85	1010	5
6	11	27	331	10	99.2	0.236	1.165	0.005	575	263	-11.9	0.37	0.38	0.19	1.4	92	10	303.8	3	0	0	80	1010	4
6	11	27	331	11	144.4	0.26	1.392	0.005	673	305	-10.9	0.655	0.64	0.18	1.2	70	10	304.4	3	0	0	82	1009	7
6	11	27	331	12	148.7	0.315	1.56	0.005	920	407	-18.9	0.655	0.64	0.18	1.6	85	10	305	3	0	0	70	1008	7
6	11	27	331	13	83.3	0.286	1.343	0.006	1045	352	-25.3	0.37	0.38	0.19	1.9	90	10	304.9	3	0	0	62	1007	8
6	11	27	331	14	54	0.265	1.176	0.006	1081	313	-30.8	0.37	0.38	0.19	1.8	94	10	304.1	3	0	0	66	1006	9
6	11	27	331	15	36.7	0.289	1.041	0.005	1104	357	-58.8	0.37	0.38	0.19	2.1	94	10	302.4	3	0	1.27	80	1007	10
6	11	27	331	16	9.5	0.191	0.665	0.005	1107	195	-65.4	0.37	0.38	0.22	1.4	103	10	300.4	3	0	0	70	1007	10
6	11	27	331	17	0.1	0.134	0.146	0.005	1106	114	-2169.6	0.37	0.38	0.31	1.1	101	10	299.6	3	0	0	85	1007	7
6	11	27	331	18	-2.9	0.067	-9	-9	-999	41	9.1	0.37	0.38	0.67	1.1	86	10	298.9	3	0	0	82	1008	7
6	11	27	331	19	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	85	10	298.8	3	0	0	88	1008	7
6	11	27	331	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	86	10	298.4	3	0	0	88	1008	0
6	11	27	331	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	79	10	298.2	3	0	0	88	1008	3
6	11	27	331	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	89	10	298.1	3	0	0	88	1009	3
6	11	27	331	23	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	69	10	297.9	3	0	0	97	1008	0
6	11	27	331	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	297.5	3	0	0	94	1008	3
6	11	28	332	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	297.4	3	0	0	94	1007	3
6	11	28	332	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	79	10	297.2	3	0	0	97	1007	3
6	11	28	332	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	94	10	297.4	3	0	0	100	1007	3
6	11	28	332	4	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	60	10	297.4	3	0	0	100	1007	3
6	11	28	332	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	62	10	297	3	0	0	100	1008	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	28	332	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	298.5	3	0	0.51	100	1008	3
6	11	28	332	7	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	0.56	0.8	99	10	301.4	3	0	0	100	1009	0
6	11	28	332	8	49.3	0.208	0.765	0.005	327	218	-16.4	0.37	0.38	0.28	1.3	110	10	302.9	3	0	0	91	1010	0
6	11	28	332	9	70.4	0.26	1.065	0.005	619	305	-22.5	0.37	0.38	0.21	1.7	123	10	303.2	3	0	0	80	1010	0
6	11	28	332	10	93.2	0.256	1.275	0.006	801	298	-16.3	0.37	0.38	0.19	1.6	137	10	303.9	3	0	0	70	1009	6
6	11	28	332	11	104.2	0.303	1.36	0.006	870	384	-24	0.37	0.38	0.19	2	122	10	304.5	3	0	0.51	72	1009	7
6	11	28	332	12	17.6	0.19	0.755	0.006	878	195	-34.8	0.736	0.77	0.18	1	148	10	299.5	3	0	11.18	88	1008	10
6	11	28	332	13	3	0.092	0.42	0.006	880	68	-22.9	0.37	0.38	0.19	0.6	138	10	298.4	3	0	6.6	88	1007	10
6	11	28	332	14	11.9	0.15	0.666	0.006	888	134	-25.6	0.37	0.38	0.19	1	113	10	298.8	3	0	1.27	88	1007	10
6	11	28	332	15	26	0.151	0.869	0.006	906	136	-12	0.37	0.38	0.19	0.9	117	10	300.1	3	0	0	94	1006	10
6	11	28	332	16	9.6	0.115	0.624	0.006	913	89	-14.1	0.37	0.38	0.22	0.7	107	10	300.5	3	0	0	88	1007	10
6	11	28	332	17	0.1	0.104	0.137	0.006	912	77	-1012.4	0.655	0.64	0.3	0.7	71	10	299.6	3	0	0	88	1007	10
6	11	28	332	18	-1.6	0.051	-9	-9	-999	27	7.7	0.655	0.64	0.67	0.7	61	10	298.8	3	0	0	94	1008	7
6	11	28	332	19	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	81	10	298.5	3	0	0	94	1008	7
6	11	28	332	20	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	298.2	3	0	0	94	1009	7
6	11	28	332	21	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	297.9	3	0	0	88	1009	7
6	11	28	332	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	97	10	297.6	3	0	0	94	1009	7
6	11	28	332	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	98	10	297.6	3	0	0	97	1009	7
6	11	28	332	24	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	88	10	297.4	3	0	0	100	1009	7
6	11	29	333	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	53	10	297	3	0	0	100	1008	7
6	11	29	333	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	297	3	0	0	100	1008	7
6	11	29	333	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	93	10	297	3	0	0	100	1008	7
6	11	29	333	4	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	297	3	0	0	100	1008	7
6	11	29	333	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	81	10	297	3	0	0	100	1008	7
6	11	29	333	6	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	297.8	3	0	0	100	1009	7
6	11	29	333	7	-2.6	0.061	-9	-9	-999	34	7.8	0.37	0.38	0.57	1	94	10	300.9	3	0	0	94	1010	0
6	11	29	333	8	59.1	0.234	0.629	0.005	152	261	-19.6	0.37	0.38	0.28	1.5	121	10	302.9	3	0	0	91	1011	0
6	11	29	333	9	66.2	0.269	0.824	0.005	305	321	-26.6	0.37	0.38	0.21	1.8	112	10	303.4	3	0	0	75	1011	6
6	11	29	333	10	95.7	0.29	1.248	0.006	732	359	-23	0.37	0.38	0.19	1.9	116	10	304.2	3	0	0	70	1010	5
6	11	29	333	11	94.2	0.3	1.276	0.006	795	378	-25.9	0.37	0.38	0.19	2	121	10	304.5	3	0	0	68	1010	7
6	11	29	333	12	121	0.318	1.435	0.006	879	413	-24	0.37	0.38	0.19	2.1	132	10	305.4	3	0	0	66	1009	6
6	11	29	333	13	98.5	0.302	1.374	0.006	948	381	-25	0.37	0.38	0.19	2	124	10	305.2	3	0	0	61	1008	8
6	11	29	333	14	69.4	0.292	1.243	0.006	995	364	-32.4	0.37	0.38	0.19	2	125	10	304.9	3	0	0	56	1008	9
6	11	29	333	15	28.6	0.252	0.931	0.006	1014	291	-49.9	0.37	0.38	0.19	1.8	105	10	303.9	3	0	0	61	1007	10
6	11	29	333	16	15.1	0.23	0.754	0.006	1022	253	-72.4	0.37	0.38	0.22	1.7	104	10	302.4	3	0	0	65	1008	10
6	11	29	333	17	0.1	0.146	0.142	0.006	1019	131	-2808.6	0.37	0.38	0.31	1.2	93	10	300.8	3	0	0	75	1008	7
6	11	29	333	18	-2.8	0.061	-9	-9	-999	38	7.3	0.37	0.38	0.67	1	92	10	299.5	3	0	0	82	1009	3
6	11	29	333	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	114	10	298.6	3	0	0	82	1009	3
6	11	29	333	20	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	83	10	298.4	3	0	0	88	1010	3
6	11	29	333	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	61	10	298.2	3	0	0	94	1011	3
6	11	29	333	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	298.1	3	0	0	100	1010	3
6	11	29	333	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	297.6	3	0	0	94	1010	3
6	11	29	333	24	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	107	10	297.4	3	0	0	94	1009	3
6	11	30	334	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	138	10	297.4	3	0	0	100	1009	3
6	11	30	334	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.4	3	0	0	100	1009	3
6	11	30	334	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	48	10	297	3	0	0	100	1009	3
6	11	30	334	4	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	71	10	296.8	3	0	0	100	1009	3
6	11	30	334	5	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	103	10	296.8	3	0	0	100	1009	3
6	11	30	334	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	297.8	3	0	0	100	1010	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	11	30	334	7	-3.4	0.073	-9	-9	-999	46	10.3	0.655	0.64	0.56	1	76	10	300.4	3	0	0	100	1011	0
6	11	30	334	8	78.5	0.269	0.865	0.005	298	321	-22.3	0.655	0.64	0.28	1.4	66	10	302.4	3	0	0	88	1012	0
6	11	30	334	9	118.6	0.308	1.219	0.005	551	392	-22.1	0.655	0.64	0.2	1.6	82	10	302.9	3	0	0	94	1012	0
6	11	30	334	10	93.2	0.268	1.248	0.005	752	319	-18.5	0.37	0.38	0.19	1.7	103	10	304	3	0	0	83	1012	6
6	11	30	334	11	89.1	0.288	1.351	0.005	998	355	-24.1	0.37	0.38	0.19	1.9	102	10	304.4	3	0	0	72	1011	8
6	11	30	334	12	117	0.317	1.525	0.005	1093	411	-24.6	0.37	0.38	0.19	2.1	105	10	304.9	3	0	0	61	1010	6
6	11	30	334	13	92	0.278	1.44	0.005	1168	338	-21	0.37	0.38	0.19	1.8	99	10	304.9	3	0	0	59	1009	8
6	11	30	334	14	66.8	0.303	1.314	0.005	1222	383	-37.3	0.37	0.38	0.19	2.1	112	10	304.8	3	0	0	57	1008	9
6	11	30	334	15	33.7	0.265	1.053	0.005	1248	315	-49.9	0.37	0.38	0.19	1.9	109	10	304	3	0	0	61	1008	10
6	11	30	334	16	20.1	0.224	0.89	0.005	1262	244	-50	0.37	0.38	0.22	1.6	97	10	302.9	3	0	0	65	1008	10
6	11	30	334	17	0.1	0.134	0.152	0.005	1259	116	-2171	0.37	0.38	0.31	1.1	90	10	300.9	3	0	0	70	1008	10
6	11	30	334	18	-3.5	0.073	-9	-9	-999	46	10	0.37	0.38	0.67	1.2	100	10	299.6	3	0	0	77	1009	7
6	11	30	334	19	-4.3	0.079	-9	-9	-999	51	10.3	0.37	0.38	1	1.3	96	10	298.1	3	0	1.27	88	1010	7
6	11	30	334	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	75	10	297.6	3	0	0	91	1010	7
6	11	30	334	21	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	297.4	3	0	0	94	1010	7
6	11	30	334	22	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	82	10	297.4	3	0	0	100	1010	7
6	11	30	334	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	72	10	297	3	0	0	97	1009	0
6	11	30	334	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	297	3	0	0	94	1009	3
6	12	1	335	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	296.6	3	0	0	94	1008	3
6	12	1	335	2	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	113	10	296.8	3	0	0	100	1008	0
6	12	1	335	3	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	104	10	297.1	3	0	0	100	1008	3
6	12	1	335	4	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	112	10	297.1	3	0	0	94	1008	3
6	12	1	335	5	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	113	10	297.1	3	0	0	100	1009	0
6	12	1	335	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	297.2	3	0	0.76	100	1009	3
6	12	1	335	7	-1.7	0.049	-9	-9	-999	25	6.1	0.37	0.38	0.58	0.8	116	10	298.6	3	0	0	88	1010	0
6	12	1	335	8	19.5	0.158	0.487	0.008	213	144	-18.2	0.37	0.38	0.29	1	86	10	298.8	3	0	0.25	97	1011	8
6	12	1	335	9	96.8	0.192	0.941	0.006	310	193	-6.6	0.655	0.64	0.2	0.8	68	10	301.4	3	0	0	94	1011	0
6	12	1	335	10	124.7	0.227	1.148	0.005	438	249	-8.5	0.655	0.64	0.19	1	69	10	303.4	3	0	0	75	1010	6
6	12	1	335	11	93.9	0.234	1.116	0.005	534	261	-12.4	0.37	0.38	0.19	1.4	90	10	303.9	3	0	0	72	1009	7
6	12	1	335	12	110.7	0.305	1.504	0.006	1107	388	-23.1	0.37	0.38	0.19	2	120	10	304.8	3	0	0	70	1008	7
6	12	1	335	13	104.5	0.293	1.502	0.006	1167	364	-21.6	0.37	0.38	0.19	1.9	117	10	304.9	3	0	0	66	1007	7
6	12	1	335	14	76.8	0.284	1.373	0.006	1211	348	-26.8	0.37	0.38	0.19	1.9	113	10	304.9	3	0	0	63	1007	8
6	12	1	335	15	22.5	0.247	0.916	0.006	1224	283	-60	0.37	0.38	0.19	1.8	105	10	304.1	3	0	0	63	1007	10
6	12	1	335	16	20	0.213	0.883	0.006	1233	226	-43.2	0.37	0.38	0.22	1.5	100	10	302.6	3	0	0	65	1007	10
6	12	1	335	17	0.1	0.134	0.151	0.006	1231	115	-2168.9	0.37	0.38	0.31	1.1	102	10	300.6	3	0	0	70	1007	3
6	12	1	335	18	-1.8	0.049	-9	-9	-999	29	5.8	0.37	0.38	0.66	0.8	98	10	299.5	3	0	0	77	1007	3
6	12	1	335	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	298.5	3	0	0	82	1008	3
6	12	1	335	20	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	88	10	298.2	3	0	0	88	1009	3
6	12	1	335	21	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	95	10	297.8	3	0	0	100	1009	3
6	12	1	335	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	296.9	3	0	0	94	1009	3
6	12	1	335	23	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	75	10	296.9	3	0	0	100	1009	3
6	12	1	335	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	296.4	3	0	0	100	1008	3
6	12	2	336	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	92	10	296.4	3	0	0	97	1007	3
6	12	2	336	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	296.1	3	0	0	100	1007	3
6	12	2	336	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	93	10	295.9	3	0	0	100	1007	3
6	12	2	336	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	295.5	3	0	0	100	1007	3
6	12	2	336	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	295.6	3	0	0	100	1008	3
6	12	2	336	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	296.8	3	0	0	93	1008	3
6	12	2	336	7	-2.2	0.059	-9	-9	-999	33	8.1	0.655	0.64	0.57	0.8	73	10	300.4	3	0	0	100	1009	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	2	336	8	73.3	0.241	0.988	0.006	474	272	-17.1	0.655	0.64	0.28	1.2	78	10	302.4	3	0	0	88	1010	0
6	12	2	336	9	82.6	0.231	1.103	0.005	586	255	-13.4	0.37	0.38	0.21	1.4	97	10	303.8	3	0	0	75	1010	0
6	12	2	336	10	92.2	0.199	1.205	0.005	684	205	-7.7	0.37	0.38	0.19	1.1	98	10	304.6	3	0	0	70	1010	6
6	12	2	336	11	108.1	0.238	1.327	0.005	780	267	-11.2	0.37	0.38	0.19	1.4	104	10	305.1	3	0	0	61	1009	6
6	12	2	336	12	62.7	0.268	1.123	0.005	813	319	-27.6	0.37	0.38	0.19	1.8	117	10	303.8	3	0	0	58	1008	9
6	12	2	336	13	29	-9	-9	-9	826	-999	-99999	0.542	0.56	0.17	0	0	10	301.4	3	0	0.76	66	1008	10
6	12	2	336	14	29.9	0.128	0.892	0.005	851	105	-6.3	0.736	0.77	0.18	0.5	162	10	300.2	3	0	1.27	70	1007	10
6	12	2	336	15	23.4	0.175	0.83	0.005	879	168	-20.6	0.655	0.64	0.19	0.9	78	10	300.8	3	0	0.25	75	1007	10
6	12	2	336	16	7.1	0.165	0.559	0.005	886	155	-57.5	0.37	0.38	0.22	1.2	103	10	300.4	3	0	0	74	1007	10
6	12	2	336	17	0.1	0.133	0.135	0.005	884	112	-2109.6	0.655	0.64	0.3	0.9	71	10	299.5	3	0	0	82	1007	10
6	12	2	336	18	-1.6	0.051	-9	-9	-999	30	7.7	0.655	0.64	0.66	0.7	55	10	298.5	3	0	0	88	1008	7
6	12	2	336	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	78	10	298.1	3	0	0	88	1008	7
6	12	2	336	20	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	297.9	3	0	0	91	1009	3
6	12	2	336	21	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	70	10	297.5	3	0	0	88	1009	3
6	12	2	336	22	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	98	10	297.1	3	0	0	88	1009	3
6	12	2	336	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	95	10	297	3	0	0	97	1008	3
6	12	2	336	24	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	60	10	296.8	3	0	0	94	1008	3
6	12	3	337	1	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	52	10	296.4	3	0	0	100	1007	3
6	12	3	337	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	62	10	296.4	3	0	0	97	1007	0
6	12	3	337	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	68	10	296.4	3	0	0	100	1007	3
6	12	3	337	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	296.4	3	0	0	100	1007	3
6	12	3	337	5	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	109	10	296.5	3	0	0	97	1008	3
6	12	3	337	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	87	10	297.8	3	0	0	100	1008	3
6	12	3	337	7	-2.6	0.061	-9	-9	-999	34	7.6	0.37	0.38	0.59	1	91	10	300.6	3	0	0	94	1009	0
6	12	3	337	8	73.4	0.185	0.773	0.005	227	183	-7.8	0.655	0.64	0.28	0.8	57	10	302.9	3	0	0	85	1010	0
6	12	3	337	9	112.1	0.21	1.296	0.005	700	221	-7.4	0.655	0.64	0.21	0.9	71	10	303.9	3	0	0	75	1010	0
6	12	3	337	10	94.7	0.191	1.319	0.005	873	193	-6.7	0.655	0.64	0.19	0.8	34	10	303.9	3	0	0	70	1010	8
6	12	3	337	11	14.2	0.179	0.705	0.005	885	175	-36.5	0.655	0.64	0.18	1	45	10	300	3	0	14.99	70	1009	10
6	12	3	337	12	14.5	0.159	0.712	0.005	899	146	-25.1	0.736	0.77	0.18	0.8	149	10	297.4	3	0	29.72	82	1009	10
6	12	3	337	13	49.7	0.183	1.099	0.005	958	180	-11.1	0.736	0.77	0.18	0.8	172	10	299.5	3	0	0	85	1007	10
6	12	3	337	14	46.6	0.173	1.096	0.005	1014	166	-10.1	0.37	0.38	0.19	1	100	10	301.4	3	0	0	94	1007	9
6	12	3	337	15	32.1	0.221	0.979	0.005	1049	239	-30.2	0.655	0.64	0.19	1.2	37	10	300.4	3	0	0	94	1007	10
6	12	3	337	16	17.4	0.183	0.804	0.005	1070	180	-31.6	0.655	0.64	0.21	1	69	10	300.9	3	0	0	82	1007	10
6	12	3	337	17	0.1	0.133	0.144	0.005	1069	112	-2108.9	0.655	0.64	0.3	0.9	75	10	299.9	3	0	0	85	1007	10
6	12	3	337	18	-1.5	0.049	-9	-9	-999	28	6.7	0.37	0.38	0.66	0.8	92	10	299.1	3	0	0	94	1007	7
6	12	3	337	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	90	10	298.5	3	0	0	94	1008	7
6	12	3	337	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	91	10	298.4	3	0	0	97	1008	7
6	12	3	337	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	298.1	3	0	0	94	1009	7
6	12	3	337	22	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	298	3	0	0	94	1009	7
6	12	3	337	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	81	10	297.9	3	0	0	97	1008	7
6	12	3	337	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	82	10	297.5	3	0	0	100	1008	7
6	12	4	338	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	94	10	297.4	3	0	0	100	1007	7
6	12	4	338	2	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	89	10	297.2	3	0	0	100	1007	0
6	12	4	338	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	86	10	297.2	3	0	0	100	1007	7
6	12	4	338	4	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	82	10	297	3	0	0	100	1007	7
6	12	4	338	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	296.9	3	0	0	100	1008	7
6	12	4	338	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297	3	0	0	100	1008	7
6	12	4	338	7	-2.7	0.061	-9	-9	-999	34	7.5	0.37	0.38	0.59	1	95	10	299	3	0	0	100	1009	0
6	12	4	338	8	51.3	0.242	0.578	0.007	135	273	-24.8	0.37	0.38	0.29	1.6	102	10	301.4	3	0	0	97	1010	0

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	4	338	9	81	0.264	0.827	0.007	252	312	-20.4	0.37	0.38	0.21	1.7	116	10	303.1	3	0	0	88	1010	0
6	12	4	338	10	107.4	0.283	1.065	0.006	406	345	-18.9	0.37	0.38	0.19	1.8	126	10	303.5	3	0	0	80	1010	0
6	12	4	338	11	110.1	0.272	1.199	0.005	564	326	-16.4	0.37	0.38	0.19	1.7	133	10	303.9	3	0	0	79	1009	6
6	12	4	338	12	111.8	0.295	1.334	0.005	765	368	-20.6	0.37	0.38	0.19	1.9	129	10	304.4	3	0	0	75	1008	6
6	12	4	338	13	93.3	0.234	1.307	0.005	861	262	-12.4	0.37	0.38	0.19	1.4	138	10	304.9	3	0	0	59	1007	8
6	12	4	338	14	115.1	0.29	1.478	0.005	1007	360	-19.1	0.736	0.77	0.18	1.4	154	10	305.2	3	0	0	66	1007	8
6	12	4	338	15	23.7	0.237	0.88	0.005	1034	267	-50.6	0.37	0.38	0.19	1.7	119	10	303.9	3	0	0	61	1007	10
6	12	4	338	16	18.3	0.233	0.812	0.005	1049	258	-61.8	0.37	0.38	0.22	1.7	118	10	301.4	3	0	0	70	1007	10
6	12	4	338	17	0.1	0.146	0.143	0.005	1044	131	-2807.7	0.37	0.38	0.31	1.2	109	10	300	3	0	0	77	1008	10
6	12	4	338	18	-2	0.059	-9	-9	-999	37	8.9	0.655	0.64	0.65	0.8	77	10	299.4	3	0	0	82	1008	7
6	12	4	338	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	58	10	298.8	3	0	0	88	1009	7
6	12	4	338	20	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	66	10	298.4	3	0	0	91	1009	3
6	12	4	338	21	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	71	10	298.2	3	0	0	88	1010	3
6	12	4	338	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297.9	3	0	0	94	1010	7
6	12	4	338	23	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	297.9	3	0	0	94	1009	7
6	12	4	338	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	65	10	297.9	3	0	0	88	1009	7
6	12	5	339	1	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	102	10	298	3	0	0	94	1009	3
6	12	5	339	2	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	97	10	298	3	0	0	97	1008	7
6	12	5	339	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	88	10	297.9	3	0	0	100	1008	7
6	12	5	339	4	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	75	10	298.1	3	0	0	100	1008	7
6	12	5	339	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	75	10	298.5	3	0	0	100	1008	7
6	12	5	339	6	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	92	10	299	3	0	0	100	1009	7
6	12	5	339	7	-2.2	0.055	-9	-9	-999	29	6.8	0.37	0.38	0.6	0.9	100	10	301.9	3	0	0	100	1010	0
6	12	5	339	8	45.1	0.293	0.839	0.045	472	365	-50.4	0.37	0.38	0.29	2.1	124	10	302.8	3	0	0	88	1011	0
6	12	5	339	9	72.9	0.304	0.989	0.044	479	386	-34.9	0.37	0.38	0.21	2.1	125	10	304	3	0	0	80	1011	0
6	12	5	339	10	74.6	0.283	1.003	0.043	487	347	-27.4	0.37	0.38	0.19	1.9	114	10	304	3	0	0	75	1011	8
6	12	5	339	11	74	0.283	1.005	0.042	494	346	-27.6	0.37	0.38	0.19	1.9	114	10	304.1	3	0	0	70	1010	8
6	12	5	339	12	48.2	0.273	0.874	0.041	499	328	-38.1	0.37	0.38	0.19	1.9	117	10	301.8	3	0	5.08	85	1009	10
6	12	5	339	13	83.1	0.254	1.054	0.04	507	294	-17.7	0.37	0.38	0.19	1.6	106	10	301.5	3	0	1.78	80	1009	8
6	12	5	339	14	32.2	0.177	0.77	0.04	510	173	-15.6	0.37	0.38	0.19	1.1	107	10	299.4	3	0	3.3	77	1008	10
6	12	5	339	15	26.6	0.185	0.725	0.039	514	183	-21.4	0.37	0.38	0.19	1.2	106	10	301.9	3	0	0	80	1008	10
6	12	5	339	16	16	0.209	0.612	0.039	515	220	-51.3	0.37	0.38	0.22	1.5	109	10	301.6	3	0	0	75	1008	10
6	12	5	339	17	0.1	0.182	0.113	0.039	515	179	-5457.1	0.37	0.38	0.31	1.5	102	10	299.9	3	0	0.51	88	1009	10
6	12	5	339	18	-2.8	0.061	-9	-9	-999	47	7.1	0.37	0.38	0.65	1	102	10	298.1	3	0	0	100	1009	0
6	12	5	339	19	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	62	10	298.1	3	0	0	100	1010	0
6	12	5	339	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	58	10	297.8	3	0	2.54	97	1011	7
6	12	5	339	21	-1.4	0.051	-9	-9	-999	27	9	0.655	0.64	1	0.7	50	10	297.4	3	0	0	100	1011	10
6	12	5	339	22	-1	0.044	-9	-9	-999	21	7.7	0.655	0.64	1	0.6	60	10	297.4	3	0	0.25	100	1011	10
6	12	5	339	23	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	66	10	297.4	3	0	0	100	1011	7
6	12	5	339	24	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	53	10	297.1	3	0	5.33	100	1011	7
6	12	6	340	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	59	10	297	3	0	0.51	100	1010	7
6	12	6	340	2	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	66	10	297	3	0	0	100	1009	7
6	12	6	340	3	-4.9	0.088	-9	-9	-999	60	12.6	0.655	0.64	1	1.2	73	10	296.9	3	0	1.78	100	1009	7
6	12	6	340	4	-8.7	0.117	-9	-9	-999	93	16.8	0.655	0.64	1	1.6	68	10	296.8	3	0	1.27	100	1010	7
6	12	6	340	5	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	89	10	296.4	3	0	2.54	100	1010	7
6	12	6	340	6	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	80	10	296.1	3	0	7.87	100	1011	7
6	12	6	340	7	-2.7	0.061	-9	-9	-999	34	7.3	0.37	0.38	0.6	1	97	10	296.5	3	0	1.02	100	1012	0
6	12	6	340	8	10.5	0.138	-9	-9	-999	118	-22.5	0.37	0.38	0.29	0.9	99	10	297.2	3	0	1.27	100	1013	10
6	12	6	340	9	36.7	0.213	-9	-9	-999	225	-23.6	0.37	0.38	0.21	1.4	96	10	298.8	3	0	0	100	1013	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	6	340	10	22.9	0.258	-9	-9	-999	302	-67.9	0.37	0.38	0.19	1.9	101	10	298.4	3	0	0.25	100	1013	10
6	12	6	340	11	38.1	0.329	-9	-9	-999	433	-84.1	0.655	0.64	0.18	2	82	10	297.2	3	0	0.76	100	1013	10
6	12	6	340	12	11.5	0.182	-9	-9	-999	191	-47.7	0.37	0.38	0.19	1.3	114	10	297.4	3	0	0.25	94	1012	10
6	12	6	340	13	31.8	0.177	-9	-9	-999	171	-15.7	0.37	0.38	0.19	1.1	102	10	298.1	3	0	0.51	94	1010	10
6	12	6	340	14	37.2	0.202	-9	-9	-999	209	-20.1	0.37	0.38	0.19	1.3	97	10	299.4	3	0	0	94	1009	10
6	12	6	340	15	28.3	0.208	-9	-9	-999	218	-28.5	0.37	0.38	0.19	1.4	92	10	299.9	3	0	0	94	1009	10
6	12	6	340	16	9.2	0.18	-9	-9	-999	175	-56.4	0.37	0.38	0.22	1.3	113	10	299.6	3	0	0	88	1009	10
6	12	6	340	17	0.1	0.098	-9	-9	-999	73	-855.8	0.37	0.38	0.31	0.8	89	10	299	3	0	0	94	1009	10
6	12	6	340	18	-1.2	0.042	-9	-9	-999	21	5.9	0.37	0.38	0.65	0.7	99	10	298.8	3	0	0	94	1010	7
6	12	6	340	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	298.6	3	0	0	100	1010	7
6	12	6	340	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	84	10	298.5	3	0	0	97	1010	7
6	12	6	340	21	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	75	10	298.4	3	0	0	100	1010	7
6	12	6	340	22	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	38	10	298	3	0	0	88	1010	7
6	12	6	340	23	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.6	3	0	0	94	1010	7
6	12	6	340	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.6	3	0	0	100	1010	7
6	12	7	341	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	86	10	298	3	0	0	94	1009	7
6	12	7	341	2	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	38	10	297.5	3	0	0	94	1009	7
6	12	7	341	3	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297.9	3	0	0	88	1009	7
6	12	7	341	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	42	10	297.8	3	0	0	94	1009	7
6	12	7	341	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	68	10	297.4	3	0	0	94	1009	7
6	12	7	341	6	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	62	10	297.6	3	0	0	94	1010	7
6	12	7	341	7	-1.8	0.051	-9	-9	-999	27	6.9	0.655	0.64	0.6	0.7	76	10	300.1	3	0	0	94	1011	0
6	12	7	341	8	53.5	0.232	0.665	0.005	198	257	-21	0.37	0.38	0.3	1.5	97	10	302.8	3	0	0	85	1012	0
6	12	7	341	9	84.8	0.297	1.102	0.005	571	373	-28	0.37	0.38	0.22	2	98	10	303.8	3	0	0	85	1012	0
6	12	7	341	10	93.1	0.268	1.272	0.005	798	319	-18.6	0.37	0.38	0.19	1.7	98	10	304.4	3	0	0	75	1012	5
6	12	7	341	11	106.8	0.282	1.398	0.005	923	345	-19	0.37	0.38	0.19	1.8	106	10	305.1	3	0	0	66	1011	6
6	12	7	341	12	91.9	0.289	1.38	0.005	1030	357	-23.6	0.37	0.38	0.19	1.9	116	10	304.8	3	0	0	62	1010	8
6	12	7	341	13	90.9	0.299	1.463	0.005	1240	377	-26.5	0.37	0.38	0.19	2	126	10	305.2	3	0	0	66	1009	8
6	12	7	341	14	38.2	0.246	1.171	0.006	1513	282	-35.2	0.37	0.38	0.19	1.7	92	10	302.2	3	0	0.76	91	1009	10
6	12	7	341	15	9.6	0.224	0.741	0.006	1516	244	-104.8	0.37	0.38	0.19	1.7	110	10	299.8	3	0	0.25	88	1009	10
6	12	7	341	16	0.5	0.137	0.274	0.006	1515	118	-471.1	0.37	0.38	0.22	1.1	96	10	298.8	3	0	6.6	100	1009	10
6	12	7	341	17	0.1	0.098	0.162	0.006	1513	71	-856	0.37	0.38	0.31	0.8	122	10	297.9	3	0	0.51	91	1010	7
6	12	7	341	18	-2.6	0.066	-9	-9	-999	39	10.1	0.655	0.64	0.64	0.9	54	10	297.5	3	0	0	100	1010	7
6	12	7	341	19	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	297.4	3	0	2.03	95	1010	3
6	12	7	341	20	-7.4	0.103	-9	-9	-999	76	13.4	0.37	0.38	1	1.7	97	10	297.1	3	0	13.72	91	1012	7
6	12	7	341	21	-16.1	0.198	-9	-9	-999	203	43.7	0.37	0.38	1	2.2	87	10	296.5	3	0	19.05	100	1012	7
6	12	7	341	22	-3.6	0.067	-9	-9	-999	55	7.5	0.37	0.38	1	1.1	125	10	296.4	3	0	5.84	100	1011	0
6	12	7	341	23	-3.2	0.066	-9	-9	-999	39	8.2	0.655	0.64	1	0.9	52	10	296.5	3	0	0.25	100	1010	0
6	12	7	341	24	-2.7	0.066	-9	-9	-999	39	9.4	0.655	0.64	1	0.9	58	10	296.5	3	0	0	94	1010	7
6	12	8	342	1	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	68	10	296.5	3	0	0	94	1009	7
6	12	8	342	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	57	10	296.6	3	0	0	97	1009	7
6	12	8	342	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	77	10	296.8	3	0	0	100	1009	7
6	12	8	342	4	-0.6	0.03	-9	-9	-999	12	3.9	0.37	0.38	1	0.5	95	10	296.8	3	0	0	94	1009	7
6	12	8	342	5	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.8	3	0	0	97	1009	7
6	12	8	342	6	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	56	10	297.2	3	0	0	94	1010	7
6	12	8	342	7	-3.7	0.073	-9	-9	-999	46	9.7	0.655	0.64	0.6	1	74	10	298.4	3	0	0	100	1011	0
6	12	8	342	8	34	0.182	0.649	0.005	290	179	-16.1	0.655	0.64	0.29	0.9	78	10	299.6	3	0	0.25	97	1012	7
6	12	8	342	9	90.6	0.26	1.043	0.005	452	305	-17.5	0.655	0.64	0.21	1.3	81	10	302	3	0	0	85	1012	6
6	12	8	342	10	86.6	0.287	1.294	0.005	903	354	-24.6	0.37	0.38	0.19	1.9	91	10	303.4	3	0	0	75	1012	6

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	8	342	11	111.6	0.316	1.496	0.006	1082	408	-25.5	0.37	0.38	0.19	2.1	96	10	304.5	3	0	0	70	1011	6
6	12	8	342	12	102.7	0.357	1.473	0.006	1123	491	-40	0.37	0.38	0.19	2.5	97	10	303.6	3	0	0	66	1010	7
6	12	8	342	13	75	0.349	1.344	0.006	1166	474	-50.9	0.37	0.38	0.19	2.5	106	10	303.1	3	0	0	70	1009	9
6	12	8	342	14	40.5	0.291	1.102	0.006	1188	362	-54.7	0.37	0.38	0.19	2.1	103	10	301.6	3	0	0	65	1009	10
6	12	8	342	15	29.2	0.241	0.993	0.006	1205	273	-43.1	0.37	0.38	0.19	1.7	106	10	302.2	3	0	0	75	1008	10
6	12	8	342	16	13.7	0.25	0.773	0.006	1213	288	-103.1	0.37	0.38	0.22	1.9	109	10	301.9	3	0	0	75	1008	10
6	12	8	342	17	0.1	0.134	0.15	0.006	1211	119	-2173.2	0.37	0.38	0.31	1.1	102	10	300.5	3	0	0	80	1009	10
6	12	8	342	18	-3.8	0.081	-9	-9	-999	53	12.5	0.655	0.64	0.64	1.1	83	10	299.6	3	0	0	88	1009	7
6	12	8	342	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	85	10	298.9	3	0	0	88	1010	7
6	12	8	342	20	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	82	10	298.4	3	0	0	94	1010	7
6	12	8	342	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	68	10	298	3	0	0	94	1011	7
6	12	8	342	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	59	10	297.8	3	0	0	94	1011	7
6	12	8	342	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	67	10	297.9	3	0	0	94	1010	7
6	12	8	342	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.9	3	0	0	94	1010	7
6	12	9	343	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	54	10	298	3	0	0	100	1010	7
6	12	9	343	2	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	104	10	297.9	3	0	0	100	1009	7
6	12	9	343	3	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	85	10	297.5	3	0	0	100	1009	7
6	12	9	343	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	43	10	297.1	3	0	0.25	100	1010	7
6	12	9	343	5	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	72	10	297.4	3	0	5.84	97	1010	7
6	12	9	343	6	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	97	10	297.6	3	0	2.54	100	1011	7
6	12	9	343	7	-2.8	0.061	-9	-9	-999	34	7.3	0.37	0.38	0.62	1	88	10	298.1	3	0	0	94	1012	0
6	12	9	343	8	26.2	0.229	0.52	0.006	194	253	-41.6	0.655	0.64	0.29	1.3	77	10	299	3	0	0	91	1013	8
6	12	9	343	9	53.4	0.259	0.758	0.005	294	303	-29.3	0.655	0.64	0.21	1.4	74	10	299.9	3	0	0	94	1013	9
6	12	9	343	10	55.1	0.243	0.848	0.005	400	276	-23.5	0.37	0.38	0.19	1.6	90	10	301.8	3	0	0	85	1012	9
6	12	9	343	11	109.2	0.344	1.198	0.005	569	464	-33.7	0.655	0.64	0.18	1.9	85	10	302.9	3	0	0	75	1012	8
6	12	9	343	12	77.3	0.317	1.134	0.005	679	411	-37.1	0.37	0.38	0.19	2.2	90	10	302.9	3	0	0	75	1010	8
6	12	9	343	13	85	0.33	1.261	0.005	850	437	-38.2	0.37	0.38	0.19	2.3	98	10	303.1	3	0	0	65	1010	8
6	12	9	343	14	63.5	0.344	1.185	0.005	943	464	-57.8	0.37	0.38	0.19	2.5	102	10	303	3	0	0	77	1009	9
6	12	9	343	15	29.5	0.274	0.931	0.005	986	331	-62.5	0.37	0.38	0.19	2	90	10	302.9	3	0	0	70	1009	10
6	12	9	343	16	17	0.242	0.78	0.005	1005	275	-75.6	0.37	0.38	0.22	1.8	88	10	300.9	3	0	0	70	1009	10
6	12	9	343	17	0.1	0.206	0.141	0.005	1000	215	-7849.8	0.655	0.64	0.3	1.4	83	10	299	3	0	0	77	1010	10
6	12	9	343	18	-3.8	0.081	-9	-9	-999	64	12.5	0.655	0.64	0.64	1.1	83	10	298.4	3	0	3.3	88	1010	7
6	12	9	343	19	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	66	10	298.2	3	0	0	88	1011	7
6	12	9	343	20	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	65	10	298	3	0	0	94	1011	7
6	12	9	343	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	69	10	297.9	3	0	0	88	1012	7
6	12	9	343	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	297.9	3	0	0	88	1012	7
6	12	9	343	23	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	87	10	297.9	3	0	0	97	1012	7
6	12	9	343	24	-3.5	0.067	-9	-9	-999	40	7.7	0.37	0.38	1	1.1	114	10	297.4	3	0	0	100	1011	3
6	12	10	344	1	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	41	10	296.6	3	0	0.25	100	1010	7
6	12	10	344	2	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.6	3	0	1.27	100	1010	7
6	12	10	344	3	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	166	10	296.9	3	0	0	100	1010	7
6	12	10	344	4	-1.8	0.054	-9	-9	-999	29	7.8	0.736	0.77	1	0.7	166	10	296.9	3	0	0	100	1010	7
6	12	10	344	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	118	10	297.2	3	0	1.02	100	1011	7
6	12	10	344	6	-2	0.054	-9	-9	-999	29	7	0.736	0.77	1	0.7	179	10	297.2	3	0	0.25	100	1011	3
6	12	10	344	7	-4	0.077	-9	-9	-999	49	10.3	0.736	0.77	0.61	1	184	10	298	3	0	0	100	1012	0
6	12	10	344	8	49.3	0.197	0.691	0.007	242	201	-14	0.736	0.77	0.29	0.9	184	10	300.1	3	0	0	97	1013	0
6	12	10	344	9	74.8	-9	-9	-9	319	-999	-99999	0.542	0.56	0.2	0	0	10	302.5	3	0	0	88	1014	7
6	12	10	344	10	48.5	0.19	0.791	0.005	368	190	-12.7	0.655	0.64	0.19	0.9	350	10	301	3	0	0	88	1013	10
6	12	10	344	11	56.4	0.15	0.873	0.005	425	133	-5.4	0.655	0.64	0.18	0.6	342	10	301.4	3	0	0	80	1013	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	10	344	12	19.5	0.263	0.622	0.005	444	310	-84.1	0.655	0.64	0.18	1.6	354	10	299.8	3	0	1.52	82	1012	10
6	12	10	344	13	55	0.222	0.914	0.005	500	240	-17.9	0.37	0.38	0.19	1.4	100	10	299.9	3	0	2.03	94	1011	9
6	12	10	344	14	51.9	0.22	0.928	0.005	556	238	-18.6	0.37	0.38	0.19	1.4	88	10	302	3	0	0	82	1010	9
6	12	10	344	15	18.8	0.201	0.694	0.005	637	207	-38.7	0.37	0.38	0.19	1.4	86	10	301.1	3	0	0	75	1010	10
6	12	10	344	16	6.8	0.182	0.502	0.005	669	178	-79.3	0.655	0.64	0.21	1.1	84	10	300.4	3	0	0	85	1010	10
6	12	10	344	17	0.1	0.075	0.123	0.005	665	53	-377.6	0.37	0.38	0.3	0.6	96	10	299.9	3	0	0	80	1010	10
6	12	10	344	18	-1.9	0.055	-9	-9	-999	29	7.8	0.37	0.38	0.64	0.9	113	10	299.1	3	0	0	88	1011	7
6	12	10	344	19	-1.2	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	94	10	298.5	3	0	0	88	1012	7
6	12	10	344	20	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	77	10	298.2	3	0	0	94	1012	0
6	12	10	344	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	80	10	297.9	3	0	0	94	1012	7
6	12	10	344	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	74	10	297.6	3	0	0	88	1012	7
6	12	10	344	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	77	10	297.6	3	0	0	91	1012	0
6	12	10	344	24	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	70	10	297.8	3	0	0	100	1012	7
6	12	11	345	1	-6.6	0.103	-9	-9	-999	76	14.7	0.655	0.64	1	1.4	80	10	297.9	3	0	0	100	1011	7
6	12	11	345	2	-2.1	0.055	-9	-9	-999	30	7.1	0.37	0.38	1	0.9	89	10	297.8	3	0	0	100	1010	7
6	12	11	345	3	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	79	10	297.9	3	0	0	94	1010	7
6	12	11	345	4	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	73	10	297.5	3	0	0	94	1010	7
6	12	11	345	5	-3.7	0.073	-9	-9	-999	45	9.5	0.37	0.38	1	1.2	96	10	297.6	3	0	0	97	1011	7
6	12	11	345	6	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	97	10	297.9	3	0	0	94	1012	7
6	12	11	345	7	-2.4	0.059	-9	-9	-999	33	7.7	0.655	0.64	0.62	0.8	85	10	298.4	3	0	0	94	1013	0
6	12	11	345	8	52.4	0.271	0.707	0.005	243	325	-34.3	0.655	0.64	0.29	1.5	85	10	301.4	3	0	0	85	1014	0
6	12	11	345	9	81.6	0.34	1.046	0.005	506	456	-43.5	0.37	0.38	0.22	2.4	95	10	302.4	3	0	0	75	1013	0
6	12	11	345	10	90.2	0.321	1.259	0.005	799	418	-33	0.37	0.38	0.19	2.2	100	10	303.4	3	0	0	65	1013	6
6	12	11	345	11	99.9	0.346	1.355	0.005	900	467	-37.3	0.37	0.38	0.19	2.4	106	10	303.5	3	0	0	70	1013	7
6	12	11	345	12	67.3	0.313	1.214	0.005	961	404	-41.3	0.37	0.38	0.19	2.2	122	10	302.8	3	0	0	66	1013	9
6	12	11	345	13	56	0.287	1.162	0.005	1011	355	-38.2	0.37	0.38	0.19	2	109	10	302.6	3	0	0	70	1012	9
6	12	11	345	14	45.7	0.304	1.102	0.005	1053	386	-55.5	0.37	0.38	0.19	2.2	110	10	302.4	3	0	0	80	1010	9
6	12	11	345	15	29.2	0.273	0.956	0.005	1079	329	-63	0.37	0.38	0.19	2	105	10	302.1	3	0	0	75	1009	10
6	12	11	345	16	7.3	0.199	0.604	0.005	1084	205	-96.4	0.37	0.38	0.22	1.5	109	10	300.9	3	0	0	70	1009	10
6	12	11	345	17	0.1	0.146	0.145	0.005	1082	129	-2812.4	0.37	0.38	0.3	1.2	107	10	299.9	3	0	0	72	1009	10
6	12	11	345	18	-1.9	0.055	-9	-9	-999	34	7.8	0.37	0.38	0.63	0.9	107	10	298.8	3	0	0	82	1010	7
6	12	11	345	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	116	10	298.2	3	0	0	82	1011	7
6	12	11	345	20	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	104	10	297.9	3	0	0	88	1011	0
6	12	11	345	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	73	10	297.4	3	0	0	88	1012	3
6	12	11	345	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	297	3	0	0	88	1012	3
6	12	11	345	23	-1.1	0.036	-9	-9	-999	16	4.1	0.37	0.38	1	0.6	102	10	297.1	3	0	0	97	1012	0
6	12	11	345	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	296.9	3	0	0	94	1012	3
6	12	12	346	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	75	10	296.9	3	0	0	100	1011	3
6	12	12	346	2	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	67	10	296.8	3	0	0	97	1010	0
6	12	12	346	3	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	41	10	296	3	0	0	94	1010	7
6	12	12	346	4	-1	0.037	-9	-9	-999	16	4.6	0.655	0.64	1	0.5	82	10	296	3	0	0	100	1010	0
6	12	12	346	5	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	112	10	296.4	3	0	0	93	1010	7
6	12	12	346	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	48	10	296.8	3	0	0	100	1011	7
6	12	12	346	7	-2.3	0.055	-9	-9	-999	29	6.4	0.37	0.38	0.63	0.9	97	10	297.4	3	0	0	97	1012	0
6	12	12	346	8	17.8	0.167	0.42	0.005	150	157	-23.7	0.37	0.38	0.3	1.1	111	10	298.4	3	0	0	88	1013	8
6	12	12	346	9	60.9	0.178	0.875	0.005	397	173	-8.4	0.37	0.38	0.22	1	98	10	300.4	3	0	0	74	1013	6
6	12	12	346	10	75.2	0.254	1.205	0.005	840	295	-19.8	0.655	0.64	0.19	1.3	79	10	300.9	3	0	0	82	1013	9
6	12	12	346	11	51.1	0.231	1.077	0.005	883	255	-21.7	0.37	0.38	0.19	1.5	122	10	300	3	0	0	77	1013	9
6	12	12	346	12	56.7	0.244	1.147	0.005	961	277	-23.1	0.37	0.38	0.19	1.6	90	10	301.4	3	0	0	88	1012	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	12	346	13	55.7	0.256	1.172	0.005	1042	298	-27.1	0.736	0.77	0.18	1.3	141	10	299.5	3	0	0	82	1010	10
6	12	12	346	14	40.3	0.182	1.073	0.005	1104	179	-13.4	0.37	0.38	0.19	1.1	99	10	301.1	3	0	0	77	1009	10
6	12	12	346	15	30.1	0.231	0.987	0.005	1151	255	-36.8	0.37	0.38	0.19	1.6	129	10	301.2	3	0	0	74	1009	10
6	12	12	346	16	6.6	0.11	0.597	0.005	1166	92	-18.4	0.37	0.38	0.22	0.7	86	10	298.9	3	0	0	77	1009	10
6	12	12	346	17	0.1	0.11	0.148	0.005	1166	84	-1205.3	0.37	0.38	0.3	0.9	90	10	298.8	3	0	0	74	1009	10
6	12	12	346	18	-2.2	0.055	-9	-9	-999	30	6.7	0.37	0.38	0.63	0.9	96	10	298.2	3	0	0	94	1010	3
6	12	12	346	19	-4.6	0.081	-9	-9	-999	53	10.3	0.655	0.64	1	1.1	85	10	297.2	3	0	0	88	1010	3
6	12	12	346	20	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	64	10	296.6	3	0	0	85	1011	7
6	12	12	346	21	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	1	0.8	89	10	296.9	3	0	0	94	1011	0
6	12	12	346	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	106	10	296.9	3	0	0	94	1011	3
6	12	12	346	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	296.8	3	0	0	100	1011	7
6	12	12	346	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	87	10	296.8	3	0	0	100	1010	3
6	12	13	347	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	75	10	296.8	3	0	0	97	1010	3
6	12	13	347	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	76	10	296.6	3	0	0	97	1010	3
6	12	13	347	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	66	10	296.2	3	0	0	97	1009	3
6	12	13	347	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	296.1	3	0	0	94	1010	3
6	12	13	347	5	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	71	10	296.4	3	0	0	94	1010	3
6	12	13	347	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	76	10	296.8	3	0	0	97	1011	7
6	12	13	347	7	-5.4	0.088	-9	-9	-999	60	11.5	0.655	0.64	0.63	1.2	77	10	299.6	3	0	0	100	1012	0
6	12	13	347	8	61.3	0.262	0.704	0.005	206	309	-26.6	0.655	0.64	0.3	1.4	79	10	301.1	3	0	0	90	1013	0
6	12	13	347	9	88.3	0.312	1.136	0.005	601	400	-31	0.655	0.64	0.21	1.7	85	10	301.9	3	0	0	88	1013	5
6	12	13	347	10	79.7	0.263	1.174	0.005	733	312	-20.7	0.37	0.38	0.19	1.7	108	10	301.9	3	0	0	74	1013	7
6	12	13	347	11	82.3	0.286	1.256	0.005	870	351	-25.6	0.37	0.38	0.19	1.9	92	10	303.2	3	0	0	68	1012	8
6	12	13	347	12	76.1	0.305	1.278	0.005	990	388	-33.8	0.37	0.38	0.19	2.1	116	10	302.9	3	0	0	61	1011	8
6	12	13	347	13	50.4	0.231	1.142	0.005	1066	256	-21.9	0.37	0.38	0.19	1.5	102	10	301.2	3	0	0	77	1010	9
6	12	13	347	14	25.2	0.217	0.919	0.005	1106	232	-36.3	0.37	0.38	0.19	1.5	124	10	301	3	0	0	67	1009	10
6	12	13	347	15	22.2	0.247	0.888	0.005	1139	282	-61	0.37	0.38	0.19	1.8	137	10	299.9	3	0	0	79	1009	10
6	12	13	347	16	6.7	0.198	0.597	0.005	1147	203	-104.1	0.37	0.38	0.22	1.5	100	10	299.1	3	0	0	74	1009	10
6	12	13	347	17	0.1	0.162	0.147	0.005	1146	150	-3825.6	0.655	0.64	0.29	1.1	75	10	298.8	3	0	0	85	1009	7
6	12	13	347	18	-5.2	0.095	-9	-9	-999	69	15.1	0.655	0.64	0.62	1.3	77	10	298.1	3	0	0	82	1009	7
6	12	13	347	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	88	10	297.4	3	0	0	79	1010	3
6	12	13	347	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	104	10	297	3	0	0	85	1010	7
6	12	13	347	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	62	10	296.8	3	0	0	94	1011	3
6	12	13	347	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	296.9	3	0	0	94	1010	3
6	12	13	347	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	55	10	296.5	3	0	0	97	1010	7
6	12	13	347	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	85	10	296.2	3	0	0	94	1010	7
6	12	14	348	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	296.1	3	0	0	94	1009	3
6	12	14	348	2	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	73	10	295.9	3	0	0	100	1009	3
6	12	14	348	3	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	83	10	295.9	3	0	0	94	1009	3
6	12	14	348	4	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	86	10	296	3	0	0	90	1009	3
6	12	14	348	5	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	97	10	295.9	3	0	0	93	1010	7
6	12	14	348	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	95	10	296	3	0	0	100	1010	7
6	12	14	348	7	-7.3	0.097	-9	-9	-999	70	11.4	0.37	0.38	0.64	1.6	113	10	297	3	0	0	97	1012	0
6	12	14	348	8	26.9	0.217	0.448	0.005	120	232	-34.2	0.655	0.64	0.3	1.2	82	10	298	3	0	0	97	1012	8
6	12	14	348	9	36.7	0.213	0.572	0.005	184	226	-23.6	0.37	0.38	0.22	1.4	116	10	299.2	3	0	0	94	1012	9
6	12	14	348	10	62.1	0.235	0.776	0.005	271	263	-18.9	0.37	0.38	0.19	1.5	113	10	301	3	0	0	88	1012	8
6	12	14	348	11	65.6	0.248	0.971	0.005	503	283	-20.9	0.37	0.38	0.19	1.6	112	10	302	3	0	0	77	1011	9
6	12	14	348	12	91.1	0.288	1.273	0.005	816	356	-23.7	0.37	0.38	0.19	1.9	106	10	302.9	3	0	0	65	1010	8
6	12	14	348	13	83.8	0.286	1.292	0.005	928	352	-25.2	0.37	0.38	0.19	1.9	108	10	303.2	3	0	0	67	1009	8

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	14	348	14	73.9	0.24	1.283	0.005	1029	271	-16.8	0.37	0.38	0.19	1.5	110	10	304	3	0	0	61	1009	8
6	12	14	348	15	20.5	0.213	0.844	0.005	1053	226	-42.4	0.37	0.38	0.19	1.5	103	10	302.2	3	0	0	63	1009	10
6	12	14	348	16	9.8	0.191	0.663	0.005	1064	192	-63.8	0.37	0.38	0.22	1.4	105	10	301.2	3	0	0	63	1009	10
6	12	14	348	17	0.1	0.11	0.144	0.005	1061	86	-1204.5	0.37	0.38	0.3	0.9	108	10	299.6	3	0	0	72	1009	10
6	12	14	348	18	-1.8	0.055	-9	-9	-999	30	7.9	0.37	0.38	0.62	0.9	89	10	298.6	3	0	0	79	1009	7
6	12	14	348	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	91	10	297.9	3	0	0	79	1009	7
6	12	14	348	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	58	10	297.4	3	0	0	82	1010	7
6	12	14	348	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	60	10	297.4	3	0	0	90	1010	7
6	12	14	348	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	78	10	297.4	3	0	0	94	1011	7
6	12	14	348	23	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	91	10	297.2	3	0	0	100	1010	3
6	12	14	348	24	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	105	10	296.6	3	0	0	100	1010	3
6	12	15	349	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	82	10	296.1	3	0	0	97	1009	3
6	12	15	349	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	77	10	295.9	3	0	0	100	1009	3
6	12	15	349	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	96	10	295.5	3	0	0	100	1009	3
6	12	15	349	4	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	108	10	296	3	0	0	100	1009	3
6	12	15	349	5	-2.4	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	83	10	295.9	3	0	0	100	1009	3
6	12	15	349	6	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	59	10	296	3	0	0	999	1010	3
6	12	15	349	7	-3	0.066	-9	-9	-999	39	8.5	0.655	0.64	0.64	0.9	84	10	298.9	3	0	0	999	1012	0
6	12	15	349	8	46.6	0.185	0.588	0.005	157	182	-12.2	0.37	0.38	0.31	1.1	91	10	301.4	3	0	0	999	1012	0
6	12	15	349	9	61	0.202	0.764	0.005	264	208	-12.1	0.37	0.38	0.22	1.2	104	10	302.8	3	0	0	75	1012	0
6	12	15	349	10	113.6	0.262	1.28	0.005	667	308	-14.2	0.37	0.38	0.19	1.6	122	10	304.2	3	0	0	67	1012	0
6	12	15	349	11	138.8	0.29	1.472	0.005	830	358	-15.8	0.37	0.38	0.19	1.8	131	10	304.9	3	0	0	67	1012	0
6	12	15	349	12	100.5	0.281	1.354	0.005	891	342	-19.8	0.37	0.38	0.19	1.8	128	10	304.4	3	0	0	63	1010	7
6	12	15	349	13	50.3	0.197	1.088	0.005	922	204	-13.7	0.37	0.38	0.19	1.2	122	10	303.9	3	0	0	59	1009	10
6	12	15	349	14	20.8	0.118	0.815	0.005	933	95	-7.1	0.655	0.64	0.18	0.5	26	10	302.4	3	0	0	58	1009	10
6	12	15	349	15	13	0.165	0.698	0.005	940	154	-31.1	0.655	0.64	0.19	0.9	359	10	301.4	3	0	0	63	1008	10
6	12	15	349	16	1.8	0.116	0.359	0.005	941	91	-78.9	0.655	0.64	0.21	0.7	68	10	300.8	3	0	0	63	1008	10
6	12	15	349	17	0.1	0.134	0.138	0.005	940	113	-2172.4	0.37	0.38	0.3	1.1	105	10	299.8	3	0	0	67	1009	7
6	12	15	349	18	-2.1	0.055	-9	-9	-999	32	6.8	0.37	0.38	0.62	0.9	104	10	298.4	3	0	0	74	1009	3
6	12	15	349	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	81	10	297.8	3	0	0	85	1010	3
6	12	15	349	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	64	10	296.9	3	0	0	90	1011	0
6	12	15	349	21	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.8	108	10	296.5	3	0	0	92	1012	99
6	12	15	349	22	-999	-9	-9	-9	-999	-999	-99999	0.37	0.38	1	0.7	102	10	296.2	3	0	0	94	1012	99
6	12	15	349	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	79	10	296.2	3	0	0	97	1012	7
6	12	15	349	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	296.4	3	0	0	97	1011	7
6	12	16	350	1	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	296.5	3	0	0	97	1010	7
6	12	16	350	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	114	10	296.6	3	0	0	97	1009	7
6	12	16	350	3	-2.3	0.061	-9	-9	-999	35	9	0.736	0.77	1	0.8	152	10	296.9	3	0	0	100	1010	7
6	12	16	350	4	-3.6	0.077	-9	-9	-999	49	11.2	0.736	0.77	1	1	151	10	296.8	3	0	0	100	1010	7
6	12	16	350	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	97	10	296.9	3	0	0	100	1010	7
6	12	16	350	6	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.9	3	0	0	100	1011	7
6	12	16	350	7	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	0.65	0.8	63	10	297.9	3	0	0	94	1012	0
6	12	16	350	8	33.3	0.211	0.582	0.005	214	222	-25.4	0.37	0.38	0.31	1.4	114	10	300.4	3	0	0	94	1013	0
6	12	16	350	9	75	0.316	0.926	0.005	383	409	-38.1	0.37	0.38	0.22	2.2	128	10	301.8	3	0	0	88	1013	0
6	12	16	350	10	92.1	0.289	1.042	0.005	443	357	-23.6	0.37	0.38	0.2	1.9	115	10	302.4	3	0	0	82	1013	5
6	12	16	350	11	112.1	0.295	1.359	0.005	809	368	-20.6	0.37	0.38	0.19	1.9	112	10	303	3	0	0	77	1012	5
6	12	16	350	12	82.5	0.275	1.374	0.007	1134	332	-22.8	0.37	0.38	0.19	1.8	112	10	303.4	3	0	0	79	1011	8
6	12	16	350	13	94.1	0.3	1.457	0.006	1187	378	-25.9	0.37	0.38	0.19	2	128	10	303.9	3	0	0	72	1010	8
6	12	16	350	14	67.6	0.281	1.318	0.006	1220	342	-29.5	0.37	0.38	0.19	1.9	120	10	303.8	3	0	0	65	1009	9

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	16	350	15	28.1	0.262	0.987	0.006	1232	309	-57.6	0.37	0.38	0.19	1.9	121	10	302.4	3	0	0	65	1009	10
6	12	16	350	16	19.7	0.202	0.879	0.006	1241	209	-37.4	0.37	0.38	0.22	1.4	112	10	301.8	3	0	0	70	1009	10
6	12	16	350	17	0.1	0.122	0.151	0.006	1240	100	-1640.3	0.37	0.38	0.3	1	111	10	300.1	3	0	0	72	1009	10
6	12	16	350	18	-1.4	0.049	-9	-9	-999	27	7.2	0.37	0.38	0.62	0.8	103	10	299	3	0	0	77	1009	7
6	12	16	350	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	96	10	298.4	3	0	0	82	1010	7
6	12	16	350	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	88	10	298.1	3	0	0	91	1010	0
6	12	16	350	21	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	87	10	297.6	3	0	0	94	1011	7
6	12	16	350	22	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	98	10	297.2	3	0	0	94	1011	7
6	12	16	350	23	-1.4	0.042	-9	-9	-999	20	4.8	0.37	0.38	1	0.7	93	10	297	3	0	0	97	1011	0
6	12	16	350	24	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	296.9	3	0	0	94	1011	7
6	12	17	351	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	297	3	0	0	100	1010	3
6	12	17	351	2	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	93	10	296.9	3	0	0	100	1010	7
6	12	17	351	3	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	87	10	296.5	3	0	0	94	1010	3
6	12	17	351	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	60	10	296.2	3	0	0	100	1010	3
6	12	17	351	5	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	296.1	3	0	0	100	1010	7
6	12	17	351	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	80	10	296.8	3	0	0	94	1011	7
6	12	17	351	7	-3.4	0.067	-9	-9	-999	40	7.8	0.37	0.38	0.66	1.1	94	10	299.2	3	0	0	88	1012	0
6	12	17	351	8	44.2	0.206	0.677	0.005	253	215	-17.8	0.37	0.38	0.31	1.3	90	10	301.4	3	0	0	85	1013	0
6	12	17	351	9	76.7	0.218	1.049	0.005	543	234	-12.2	0.37	0.38	0.22	1.3	100	10	303.1	3	0	0	77	1013	0
6	12	17	351	10	111.2	0.25	1.367	0.005	831	287	-12.6	0.37	0.38	0.2	1.5	124	10	304.5	3	0	0	75	1013	0
6	12	17	351	11	86.5	0.243	1.293	0.005	902	276	-15	0.37	0.38	0.19	1.5	121	10	304.4	3	0	0	70	1012	8
6	12	17	351	12	76.4	0.229	1.268	0.005	963	252	-14.2	0.37	0.38	0.19	1.4	90	10	303.6	3	0	0	79	1011	8
6	12	17	351	13	48.8	0.273	1.107	0.005	1003	329	-37.7	0.37	0.38	0.19	1.9	99	10	303.2	3	0	0	70	1010	10
6	12	17	351	14	45.6	0.304	1.096	0.005	1039	386	-55.6	0.37	0.38	0.19	2.2	116	10	302	3	0	0	72	1009	9
6	12	17	351	15	26.5	0.228	0.921	0.005	1060	253	-40.4	0.37	0.38	0.19	1.6	130	10	301.8	3	0	0	65	1009	10
6	12	17	351	16	15.9	0.187	0.78	0.005	1072	187	-37.2	0.37	0.38	0.22	1.3	114	10	301.2	3	0	0	65	1009	10
6	12	17	351	17	0.1	0.158	0.144	0.005	1070	145	-3564.5	0.37	0.38	0.3	1.3	108	10	299.8	3	0	0	79	1009	10
6	12	17	351	18	-1.7	0.049	-9	-9	-999	35	6.1	0.37	0.38	0.61	0.8	101	10	298.8	3	0	0	77	1009	3
6	12	17	351	19	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	86	10	298.2	3	0	0	88	1010	3
6	12	17	351	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	75	10	297.5	3	0	0	88	1010	3
6	12	17	351	21	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	83	10	297.4	3	0	0	100	1010	3
6	12	17	351	22	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	75	10	297.1	3	0	0	88	1010	3
6	12	17	351	23	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	89	10	296.9	3	0	0	94	1010	0
6	12	17	351	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	296.5	3	0	0	94	1010	3
6	12	18	352	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	49	10	296	3	0	0	100	1009	3
6	12	18	352	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	69	10	295.9	3	0	0	100	1009	7
6	12	18	352	3	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	77	10	295.9	3	0	0	97	1009	3
6	12	18	352	4	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	113	10	296	3	0	0	100	1009	3
6	12	18	352	5	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	88	10	296.1	3	0	0	100	1009	7
6	12	18	352	6	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	90	10	296.5	3	0	0	100	1010	3
6	12	18	352	7	-3.8	0.073	-9	-9	-999	46	9.4	0.655	0.64	0.66	1	80	10	299.1	3	0	0	100	1011	0
6	12	18	352	8	65.1	0.237	0.91	0.005	418	266	-18.5	0.655	0.64	0.3	1.2	84	10	301.4	3	0	0	91	1012	0
6	12	18	352	9	56.6	0.244	1.102	0.005	855	277	-23.2	0.37	0.38	0.22	1.6	101	10	302.1	3	0	0	75	1012	6
6	12	18	352	10	107.5	0.318	1.422	0.005	967	412	-27	0.655	0.64	0.19	1.7	84	10	301.9	3	0	0	82	1012	7
6	12	18	352	11	51.5	0.253	1.133	0.005	1020	293	-28.2	0.37	0.38	0.19	1.7	100	10	301	3	0	1.02	88	1012	9
6	12	18	352	12	38.7	0.192	1.044	0.005	1060	194	-16.4	0.37	0.38	0.19	1.2	120	10	300	3	0	0.25	88	1011	10
6	12	18	352	13	79.7	0.241	1.363	0.005	1146	272	-15.8	0.37	0.38	0.19	1.5	108	10	302.4	3	0	0	75	1009	8
6	12	18	352	14	67.4	0.292	1.316	0.005	1219	362	-33.1	0.37	0.38	0.19	2	111	10	303.2	3	0	0	68	1009	9
6	12	18	352	15	24.3	0.259	0.942	0.005	1242	304	-64.6	0.37	0.38	0.19	1.9	93	10	302.2	3	0	0	75	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	18	352	16	13.6	0.25	0.78	0.005	1255	288	-103.9	0.37	0.38	0.22	1.9	103	10	301.5	3	0	0	74	1009	10
6	12	18	352	17	0.1	0.146	0.152	0.005	1253	133	-2811.4	0.37	0.38	0.3	1.2	101	10	300	3	0	0	72	1009	10
6	12	18	352	18	-2.2	0.061	-9	-9	-999	38	9.1	0.37	0.38	0.61	1	93	10	298.8	3	0	0	82	1009	7
6	12	18	352	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	106	10	297.9	3	0	0	82	1010	7
6	12	18	352	20	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	108	10	297.2	3	0	0	94	1010	7
6	12	18	352	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	62	10	296.8	3	0	0	88	1011	7
6	12	18	352	22	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	61	10	296.4	3	0	0	94	1010	7
6	12	18	352	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	80	10	296.5	3	0	0	100	1010	7
6	12	18	352	24	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	296.6	3	0	0	100	1010	7
6	12	19	353	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	62	10	296.2	3	0	0	100	1009	3
6	12	19	353	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	62	10	296	3	0	0	97	1008	3
6	12	19	353	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	58	10	295.9	3	0	0	97	1008	3
6	12	19	353	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	54	10	295.6	3	0	0	97	1008	3
6	12	19	353	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	48	10	295.4	3	0	0	97	1009	0
6	12	19	353	6	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	61	10	295.4	3	0	0	94	1009	3
6	12	19	353	7	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	0.67	0.7	91	10	299.1	3	0	0	94	1010	0
6	12	19	353	8	33.3	0.2	0.602	0.005	236	206	-21.7	0.37	0.38	0.31	1.3	103	10	301.2	3	0	0	88	1011	0
6	12	19	353	9	68.1	0.249	0.969	0.005	482	285	-20.3	0.37	0.38	0.22	1.6	100	10	302.8	3	0	0	79	1011	0
6	12	19	353	10	75.2	0.283	1.103	0.005	644	347	-27.3	0.37	0.38	0.2	1.9	103	10	303.2	3	0	0	79	1011	7
6	12	19	353	11	91.2	0.288	1.267	0.005	805	356	-23.7	0.37	0.38	0.19	1.9	107	10	303.8	3	0	0	70	1010	7
6	12	19	353	12	99.2	0.291	1.343	0.005	880	361	-22.4	0.37	0.38	0.19	1.9	105	10	304.2	3	0	0	65	1009	7
6	12	19	353	13	82.8	0.297	1.294	0.005	942	372	-28.4	0.37	0.38	0.19	2	102	10	304	3	0	0	65	1008	8
6	12	19	353	14	52.4	0.275	1.127	0.005	981	332	-35.7	0.37	0.38	0.19	1.9	105	10	303.4	3	0	0	65	1008	9
6	12	19	353	15	26.7	0.239	0.906	0.005	1000	270	-46.1	0.37	0.38	0.19	1.7	122	10	302.2	3	0	0	70	1008	10
6	12	19	353	16	13.3	0.206	0.721	0.005	1008	215	-59	0.37	0.38	0.22	1.5	93	10	300.9	3	0	0	70	1008	10
6	12	19	353	17	0.1	0.158	0.141	0.005	1006	145	-3563.3	0.37	0.38	0.3	1.3	102	10	299.6	3	0	0	85	1008	10
6	12	19	353	18	-1.4	0.049	-9	-9	-999	35	7.4	0.37	0.38	0.6	0.8	87	10	298.5	3	0	0.25	94	1009	7
6	12	19	353	19	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	102	10	298.1	3	0	0	100	1009	7
6	12	19	353	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	74	10	297.8	3	0	0	100	1010	7
6	12	19	353	21	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	51	10	297.5	3	0	0	94	1010	7
6	12	19	353	22	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	63	10	297.4	3	0	0	100	1010	7
6	12	19	353	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	82	10	297.2	3	0	0	97	1010	7
6	12	19	353	24	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	96	10	297.4	3	0	0	100	1010	7
6	12	20	354	1	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	91	10	297	3	0	0	100	1009	7
6	12	20	354	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	45	10	296.8	3	0	0	100	1008	7
6	12	20	354	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	53	10	296.4	3	0	0	94	1009	7
6	12	20	354	4	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	296.2	3	0	0	94	1009	7
6	12	20	354	5	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	62	10	295.9	3	0	0	97	1009	7
6	12	20	354	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	67	10	296.1	3	0	0	94	1010	7
6	12	20	354	7	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	0.67	0.8	76	10	298.6	3	0	0	100	1011	0
6	12	20	354	8	31.1	0.177	0.523	0.005	166	171	-16	0.37	0.38	0.31	1.1	102	10	301.5	3	0	0	94	1012	0
6	12	20	354	9	61.2	0.256	1.063	0.007	708	299	-24.9	0.37	0.38	0.22	1.7	112	10	302.4	3	0	0	85	1012	4
6	12	20	354	10	90.2	0.288	1.248	0.007	779	356	-23.9	0.37	0.38	0.2	1.9	107	10	303.8	3	0	0	80	1012	5
6	12	20	354	11	90.1	0.288	1.282	0.007	845	356	-23.9	0.37	0.38	0.19	1.9	115	10	304	3	0	0	75	1012	7
6	12	20	354	12	98.1	0.301	1.356	0.007	916	380	-25.1	0.37	0.38	0.19	2	115	10	304.6	3	0	0	70	1010	7
6	12	20	354	13	80	0.296	1.293	0.007	973	370	-29.2	0.37	0.38	0.19	2	96	10	303.4	3	0	0	66	1010	8
6	12	20	354	14	17.4	0.232	0.78	0.007	982	258	-64.6	0.37	0.38	0.19	1.7	112	10	300	3	0	1.52	97	1009	10
6	12	20	354	15	24.8	0.238	0.884	0.007	1000	267	-48.9	0.37	0.38	0.19	1.7	107	10	300.4	3	0	0	94	1009	10
6	12	20	354	16	13.3	0.195	0.72	0.007	1010	199	-50.6	0.37	0.38	0.22	1.4	103	10	300.6	3	0	0	94	1009	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	20	354	17	0.1	0.122	0.141	0.007	1008	99	-1641.4	0.37	0.38	0.3	1	100	10	299.6	3	0	0	91	1009	10
6	12	20	354	18	-2.2	0.061	-9	-9	-999	35	9.3	0.37	0.38	0.6	1	93	10	299	3	0	0	94	1010	7
6	12	20	354	19	-2.5	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	298.5	3	0	0	88	1010	7
6	12	20	354	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	72	10	298.2	3	0	0	97	1011	7
6	12	20	354	21	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	94	10	297.9	3	0	0	94	1011	7
6	12	20	354	22	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	86	10	297.6	3	0	0	100	1012	7
6	12	20	354	23	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	75	10	297.1	3	0	0	100	1012	7
6	12	20	354	24	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	88	10	297.2	3	0	0	100	1011	7
6	12	21	355	1	-5.7	0.091	-9	-9	-999	63	11.8	0.37	0.38	1	1.5	134	10	297.2	3	0	5.08	100	1011	7
6	12	21	355	2	-0.7	0.03	-9	-9	-999	14	3.4	0.37	0.38	1	0.5	89	10	297.1	3	0	0	100	1010	0
6	12	21	355	3	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	41	10	297.1	3	0	0	100	1010	7
6	12	21	355	4	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	44	10	296.9	3	0	0	100	1011	7
6	12	21	355	5	-0.8	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	58	10	296.9	3	0	0	100	1011	7
6	12	21	355	6	-1	0.037	-9	-9	-999	16	4.7	0.655	0.64	1	0.5	63	10	296.9	3	0	0	100	1012	3
6	12	21	355	7	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	0.68	0.7	92	10	298	3	0	0.25	100	1013	0
6	12	21	355	8	24.4	0.161	0.53	0.005	219	149	-15.5	0.37	0.38	0.32	1	89	10	300.8	3	0	0	91	1014	0
6	12	21	355	9	49.5	0.241	0.82	0.005	403	272	-25.5	0.37	0.38	0.22	1.6	90	10	302.2	3	0	0	80	1014	7
6	12	21	355	10	69	0.27	1.08	0.005	660	323	-25.9	0.37	0.38	0.2	1.8	102	10	303	3	0	0	79	1014	8
6	12	21	355	11	78.5	0.295	1.213	0.005	821	369	-29.6	0.37	0.38	0.19	2	109	10	303.2	3	0	0	70	1013	8
6	12	21	355	12	110.5	0.337	1.405	0.005	906	451	-31.4	0.37	0.38	0.19	2.3	109	10	304.5	3	0	0	65	1013	6
6	12	21	355	13	89.1	0.342	1.339	0.005	974	461	-40.7	0.37	0.38	0.19	2.4	119	10	303.9	3	0	0	66	1012	8
6	12	21	355	14	50	0.295	1.119	0.005	1011	370	-46.5	0.37	0.38	0.19	2.1	114	10	303.5	3	0	0	70	1011	9
6	12	21	355	15	33.2	0.276	0.984	0.005	1036	334	-57.1	0.37	0.38	0.19	2	117	10	302.9	3	0	0	65	1011	10
6	12	21	355	16	13.7	0.207	0.736	0.005	1045	217	-57.8	0.37	0.38	0.22	1.5	103	10	301.9	3	0	0	75	1010	10
6	12	21	355	17	0.1	0.146	0.143	0.005	1044	129	-2815.2	0.37	0.38	0.29	1.2	90	10	300.6	3	0	0	75	1010	10
6	12	21	355	18	-1.4	0.049	-9	-9	-999	32	7.6	0.37	0.38	0.6	0.8	108	10	299.4	3	0	0	82	1011	7
6	12	21	355	19	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	101	10	298.8	3	0	0	94	1011	7
6	12	21	355	20	-2.4	0.055	-9	-9	-999	29	6.2	0.37	0.38	1	0.9	96	10	298.5	3	0	0	94	1012	0
6	12	21	355	21	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	78	10	298.2	3	0	0	94	1012	7
6	12	21	355	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	87	10	297.9	3	0	0	94	1013	7
6	12	21	355	23	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	77	10	297.5	3	0	0	97	1013	7
6	12	21	355	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	297.1	3	0	0	98	1012	3
6	12	22	356	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	297.1	3	0	0	100	1011	3
6	12	22	356	2	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	90	10	296.9	3	0	1.27	100	1011	3
6	12	22	356	3	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	72	10	296.9	3	0	0	100	1011	0
6	12	22	356	4	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	67	10	296.5	3	0	0	100	1011	3
6	12	22	356	5	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	57	10	296.4	3	0	0	100	1011	7
6	12	22	356	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	54	10	296.4	3	0	0	100	1012	7
6	12	22	356	7	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	0.68	0.8	72	10	299	3	0	0	100	1013	0
6	12	22	356	8	60.1	0.262	1.009	0.005	617	308	-27	0.655	0.64	0.31	1.4	76	10	301.8	3	0	0	94	1013	0
6	12	22	356	9	101.6	0.303	1.356	0.005	888	384	-24.8	0.655	0.64	0.21	1.6	82	10	303	3	0	0	75	1014	0
6	12	22	356	10	70.3	0.271	1.226	0.005	949	324	-25.5	0.37	0.38	0.2	1.8	94	10	303	3	0	0	70	1013	8
6	12	22	356	11	42.6	0.27	1.051	0.005	982	323	-41.8	0.37	0.38	0.19	1.9	109	10	300.8	3	0	1.78	70	1013	10
6	12	22	356	12	49	0.23	1.115	0.006	1021	254	-22.4	0.37	0.38	0.19	1.5	99	10	300.9	3	0	0	94	1012	9
6	12	22	356	13	49.3	0.252	1.131	0.005	1059	290	-29.1	0.37	0.38	0.19	1.7	86	10	301.5	3	0	0	94	1011	9
6	12	22	356	14	61.7	0.301	1.237	0.005	1107	381	-40	0.655	0.64	0.18	1.7	75	10	301.2	3	0	0	100	1010	10
6	12	22	356	15	54.7	0.285	1.205	0.005	1151	351	-38.2	0.655	0.64	0.19	1.6	83	10	302.6	3	0	0	94	1010	9
6	12	22	356	16	21.5	0.239	0.887	0.005	1167	269	-57	0.655	0.64	0.21	1.4	79	10	301.9	3	0	0	91	1010	10
6	12	22	356	17	0.1	0.194	0.148	0.005	1164	198	-6631.1	0.37	0.38	0.29	1.6	117	10	300	3	0	1.27	85	1011	10

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	22	356	18	-2.1	0.061	-9	-9	-999	52	9.4	0.37	0.38	0.59	1	89	10	297.8	3	0	3.05	88	1012	7
6	12	22	356	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	85	10	297.8	3	0	0	94	1012	7
6	12	22	356	20	-4.1	0.081	-9	-9	-999	53	11.6	0.655	0.64	1	1.1	76	10	297.9	3	0	0	97	1013	7
6	12	22	356	21	-4.1	0.081	-9	-9	-999	53	11.5	0.655	0.64	1	1.1	76	10	297.1	3	0	3.56	100	1013	7
6	12	22	356	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	96	10	297.5	3	0	0.25	100	1013	7
6	12	22	356	23	-0.8	0.037	-9	-9	-999	16	5.3	0.655	0.64	1	0.5	77	10	297.5	3	0	0	100	1013	7
6	12	22	356	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	64	10	297.5	3	0	0	94	1013	7
6	12	23	357	1	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	65	10	297.4	3	0	0	100	1012	7
6	12	23	357	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	70	10	297.1	3	0	0	94	1011	7
6	12	23	357	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	69	10	297	3	0	0	100	1011	3
6	12	23	357	4	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	82	10	297.1	3	0	0	94	1011	3
6	12	23	357	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	56	10	296.8	3	0	0	97	1012	0
6	12	23	357	6	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	105	10	297.2	3	0	0	100	1012	3
6	12	23	357	7	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	0.69	0.9	88	10	299.4	3	0	0	100	1013	0
6	12	23	357	8	31.9	0.177	0.574	0.005	214	171	-15.7	0.37	0.38	0.32	1.1	93	10	301.4	3	0	0	91	1014	0
6	12	23	357	9	61.7	0.278	0.898	0.005	425	338	-31.6	0.37	0.38	0.22	1.9	113	10	302.1	3	0	0	80	1014	0
6	12	23	357	10	93.3	0.311	1.244	0.005	747	398	-29.1	0.37	0.38	0.2	2.1	114	10	303.4	3	0	0	75	1014	0
6	12	23	357	11	104.9	0.336	1.373	0.005	893	448	-32.6	0.37	0.38	0.19	2.3	113	10	303.8	3	0	0	70	1014	6
6	12	23	357	12	97.8	0.301	1.37	0.005	951	381	-25.2	0.37	0.38	0.19	2	110	10	304	3	0	0	70	1013	7
6	12	23	357	13	56.2	0.298	1.153	0.005	984	375	-42.5	0.37	0.38	0.19	2.1	100	10	303.2	3	0	0	65	1012	9
6	12	23	357	14	63.8	0.29	1.218	0.005	1022	360	-34.5	0.37	0.38	0.19	2	104	10	303.6	3	0	0	63	1011	9
6	12	23	357	15	35.7	0.245	1.011	0.005	1042	280	-37.1	0.37	0.38	0.19	1.7	102	10	302.9	3	0	0	63	1010	10
6	12	23	357	16	21.1	0.235	0.852	0.005	1059	262	-55.6	0.37	0.38	0.21	1.7	86	10	301.9	3	0	0	70	1010	10
6	12	23	357	17	0.1	0.177	0.143	0.005	1054	171	-4961.8	0.655	0.64	0.28	1.2	82	10	300.4	3	0	0	74	1010	10
6	12	23	357	18	-2.7	0.073	-9	-9	-999	51	13	0.655	0.64	0.58	1	72	10	299.4	3	0	0	82	1011	7
6	12	23	357	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	73	10	298.9	3	0	0	82	1011	7
6	12	23	357	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	77	10	298.2	3	0	0	85	1012	7
6	12	23	357	21	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	77	10	297.8	3	0	0	82	1012	7
6	12	23	357	22	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	297.6	3	0	0	88	1012	7
6	12	23	357	23	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	84	10	297.5	3	0	0	82	1013	7
6	12	23	357	24	-1.7	0.051	-9	-9	-999	27	7.4	0.655	0.64	1	0.7	58	10	297.5	3	0	0	94	1012	7
6	12	24	358	1	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	89	10	297.1	3	0	0	94	1012	7
6	12	24	358	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	79	10	297	3	0	0	97	1011	7
6	12	24	358	3	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	81	10	296.9	3	0	0	100	1011	7
6	12	24	358	4	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	79	10	297	3	0	0	94	1011	7
6	12	24	358	5	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	90	10	297.5	3	0	0	88	1012	7
6	12	24	358	6	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	71	10	297.4	3	0	0	94	1012	7
6	12	24	358	7	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	0.69	1	86	10	297.8	3	0	0	85	1013	0
6	12	24	358	8	26.8	0.191	0.488	0.005	156	192	-23.5	0.655	0.64	0.31	1	80	10	299.4	3	0	0	85	1014	0
6	12	24	358	9	58.6	0.255	0.752	0.005	262	297	-25.7	0.37	0.38	0.22	1.7	98	10	301.9	3	0	0	88	1014	5
6	12	24	358	10	72.6	0.305	0.925	0.005	394	387	-35.2	0.37	0.38	0.2	2.1	107	10	303	3	0	0	75	1014	7
6	12	24	358	11	55.6	0.309	0.912	0.005	493	394	-47.8	0.37	0.38	0.19	2.2	104	10	302	3	0	0	67	1013	9
6	12	24	358	12	48.2	0.295	1.118	0.005	1048	368	-47.9	0.37	0.38	0.19	2.1	103	10	301.9	3	0	0	75	1013	10
6	12	24	358	13	48.1	0.284	1.129	0.005	1082	348	-42.9	0.37	0.38	0.19	2	110	10	301.4	3	0	0	65	1012	10
6	12	24	358	14	58.3	0.288	1.221	0.005	1126	356	-37.1	0.37	0.38	0.19	2	105	10	302.4	3	0	0.25	72	1011	9
6	12	24	358	15	22.7	0.28	0.896	0.005	1141	341	-87	0.37	0.38	0.19	2.1	103	10	301.4	3	0	0	70	1010	10
6	12	24	358	16	17.1	0.243	0.818	0.005	1153	275	-75.3	0.37	0.38	0.21	1.8	104	10	301	3	0	0	79	1011	10
6	12	24	358	17	0.1	0.146	0.148	0.005	1152	132	-2816.1	0.37	0.38	0.29	1.2	97	10	300	3	0	0	79	1011	10
6	12	24	358	18	-2.5	0.067	-9	-9	-999	42	10.8	0.37	0.38	0.58	1.1	86	10	298.8	3	0	0	82	1011	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	24	358	19	-2.7	0.066	-9	-9	-999	39	9.5	0.655	0.64	1	0.9	76	10	297.9	3	0	0	100	1011	7
6	12	24	358	20	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	85	10	297.4	3	0	0	94	1012	7
6	12	24	358	21	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	79	10	297.1	3	0	0	94	1012	7
6	12	24	358	22	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	78	10	296.6	3	0	0	94	1012	7
6	12	24	358	23	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	73	10	296.2	3	0	0	100	1012	7
6	12	24	358	24	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	66	10	296.2	3	0	0	100	1012	7
6	12	25	359	1	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	56	10	296.2	3	0	0	100	1011	7
6	12	25	359	2	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	61	10	296.4	3	0	0	100	1010	7
6	12	25	359	3	-0.9	0.037	-9	-9	-999	16	5.2	0.655	0.64	1	0.5	68	10	295.8	3	0	0	100	1010	7
6	12	25	359	4	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	83	10	295.9	3	0	0	97	1011	7
6	12	25	359	5	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	88	10	296.4	3	0	0	100	1011	7
6	12	25	359	6	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	81	10	296.2	3	0	0	100	1012	7
6	12	25	359	7	-3.9	0.073	-9	-9	-999	46	9.2	0.655	0.64	0.69	1	81	10	298.8	3	0	0	100	1013	0
6	12	25	359	8	36.4	0.236	0.584	0.005	197	264	-32.8	0.655	0.64	0.31	1.3	82	10	300.5	3	0	0	91	1013	0
6	12	25	359	9	95.3	0.261	1.221	0.005	690	307	-16.9	0.655	0.64	0.21	1.3	68	10	301.4	3	0	0	77	1014	0
6	12	25	359	10	137.5	0.352	1.473	0.005	841	481	-28.7	0.655	0.64	0.19	1.9	85	10	302.8	3	0	0	77	1013	0
6	12	25	359	11	100.8	0.313	1.38	0.005	943	403	-27.5	0.37	0.38	0.19	2.1	104	10	303	3	0	0	75	1013	6
6	12	25	359	12	119.1	0.318	1.519	0.005	1065	412	-24.3	0.37	0.38	0.19	2.1	106	10	304.1	3	0	0	70	1012	5
6	12	25	359	13	82.8	0.297	1.381	0.005	1148	372	-28.5	0.37	0.38	0.19	2	101	10	303.9	3	0	0	70	1011	8
6	12	25	359	14	76.3	0.295	1.373	0.005	1225	368	-30.2	0.37	0.38	0.19	2	102	10	303.6	3	0	0	63	1010	8
6	12	25	359	15	25.7	0.271	0.963	0.005	1249	325	-69.8	0.37	0.38	0.19	2	108	10	302.8	3	0	0	75	1010	10
6	12	25	359	16	18.4	0.244	0.865	0.005	1265	277	-70.7	0.37	0.38	0.21	1.8	102	10	301.4	3	0	0	70	1010	10
6	12	25	359	17	0.1	0.17	0.152	0.005	1260	163	-4449.3	0.37	0.38	0.29	1.4	114	10	299.5	3	0	0	74	1010	10
6	12	25	359	18	-2.5	0.061	-9	-9	-999	43	8.1	0.37	0.38	0.58	1	100	10	298.4	3	0	0	88	1010	3
6	12	25	359	19	-4.1	0.073	-9	-9	-999	45	8.4	0.37	0.38	1	1.2	86	10	297.9	3	0	0.25	94	1011	3
6	12	25	359	20	-2.6	0.061	-9	-9	-999	34	7.9	0.37	0.38	1	1	87	10	296.9	3	0	0	100	1012	7
6	12	25	359	21	-3.4	0.073	-9	-9	-999	46	10.5	0.655	0.64	1	1	67	10	296.6	3	0	0.76	100	1012	7
6	12	25	359	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	296.5	3	0	0	94	1012	7
6	12	25	359	23	-0.7	0.03	-9	-9	-999	12	3.5	0.37	0.38	1	0.5	98	10	296.5	3	0	0	94	1012	3
6	12	25	359	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	296.2	3	0	0	94	1011	3
6	12	26	360	1	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	295.9	3	0	0	94	1010	3
6	12	26	360	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	74	10	295.8	3	0	0	100	1010	7
6	12	26	360	3	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	112	10	296.1	3	0	0.25	94	1010	7
6	12	26	360	4	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	122	10	295.9	3	0	0.25	90	1010	7
6	12	26	360	5	-1.6	0.049	-9	-9	-999	25	6.3	0.37	0.38	1	0.8	100	10	295.9	3	0	0	100	1011	7
6	12	26	360	6	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	101	10	296	3	0	0	97	1012	7
6	12	26	360	7	-3.1	0.066	-9	-9	-999	39	8.3	0.655	0.64	0.7	0.9	84	10	298.8	3	0	0	97	1013	0
6	12	26	360	8	57.5	0.248	0.636	0.005	161	283	-23.9	0.655	0.64	0.31	1.3	85	10	300.9	3	0	0	82	1014	0
6	12	26	360	9	74.7	0.305	1.068	0.005	590	387	-34.3	0.37	0.38	0.22	2.1	91	10	302	3	0	0	74	1014	0
6	12	26	360	10	89.7	0.299	1.32	0.011	929	376	-26.9	0.37	0.38	0.2	2	93	10	302.6	3	0	0	74	1014	5
6	12	26	360	11	99.5	0.324	1.441	0.018	1087	423	-30.7	0.37	0.38	0.19	2.2	103	10	302.9	3	0	0	72	1013	6
6	12	26	360	12	103.8	0.292	1.483	0.018	1135	364	-21.7	0.37	0.38	0.19	1.9	104	10	303.2	3	0	0	63	1012	7
6	12	26	360	13	71.1	0.282	1.32	0.017	1167	344	-28.4	0.37	0.38	0.19	1.9	101	10	302.9	3	0	0	63	1011	9
6	12	26	360	14	46.8	0.261	1.155	0.017	1188	307	-34.3	0.37	0.38	0.19	1.8	107	10	301.9	3	0	0	67	1010	9
6	12	26	360	15	32.6	0.297	1.028	0.017	1202	373	-72.7	0.37	0.38	0.19	2.2	106	10	301.1	3	0	0	70	1010	10
6	12	26	360	16	18	0.243	0.846	0.016	1209	277	-72	0.37	0.38	0.21	1.8	105	10	300.4	3	0	0	88	1010	10
6	12	26	360	17	0.1	0.17	0.15	0.016	1209	163	-4452.3	0.37	0.38	0.29	1.4	105	10	299.6	3	0	0	82	1011	10
6	12	26	360	18	-2	0.061	-9	-9	-999	43	10.1	0.37	0.38	0.57	1	126	10	298.5	3	0	0	82	1011	7
6	12	26	360	19	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	112	10	298.2	3	0	0	88	1012	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	26	360	20	-2.1	0.055	-9	-9	-999	29	7.1	0.37	0.38	1	0.9	92	10	297.5	3	0	0	94	1012	7
6	12	26	360	21	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	86	10	297	3	0	0	90	1012	7
6	12	26	360	22	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	92	10	296.8	3	0	0	90	1012	7
6	12	26	360	23	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	93	10	296.4	3	0	0	94	1012	7
6	12	26	360	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	296	3	0	0	97	1012	3
6	12	27	361	1	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	89	10	295.8	3	0	0	90	1011	3
6	12	27	361	2	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	78	10	295.4	3	0	0	100	1011	7
6	12	27	361	3	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	87	10	295	3	0	0	96	1011	7
6	12	27	361	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	94	10	294.9	3	0	0	93	1012	3
6	12	27	361	5	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	94	10	295.1	3	0	0	97	1012	3
6	12	27	361	6	-2.5	0.059	-9	-9	-999	33	7.4	0.655	0.64	1	0.8	72	10	295.9	3	0	0	93	1013	3
6	12	27	361	7	-3.1	0.066	-9	-9	-999	39	8.3	0.655	0.64	0.7	0.9	78	10	298.4	3	0	0	93	1014	0
6	12	27	361	8	63.7	0.21	0.784	0.005	273	221	-13.1	0.655	0.64	0.32	1	84	10	301.5	3	0	0	85	1015	0
6	12	27	361	9	42	0.205	1.032	0.005	945	213	-18.5	0.37	0.38	0.22	1.3	89	10	301.8	3	0	0	79	1015	8
6	12	27	361	10	91.9	0.343	1.387	0.005	1051	463	-39.8	0.37	0.38	0.2	2.4	116	10	302.2	3	0	0	74	1015	4
6	12	27	361	11	93.4	0.311	1.434	0.006	1142	399	-29.1	0.37	0.38	0.19	2.1	111	10	303.1	3	0	0	67	1014	7
6	12	27	361	12	96.2	0.323	1.472	0.006	1199	421	-31.5	0.37	0.38	0.19	2.2	108	10	303.1	3	0	0	65	1013	7
6	12	27	361	13	90.3	0.288	1.463	0.006	1253	356	-23.9	0.37	0.38	0.19	1.9	109	10	303.8	3	0	0	65	1012	8
6	12	27	361	14	69.9	0.314	1.358	0.006	1294	405	-40.1	0.37	0.38	0.19	2.2	120	10	303.4	3	0	0	63	1012	9
6	12	27	361	15	31.5	0.286	1.046	0.006	1311	352	-66.7	0.37	0.38	0.19	2.1	122	10	301.6	3	0	0	67	1012	10
6	12	27	361	16	9.7	0.202	0.708	0.006	1316	211	-76.5	0.37	0.38	0.21	1.5	104	10	300.8	3	0	0	72	1012	10
6	12	27	361	17	0.1	0.146	0.154	0.006	1314	129	-2818.9	0.37	0.38	0.29	1.2	105	10	299.4	3	0	0	74	1012	10
6	12	27	361	18	-2	0.055	-9	-9	-999	34	7.5	0.37	0.38	0.57	0.9	101	10	298.4	3	0	0	82	1012	3
6	12	27	361	19	-2.4	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	85	10	297.9	3	0	0	94	1013	3
6	12	27	361	20	-2.9	0.061	-9	-9	-999	34	6.9	0.37	0.38	1	1	88	10	297.2	3	0	0	91	1013	0
6	12	27	361	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	93	10	297	3	0	0	88	1014	3
6	12	27	361	22	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	93	10	297.2	3	0	0	88	1014	3
6	12	27	361	23	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	101	10	297.1	3	0	0	94	1014	3
6	12	27	361	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	296.6	3	0	0	94	1013	3
6	12	28	362	1	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	70	10	296.2	3	0	0	94	1013	3
6	12	28	362	2	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	65	10	295.6	3	0	0	97	1012	3
6	12	28	362	3	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	64	10	295.6	3	0	0	94	1012	3
6	12	28	362	4	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	81	10	296	3	0	0	100	1013	3
6	12	28	362	5	-3.9	0.073	-9	-9	-999	46	9.1	0.655	0.64	1	1	81	10	296.1	3	0	0	100	1013	0
6	12	28	362	6	-3.1	0.067	-9	-9	-999	40	8.7	0.37	0.38	1	1.1	91	10	296.4	3	0	0	100	1014	7
6	12	28	362	7	-5	0.079	-9	-9	-999	51	9	0.37	0.38	0.72	1.3	105	10	297.4	3	0	0	100	1015	0
6	12	28	362	8	37.2	0.18	0.605	0.005	215	176	-14.2	0.37	0.38	0.32	1.1	95	10	300.2	3	0	0	94	1016	0
6	12	28	362	9	67.4	0.281	1.13	0.005	776	342	-29.7	0.37	0.38	0.22	1.9	111	10	301.9	3	0	0	79	1016	0
6	12	28	362	10	92.1	0.321	1.308	0.005	880	419	-32.6	0.37	0.38	0.2	2.2	106	10	302.9	3	0	0	75	1015	4
6	12	28	362	11	113.6	0.338	1.464	0.005	1002	452	-30.8	0.37	0.38	0.19	2.3	112	10	303.9	3	0	0	72	1015	4
6	12	28	362	12	119	0.329	1.548	0.005	1129	433	-27	0.37	0.38	0.19	2.2	107	10	304	3	0	0	63	1014	5
6	12	28	362	13	110.6	0.327	1.562	0.005	1248	429	-28.4	0.37	0.38	0.19	2.2	109	10	304.4	3	0	0	63	1013	7
6	12	28	362	14	71.3	0.336	1.38	0.005	1331	449	-48.2	0.37	0.38	0.19	2.4	108	10	303.6	3	0	0	61	1012	9
6	12	28	362	15	12.9	0.239	0.781	0.005	1334	272	-95	0.37	0.38	0.19	1.8	86	10	298.4	3	0	2.03	100	1013	10
6	12	28	362	16	14.1	0.142	0.812	0.005	1364	127	-18.3	0.37	0.38	0.21	0.9	96	10	299.5	3	0	0	88	1012	10
6	12	28	362	17	0.1	0.122	0.156	0.005	1360	98	-1645.7	0.37	0.38	0.29	1	89	10	298.5	3	0	0	88	1012	10
6	12	28	362	18	-2.6	0.073	-9	-9	-999	46	13.9	0.655	0.64	0.56	1	79	10	298	3	0	0	100	1013	7
6	12	28	362	19	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	70	10	297.4	3	0	0	94	1013	3
6	12	28	362	20	-1.7	0.051	-9	-9	-999	27	7.3	0.655	0.64	1	0.7	68	10	296.4	3	0	0	100	1014	7

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	28	362	21	-2.5	0.059	-9	-9	-999	33	7.5	0.655	0.64	1	0.8	64	10	296.2	3	0	0	100	1014	3
6	12	28	362	22	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	74	10	295.9	3	0	0.25	100	1013	3
6	12	28	362	23	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	75	10	295.4	3	0	0	94	1013	3
6	12	28	362	24	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	56	10	295.1	3	0	0	100	1013	3
6	12	29	363	1	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	71	10	295	3	0	0	97	1012	0
6	12	29	363	2	-999	-9	-9	-9	-999	-999	-99999	0.655	0.64	1	0.7	72	10	294.9	3	0	0	97	1012	99
6	12	29	363	3	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	80	10	294.9	3	0	0	100	1012	3
6	12	29	363	4	-1	0.036	-9	-9	-999	16	4.2	0.37	0.38	1	0.6	96	10	294.6	3	0	0	93	1012	3
6	12	29	363	5	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	294.9	3	0	0	93	1013	3
6	12	29	363	6	-2.2	0.059	-9	-9	-999	33	8.4	0.655	0.64	1	0.8	73	10	295.6	3	0	0	100	1013	7
6	12	29	363	7	-3.5	0.067	-9	-9	-999	40	7.6	0.37	0.38	0.72	1.1	104	10	297.8	3	0	0	100	1015	0
6	12	29	363	8	46.8	0.218	0.573	0.005	145	234	-20	0.37	0.38	0.33	1.4	98	10	301	3	0	0	97	1015	0
6	12	29	363	9	78.5	0.241	0.926	0.005	366	272	-16.1	0.37	0.38	0.22	1.5	98	10	302.9	3	0	0	88	1015	0
6	12	29	363	10	92	0.289	1.315	0.005	896	356	-23.6	0.37	0.38	0.2	1.9	95	10	303.4	3	0	0	75	1015	0
6	12	29	363	11	94.7	0.322	1.378	0.005	1000	420	-31.9	0.37	0.38	0.19	2.2	107	10	303.1	3	0	0	67	1015	7
6	12	29	363	12	95	0.333	1.41	0.005	1067	443	-35.3	0.37	0.38	0.19	2.3	114	10	303.4	3	0	0	65	1014	7
6	12	29	363	13	91.4	0.321	1.419	0.005	1131	419	-32.7	0.37	0.38	0.19	2.2	107	10	303.4	3	0	0	65	1013	8
6	12	29	363	14	47	0.337	1.148	0.005	1162	451	-73.8	0.37	0.38	0.19	2.5	92	10	302.4	3	0	0	61	1012	9
6	12	29	363	15	34.4	0.309	1.042	0.005	1187	396	-77.5	0.37	0.38	0.19	2.3	102	10	302.6	3	0	0	63	1012	10
6	12	29	363	16	17.3	0.243	0.831	0.005	1197	276	-74.7	0.37	0.38	0.21	1.8	100	10	301.4	3	0	0	74	1012	10
6	12	29	363	17	0.1	0.17	0.149	0.005	1195	163	-4456.7	0.37	0.38	0.29	1.4	102	10	299.9	3	0	0	72	1012	10
6	12	29	363	18	-1.9	0.055	-9	-9	-999	41	7.6	0.37	0.38	0.56	0.9	104	10	298.5	3	0	0	77	1012	3
6	12	29	363	19	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	297.9	3	0	0	85	1013	3
6	12	29	363	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	79	10	297.4	3	0	0	94	1013	0
6	12	29	363	21	-2.3	0.055	-9	-9	-999	29	6.3	0.37	0.38	1	0.9	90	10	297.2	3	0	0	94	1013	3
6	12	29	363	22	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	297.2	3	0	0	94	1013	3
6	12	29	363	23	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	68	10	296.9	3	0	0	100	1013	3
6	12	29	363	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	84	10	296.9	3	0	0	100	1013	3
6	12	30	364	1	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	296.5	3	0	0	88	1012	3
6	12	30	364	2	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	97	10	296.5	3	0	0	97	1012	3
6	12	30	364	3	-1.4	0.042	-9	-9	-999	20	4.9	0.37	0.38	1	0.7	86	10	296.4	3	0	0	100	1011	3
6	12	30	364	4	-0.9	0.036	-9	-9	-999	16	4.7	0.37	0.38	1	0.6	90	10	295.9	3	0	0	94	1012	7
6	12	30	364	5	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	66	10	295.4	3	0	0	97	1012	0
6	12	30	364	6	-1.2	0.044	-9	-9	-999	21	6.3	0.655	0.64	1	0.6	76	10	295.6	3	0	0	97	1013	7
6	12	30	364	7	-3.2	0.066	-9	-9	-999	39	8.3	0.655	0.64	0.72	0.9	85	10	299	3	0	0	97	1014	0
6	12	30	364	8	41.5	0.248	0.564	0.005	156	284	-33.2	0.37	0.38	0.33	1.7	90	10	301	3	0	0	85	1015	0
6	12	30	364	9	74.7	0.294	1.002	0.005	487	367	-30.8	0.37	0.38	0.22	2	95	10	302.4	3	0	0	79	1015	0
6	12	30	364	10	91	0.288	1.262	0.007	799	356	-23.8	0.37	0.38	0.2	1.9	94	10	303.4	3	0	0	70	1014	4
6	12	30	364	11	72.2	0.261	1.19	0.007	845	307	-22.2	0.37	0.38	0.19	1.7	95	10	303	3	0	0	67	1014	8
6	12	30	364	12	60.5	0.267	1.138	0.007	882	317	-28.5	0.37	0.38	0.19	1.8	119	10	301.4	3	0	0.25	76	1013	9
6	12	30	364	13	44.5	0.282	1.038	0.007	907	344	-45.5	0.37	0.38	0.19	2	95	10	298.6	3	0	2.29	85	1013	10
6	12	30	364	14	86.8	0.298	1.323	0.007	964	374	-27.5	0.37	0.38	0.19	2	99	10	301.8	3	0	0	94	1011	8
6	12	30	364	15	30.7	0.285	0.941	0.007	981	350	-68.2	0.37	0.38	0.19	2.1	105	10	299.4	3	0	0.76	999	1012	10
6	12	30	364	16	5.1	0.14	0.517	0.007	982	133	-48.8	0.37	0.38	0.21	1	102	10	297.9	3	0	0	999	1012	10
6	12	30	364	17	0.1	0.118	0.14	0.007	983	94	-1498.9	0.655	0.64	0.28	0.8	74	10	298.1	3	0	0	999	1012	10
6	12	30	364	18	-0.9	0.044	-9	-9	-999	24	8.6	0.655	0.64	0.55	0.6	81	10	297.6	3	0	0	94	1012	7
6	12	30	364	19	-1.3	0.042	-9	-9	-999	20	5.5	0.37	0.38	1	0.7	99	10	297.2	3	0	0	100	1013	7
6	12	30	364	20	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	53	10	296.8	3	0	0	100	1013	3
6	12	30	364	21	-1.4	0.044	-9	-9	-999	21	5.6	0.655	0.64	1	0.6	63	10	296.2	3	0	0	100	1013	3

yr	mo	dy	jd	hr	SensHtFlx (W/m2)	u*	w*	gradTh (K/m)	zic(m)	zim(m)	L(m)	z0(m)	B0	a	uspd (m/s)	udir	u-ht (m)	T(K)	T-ht (m)	Pcp Code	Pcp (mm)	RH	SfcPres	Cloud Cover
6	12	30	364	22	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	74	10	296.1	3	0	0	100	1013	3
6	12	30	364	23	-3.1	0.066	-9	-9	-999	39	8.4	0.655	0.64	1	0.9	79	10	296.2	3	0	0	100	1013	3
6	12	30	364	24	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	76	10	296.4	3	0	0	100	1012	3
6	12	31	365	1	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	81	10	296.1	3	0	0	100	1012	3
6	12	31	365	2	-1.9	0.051	-9	-9	-999	27	6.5	0.655	0.64	1	0.7	85	10	296	3	0	0	100	1011	3
6	12	31	365	3	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	109	10	295.9	3	0	0	100	1011	3
6	12	31	365	4	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	107	10	295.9	3	0	0	100	1011	3
6	12	31	365	5	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	80	10	295.6	3	0	0	97	1012	0
6	12	31	365	6	-1.8	0.049	-9	-9	-999	25	5.6	0.37	0.38	1	0.8	91	10	295.9	3	0	0	100	1012	3
6	12	31	365	7	-1.9	0.049	-9	-9	-999	25	5.5	0.37	0.38	0.73	0.8	90	10	299	3	0	0	97	1013	0
6	12	31	365	8	40.5	0.193	0.755	0.005	385	195	-16	0.37	0.38	0.33	1.2	90	10	301.4	3	0	0	91	1014	0
6	12	31	365	9	80.7	0.275	1.18	0.005	736	331	-23.2	0.37	0.38	0.22	1.8	110	10	302.5	3	0	0	85	1014	0
6	12	31	365	10	91	0.288	1.31	0.007	894	356	-23.8	0.37	0.38	0.2	1.9	111	10	303.2	3	0	0	79	1014	4
6	12	31	365	11	104.9	0.293	1.398	0.006	943	364	-21.6	0.37	0.38	0.19	1.9	101	10	303.8	3	0	0	65	1014	6
6	12	31	365	12	109.2	0.305	1.449	0.005	1007	387	-23.4	0.37	0.38	0.19	2	95	10	304.1	3	0	0	65	1013	7
6	12	31	365	13	96.7	0.312	1.428	0.005	1089	400	-28.3	0.37	0.38	0.19	2.1	106	10	304	3	0	0	65	1012	8
6	12	31	365	14	58.8	0.299	1.229	0.005	1139	377	-41.1	0.37	0.38	0.19	2.1	100	10	303.8	3	0	0	65	1012	9
6	12	31	365	15	29.6	0.285	0.984	0.005	1163	349	-70.2	0.37	0.38	0.19	2.1	108	10	303	3	0	0	59	1011	10
6	12	31	365	16	22.4	0.258	0.902	0.005	1180	301	-68.9	0.37	0.38	0.21	1.9	108	10	302.1	3	0	0	67	1011	10
6	12	31	365	17	0.1	0.158	0.149	0.005	1176	148	-3574	0.37	0.38	0.28	1.3	113	10	300	3	0	0	74	1012	10
6	12	31	365	18	-1.9	0.055	-9	-9	-999	38	7.8	0.37	0.38	0.55	0.9	103	10	298.5	3	0	0	82	1012	3
6	12	31	365	19	-2.9	0.061	-9	-9	-999	34	7	0.37	0.38	1	1	93	10	297.9	3	0	0	88	1012	3
6	12	31	365	20	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	68	10	297.4	3	0	0	91	1013	0
6	12	31	365	21	-2.5	0.059	-9	-9	-999	33	7.3	0.655	0.64	1	0.8	83	10	297	3	0	0	88	1013	0
6	12	31	365	22	-1.4	0.044	-9	-9	-999	21	5.5	0.655	0.64	1	0.6	76	10	296.9	3	0	0	94	1013	0
6	12	31	365	23	-1.9	0.051	-9	-9	-999	27	6.4	0.655	0.64	1	0.7	75	10	296.5	3	0	0	100	1013	0
6	12	31	365	24	-999	-9	-9	-9	-999	-999	-99999	0.542	0.56	1	0	0	10	295.9	2	0	0	100	1013	3

APPENDIX F
CARISAL UNLIMITED APPLICATION FOR CERTIFICATE OF ENVIRONMENTAL CLEARANCE

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SCHEDULE

FORM A (Rule 3(1))

THE CERTIFICATE OF ENVIRONMENTAL CLEARANCE RULES 2001

APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL CLEARANCE

This form must be completed in triplicate for any proposed activity identified in the Schedule of the Certificate of Environmental Clearance (Designated Activities) Order, 2001.

Essential additional information such as plans, maps, diagrams, photographs or text may be included in the application as an appropriately referenced attachment.

To: The Environmental Management Authority,

I/We hereby apply for a Certificate of Environmental Clearance (CEC).

Signed Varesha Besai
Applicant/Applicant's Agent/Applicant's Attorney

VARESHA BESAI
(PRINT NAME)

Signed I. Bertrand
Company Director/ CEO/ Corporate Secretary
(Company Stamp)

IAN BERTRAND
(PRINT NAME)

14 December 2006
Date

CARISAL LIMITED

RECEIVED 22 DEC 2006 EMA

FOR OFFICIAL USE ONLY

Application Received 22/12/06 (Date)

Received by: (Signature)

Ref. No. CEC1743/2006

Acknowledgment Sent..... (Date)

Category of intended activity: (please tick appropriate box)

(i) New ☐ (ii) Modification ☐

(iii) Abandonment/ Decommissioning ☐

PROJECT CLASSIFICATION

Activity ☐☐ Definition ☐☐

Application requires CEC: Y ☐ N ☐ Application requires EIA: Y ☐ N ☐

EMA: CEC 1

ENVIRONMENTAL MANAGEMENT AUTHORITY EMA JAN 10 2008 CERTIFIED COPY

CERTIFICATE OF ENVIRONMENTAL CLEARANCE
APPLICATION FORM

A. GENERAL INFORMATION

1. Name of applicant ***Varesha Besai***
TTeK Project Management, Limited

2. Postal Address ***3 Pelham Street***
Port of Spain
Trinidad & Tobago, W.I.

Electronic mailing address (e-mail address) ***Varesha.besai@ttek-pm.com***

3. Telephone no. ***868.621.0134*** 4. Fax No. ***868.627.6032***

5. Location of proposed activity:

(a) District/Village

Point Lisas Industrial Estate

(b) Street (Name and Lot or LP No.)

Lot 4A south.

6. Do you own the property on which the activity is intended to be carried out?

Y ☐ N ☒

If Yes, please attach certified copies of Proof of ownership.

If No, what is the nature of your interest in this property? Please attach supporting documents, justifying your claim (e.g. lease).

The property for the project site will be leased from the NEC. See Attachment V: NEC Letter of Agreement for Lease of Property.

7. Names and addresses of adjoining property owners:

1. ***Essar Steel Caribbean Ltd***
D205/206
Atlantic Plaza, Level 2
Atlantic Avenue, Point Lisas

2. ***NEC Point Lisas Industrial Estate Property***

See Attachments I and II -Project Area Maps and Photos, and Site Layout, respectively, for area and location.

3. ***Westlake Trinidad Unlimited***
   c/o Rapid Environmental Assessment (2003) Limited
   #25 Sam Boucaud Gardens
   Upper Santa Cruz

8. (a) Previous Application for CEC for this site? Y ☐ N ☒

   (b) If yes, Reference No of most recent application ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

   N/A

9. Activity for which CEC required (state the activity and definition categories under which you are applying -refer to CEC Order) as well as the purpose of the project.

Activity Summary

Activity 08	***Clearing, Excavation, Grading and Land filling***	***Definition: (a)***
Activity 09:	***Waterproofing/Caulking/Paving***	***Definition:****
Activity 12:	***Land Reclamation***	***Definition: (a)***
Activity 13:	***Coastal or Offshore Construction or Modification and Dredging Activities***	***Definition: (a),(c)***
Activity 18:	***Establishment of a Facility for Materials Used in Construction***	***Definition: (a)***
Activity 20:	***Manufacture of Goods and Products other than Petroleum Products, Petrochemicals or Petrochemical Products***	***Definition: (a)***
Activity 23:	***Establishment of a Facility for Non-Metallic Mining and Processing***	***Definition:****
Activity 27:	***Establishment of Infrastructure for Pipeline Systems***	***Definition:****
Activity 33:	***Establishment of Infrastructure for Land Transportation***	***Definition:****
Activity 34:	***Establishment of Infrastructure for Marine Transportation***	***Definition:****
Activity 36:	***Establishment of a Facility for Hazardous or Toxic Substance Handling***	***Definition:****
Activity 38:	***Catchments, Abstraction or Treatment of Potable/Process Water***	***Definition: (a)***
Activity 40:	***Establishment of Water Distribution Systems***	***Definition: (a)***
Activity 41:	***Establishment of Land Drainage and Irrigation Schemes***	***Definition: (a)***

****See Attachment III, Environmental Summary – Designated Activities.***

Purpose: ***The purpose of the project is to build and operate a 70 - 100 thousand metric tones per annum (mpta) calcium chloride plant and to sell the products of the process. Calcium chloride produced at this plant will be primarily sold into two markets:***

- ***The ice melt market (for roads, walkways and parking lots during the winter season) and will be sold in US markets and***
- ***The oil drilling industry - calcium chloride is used in the drilling mud and as a component in completion fluid.***

Caustic soda (50-75 thousand mtpa) will also be produced by this project. It is used as a neutralizer of acids in water treatment, and production of bleach for water treatment. It is intended to be sold in both the local Trinidad and Tobago market and abroad. A portion of the caustic soda may be converted to bleach (sodium hypochlorite) to serve local Trinidad and Tobago markets. Quantities for sodium hypochlorite production are currently being negotiated.

The plant will use waste brine from DESALCOTT as a feedstock to the calcium chloride production process and the process water produced from will be treated and recycled in the CariSal production process.

10. Site Description (physical setting of the proposal, both developed and undeveloped areas)

Give an outline description of the physical features of the site to include information on:

(a) Topography and gradient i.e. generally flat ☒ rolling/undulating terrain ☐ or hilly ☐

(b) Are there any springs or aquifers in or adjacent to the site? Y ☒ N ☐

There are no known springs on or adjacent to the project site. There are presumed water aquifers beneath the site.

(c) Are there any rivers, streams or drainages within or adjacent to the project site? Y ☒ N ☐

There are no known major drainages on the project site. There is a river/stream or drainage 500 meters due north of the project area. There is also a minor drainage that passes through the northern boundary of the project parcel. It is a drainage that appears to originate as surface flow from undulating hills to the east/southeast of the site. The drainage is up to several inches deep by about 3-5 feet (.91 – 1.52 meters) wide and does not include a riparian corridor or riparian vegetation. There is a major drainage ~35-40 meters from the nearest point of the southern site boundary, beyond North Sea Road. Please refer to Attachment II – Site Layout.

(d) Are there any ponds, reservoirs or wetland areas within or contiguous to the project site? Y ☐ N ☒

There are no naturally occurring ponds, reservoirs or wetlands within the project site. There is an adjacent river and riparian area about 500 meters north of the project site; however, it is not contiguous to the project site. There is also a river, stream or drainage to beyond the southern site boundary, as described above. The drainage to the south also is not contiguous to the project site.

(e) What is the predominant soil type? Clay based ☒ Sand ☒ Loam ☐ Alluvial ☐

The soils category is dystric planosols. Planosols are soils with a bleached, temporarily water-saturated topsoil on slowly permeable subsoil. The predominant soil types are sandy clays interspersed with clayey soils.

(f) Is the project located within 5km from the coast ☒ further inland? ☐

The project site is ~1.56 Km from the coast.

(g) Present site land use: Residential ☐ Agricultural ☐ Commercial ☐
Industrial ☒ Forestry ☐

The project site is on abandoned sugar cane-fields in an area designated for industrial use.

11. Estimated project capital (TT dollars)

$375,000,000.00

B. DESCRIPTION OF INTENDED ACTIVITY

12. Description of the Intended Activity, which must include information on:

(a) Total area intended for the activity (ha or m^2): ***11.8 ha***

(b) Percentage of the total surface area allocated to covered space and paved areas (%): ***~ 40-50 percent***

(c) Potable water consumption rate (m^3/day): ***Negligible, only for human consumption (~200 m^3/day)***

(d) Process water consumption rate (m^3/day): ***75 m^3/hr. Process is self-sufficient after start-up – including fire water.***

(e) Project's intended operating capacity (metric tons per annum): ***~70,000 mtpa of CaCl, may be expanded to 100,000 mtpa depending on market response during commercial negotiations.***

(f) Production output rate, if different from above (metric tons per annum): ***Same as above.***

(g) Intended commencement date: ***Second quarter 2008.***

Site Preparation and Construction Phase

13. Does the project site require major earthworks such as clearing ☒ cutting ☒ excavation ☒ grading ☒ blasting ☐ dredging ☒

If yes, state the method of disposal (and disposal site) of material generated as a result.

The site will be initially cleared by using mechanical vegetation cutting equipment. The site will then be graded to be a level pad for installation of foundations. Foundations will require excavation. All grading and excavation material will be reused as backfill on the site.

Dredging may be required for the installation of the caustic soda pipeline leading to the caustic soda storage tank on the Port. CariSal's intent is to design a process with zero discharge; however, excavation and dredging may be required for installation of a waste discharge pipeline to the ocean (~2 Km in length).

(a) Does the site require filling ☒ reclamation ☐ coastline stabilisation/alteration ☒

If yes, state the source and quantity (metric tons) of material required.

Some areas of the project site will be grubbed, filled, graded and compacted for drainage. Fill material will be sourced from excavated material and supplemented with red sand from one of the nearby sand pits.

Topsoil from graded areas will be stock piled and reused for the establishment of perimeter buffers.

Stabilization may be required for the caustic and waste pipelines going to the Port facility and ocean, respectively. Roughly 1/3 to 1/2 of the corridor is likely to be through mangrove.

(b) Would the project require major waterworks such as abstraction ☐
diversion of water courses ☐ creation of standing water bodies ☐

No. Water will be stored in tanks.

If yes, give an estimate of the volume of water to be impounded (m^3) or the rate of abstraction (m^3/day) and the source of this water

(c) Would the site require infrastructure and utility development:

access roads and/or bridges ☒ power generating or transmission facilities ☒
telecommunications ☒ installation or modification of a drainage system ☒

sewage system? ☒

If yes, give details

Access Roads

The access road to the site will be constructed from the currently unnamed road reserve to the east of the project site. In-plant roads will be constructed by CariSal. The unnamed reserve road turns north off of North Sea Drive parallel to and roughly 750 meters east of the Southern Main Road. The facility's access road will be constructed by the NEC as part of site preparation for the estate and will be compacted. CariSal will use the unimproved road until the NEC's road is available. Some compaction and grading may be required.

Power and Transmission
The proposed project will require power from T&TEC. T&TEC will construct the tap line to the project from the power lines that bound the project site on the south and west, or from a proposed new 132 kV line that will be constructed for the Estate. T&TEC will also construct the on-site substation. See Attachment II – Site Layout, Feature 2.

Telecommunications
A telecommunications line will be strung on existing power poles then installed in trenches in local access roads.

Start-up Water and Drainage
The project will purchase water for plant start up from WASA at a rate of 5,000 gallons per day or ~19 cubic meters/day and will produce and recycle process water to run the plant. The project was sited to avoid waterways and will not divert water courses. All fluids will be stored in tanks.

An in-plant system for surface water drainage for the project site will be constructed and tied in to the main Estate drainage system.

Septic System
A septic system will be installed for sanitary sewage. CariSal will also explore a small activated sludge unit as an alternative.

14. Will the project require relocation of people ☐ houses ☐ facilities ☐ from the site?
    No. The project will not require relocation of people, houses, or facilities from the site. The site does not currently contain any structures.
    If yes, give details: *N/A*

15. What percentage of the intended project area would be cleared of vegetation?

    By the operational phase of the project, roughly 40-50 percent of the 11.8 hectares will be cleared (including expansion). After construction, large areas of the site will be replanted with a vegetative buffer. Cleared vegetation will be disposed of at an authorized waste facility such as the Forres Park Sanitary Landfill. Efforts will be made to avoid the unnecessary removal of any mature trees on the project site.

16. State mitigation measures for adverse impacts resulting during site preparation and the construction phase.

    See Attachment III – Environmental Impact Summary.

Operational Phase

17. State the required raw/input materials and the quantities/volumes (kg or metric tons/m^3) to be kept in stock for the project as well as their respective rates of consumption (kg or metric tons per day/m^3 per day).

Input/Chemical	*Consumption Rate*	*Quantity/Volume Kept in Stock*
Sodium chloride	***78,925 mtpa***	***Weak salt solution: 54 metric tons*** ***Brine recycled from electrolysis process: 92 metric tons***
Limestone	***58,305 mtpa***	***Limestone: 9,000 metric tons***
Lime (calcium oxide)	***5,228 mtpa***	***Lime: 40 metric tons***

(a) Would the activity require any ancillary process related chemicals (e.g. catalysts, pesticides)? ***Yes.***

If yes, state the quantity (kg or metric tonnes/ m^3) and rate of consumption.

Input/Chemical	*Consumption Rate (per annum)*	*Consumption Rate (per hour)*
Soda ash (Sodium carbonate)	***394.2 mtpa***	***45 kg/hr***
Calcium hydroxide	***456.25 mtpa***	***52 kg/hr***
Calcium chloride	***412.5 mtpa***	***47 kg/hr***
Cellulose filter aid	***65 mtpa***	***7.33 kg/hr***

See Attachment IV – Process Flow Diagram (PFD) for details.

(b) State the final products to be derived and the rate of production (metric tons/m^3 per year)

Product	*Rate of Production*
Calcium chloride – 94% product	***70,000 mtpa (100,000 mtpa after project expansion)***
Calcium chloride – 78% product	***18,450 mtpa***
Water	***74 m^3/hr (salable)*** ***162 m^3/hr (reused as process water)***
Caustic soda – 50% solution	***50,000 mpta (75,000 mtpa with expansion) . Quantity may change (a reduction) with the production of sodium hypochlorite.***
Sodium hypochlorite	***To be determined***

See Attachment IV – Process Flow Diagram (PFD) for details.

(c) State any intermediate products resulting from this activity indicating the rate of production (metric tons/m^3 per year) and their fate.

Input/Chemical	*Production Rate*	*Origin and Fate*
Hydrogen	***1,282 mtpa***	***Produced during electrolysis and reacted with chlorine to form hydrochloric acid***
Chlorine	***45,500 mtpa***	***Produced during electrolysis and reacted with hydrogen to form hydrochloric acid***
Hydrochloric acid	***45,846 mtpa***	***Produced from reaction with chlorine and hydrogen. Reacted with limestone to make calcium chloride***
Calcium chloride liquor – 42% solution	***69,700 mtpa Dry Basis***	***Intermediate product from the reaction of limestone with lime; used to make the final product***

See Attachment IV – Process Flow Diagram (PFD) for details.

(d) State the rate of production (metric tons per year) and method of disposal of domestic solid waste generated during the operational phase.

Domestic Solid Waste	*Quantity*
Typical business waste (paper, wood, etc.)	***~0.3-.5 mtpa – stored in proper waste containers and regularly removed to an authorized waste management facility.***
Domestic sewage	***~10-15 cubic meters per day treated on site via the plant's septic system designed to consistently meet relevant water quality standards.***

(e) List, characterise and quantify (metric tons per year) process related solid waste. State the method(s) and location intended for their disposal.

Solid Wastes	*Characterisation*	*Quantity*	*Fate*
Limestone impurity slag	***Magnesium carbonate and silica removed during the purification process***	***3,530 mtpa***	***Will be sold as a road stabilizer***
Calcium chloride fines	***Entrained in the scrubber/ offgas from final product driers***	***2,292 mtpa***	***Will be recycled in the process***

(f) Provide respective estimates for the rate of generation (m^3per day) of domestic wastewater and sewage. State the respective treatment methods intended for domestic wastewater and sewage as well as their ultimate effluent points.

Domestic Wastewater and Sewage	*Rate of Generation*	*Treatment and Effluent Points*
Sanitary sewer	***330 m^3/d***	***Sewage would be discharged to a septic system. Refer to Attachment II for the site layout, which shows the location of the septic sewer system.***

(g) State the source and process water consumption rate (m^3 per day)

Process water will be produced by the evaporation of waste brine from DESALCOTT. Start-up process (and construction) water will be purchased from WASA and consumed at a rate of 5,000 gallons per day/18.93m^3/day, for approximately 180 days.

(h) Would the activity discharge process related liquid effluent? Y ☒ N ☐
If yes, state the source, composition, discharge rate (m^3 per day) and the ultimate effluent points.

All process water from the plant will be treated and recycled with the exception of the cooling tower blow down (17,400 L/hr, composition to be determined during final design) and the ion exchange back-flush (see table below). Discharges from these processes will be transported to the Gulf of Paria via a (~2 Km long) pipeline in the NEC's utility corridor.

Ion Exchange Back Flush	
Flow, L/hr	1,138
	Kg/hr
NaCl	361
Water	1055
Calcium	0.013
Magnesium	0.03
Strontium	0.0002

(i) Would this activity utilise any hazardous (i.e. toxic, flammable, explosive, radioactive etc.) substances? Y ☒ N ☐

Chemical/Material	*Quantity Used/Produced*	*Quantity Stored*
Chlorine	*45,500 mtpa (produced and used)*	*None. Chlorine is generated as an intermediate in the process.*
Hydrogen	*1,282 mtpa (produced and used)*	*None. Hydrogen is generated as an intermediate in the process.*
Hydrochloric Acid	*45,850 mtpa (produced and used)*	*283,906 litres stored on site*
Caustic Soda	*50,000 mtpa (produced and used)*	*56,781 litres stored on-site* *11,356,235 litres stored at the port*

18. Would the project require storage of input and/or waste material on site? Y ☒ N ☐
If yes, give estimates of the quantities (kg or metric tons) for the storage of:

Material/Chemical	*Input/Waste/ Product*	*Location and Description of Facility*	*Capacity*
Caustic Soda	*Input, Product*	*Tank at Port*	*11, 356 m^3 (11,356,235 litres)*
Caustic Soda	*Input, Product*	*Tank at Plant Site*	*56.8 m^3 (56,781 litres)*
Process Water	*Input,*	*Tank at Plant Site*	*2,271 m^3 (2,271,247 litres)*

	Product		
Recycled Water	***Input***	***Tank at Plant Site***	***454 m^3 (454,249 litres)***
Weak Brine	***Input***	***Tank at Plant Site***	***946 m^3 (946,353 litres)***
Saturated Brine	***Input***	***Tank at Plant Site***	***454 m^3 (454,249 litres)***
HCL	***Input***	***Tank at Plant Site***	***284 m^3 (283,906 litres)***
42% CaCl	***Input***	***Tank at Plant Site***	***454 m^3 (454,249 litres)***
Limestone	***Input***	***Contained elevated outside area.***	***34.1 m^3 (34,061 litres)***
Lime Inerts	***Waste***	***Plant Site***	***Limestone inerts pile (will be sold as road fill).***
Slurry Waste	***Waste***	***Plant Site***	***Not stored. Sent to settling tank.***
Liquid waste	***Waste***	***Plant Site***	***There will be a small waste water sump for neutralization.***

(a) Describe briefly the facilities allocated for this purpose

See table above, column labeled "Location and Description of Facility."

19. Indicate the mode(s) of transport intended for materials and equipment necessary for the operational phase.

    1. ***Raw materials will be brought in by barge and trucked to the project site.***
    2. ***Caustic soda will be piped to the loading facilities at the Port.***
    3. ***Calcium chloride will be packaged in 50lb/22.7Kg bags and one kilo super sacks on the project site and then trucked to the Port for shipping.***

20. Will the activity generate air emissions (i.e. particulate emissions such as dust or pollutant gaseous emissions) during the operational phases? Y ☒ N ☐

    If yes, describe types and sources and provide an estimated emission rate or loading

Pollutant/gaseous emission	***Source***	***Emissions Rate***
Carbon dioxide	***During processing of calcium chloride liquid***	***7,082 m^3/hr****
Hydrochloric acid gas	***During processing of H_20 and NaOH to make HCl and from the HCl storage tank scrubber***	***~1.03 kg/hr***
Calcium fines entrained in the exhaust gas	***During calcium chloride packaging***	***~193 kg/hr***
Water vapor	***During processing of calcium chloride liquid***	***~14,737 m^3/hr***
Nitrous Oxides	***During processing of calcium chloride liquid***	***~3.04 kg/hr***

**** This amount may be substantially reduced if limestone feedstock is substituted by Lime feed. CariSal, the Applicant, is aggressively pursuing this option as part of its commitment to green process design.***

21. Will the activity routinely produce odors (i.e. for more than 1 hour per day)? Y ☐ N ☒

Chlorine is an odor producing chemical that will be used in the production process. Chlorine will be contained so that there would be only negligible or undetectable odor emissions. The production process is being designed as a closed loop system to ensure a very high degree of containment of all chemical inputs. See Attachment III – Environmental Impact Summary, Upset Conditions for a detailed discussion of how chlorine odors will be contained.

22. Will the activity generate significant levels of noise (i.e. for more than 1 hour per day at levels exceeding 60 dB) during its operational phase? Y ☐ N ☒

Under normal operating conditions, the noise level will be 85 db or less within the plant unless immediately adjacent to the HCL burner, 94 percent fans, evaporator circulating pump, etc. Employees working in this area will be required to wear hearing protection devises near this equipment.

On-site noise levels should drop to the point that an outdoor worker would not be able to hear what is going on inside a building. The perimeter noise is likely to be less than 60 dB.

Noise in excess of 85db may be produced for very short periods during plant startup, maintenance, performance testing, shut down or in emergency or upset conditions.

23. Will the project have adverse effects on the aesthetics of the area where it is located (i.e. result in radical changes of the landscape, such as scarring/mass vegetation removal)?

Y ☐ N ☒

The project area is already characterized by a high level of industrial uses and facilities.

24. State mitigation measures for adverse impacts resulting during the operational phase.

Please see the Environmental Summary, Attachment III.

25 State the expected lifespan of this activity

20+ years

C. CONFIDENTIALITY

26. (a) Do you consider any information provided here to be a trade secret or other confidential business information and that such information be omitted from the Register? Y ☐ N ☒

(b) Give details_____

27. Other relevant information

None.

28. Please list any attachments included in the application

Attachment I: Project Area Maps and Photos
Attachment II: Site Layout
Attachment III: Environmental Impact Summary
Attachment IV: Process Flow Diagram (PFD)
Attachment V: NEC Letter of Agreement for Lease of Property

APPENDIX G
ADDITIONAL DRAINAGE ANALYSIS

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Predevelopment

Peak Runoff

In response to the RAR, CariSal calculated the site runoff for both the predevelopment and post-development scenarios. Figure 1 presents the predevelopment site topography and shows the site divided into three drainage areas based on the indicated water divides. The figure indicates the area of each of the drainage areas and illustrates the approximate direction of surface water runoff. Area 1, in the northwest corner, drains toward the onsite perennial wetland, unless and until the ponded water level exceeds the elevation of the northern drainage channel (approximately 5.75m), at which point surface water can flow freely between the drainage channel and Area 1.

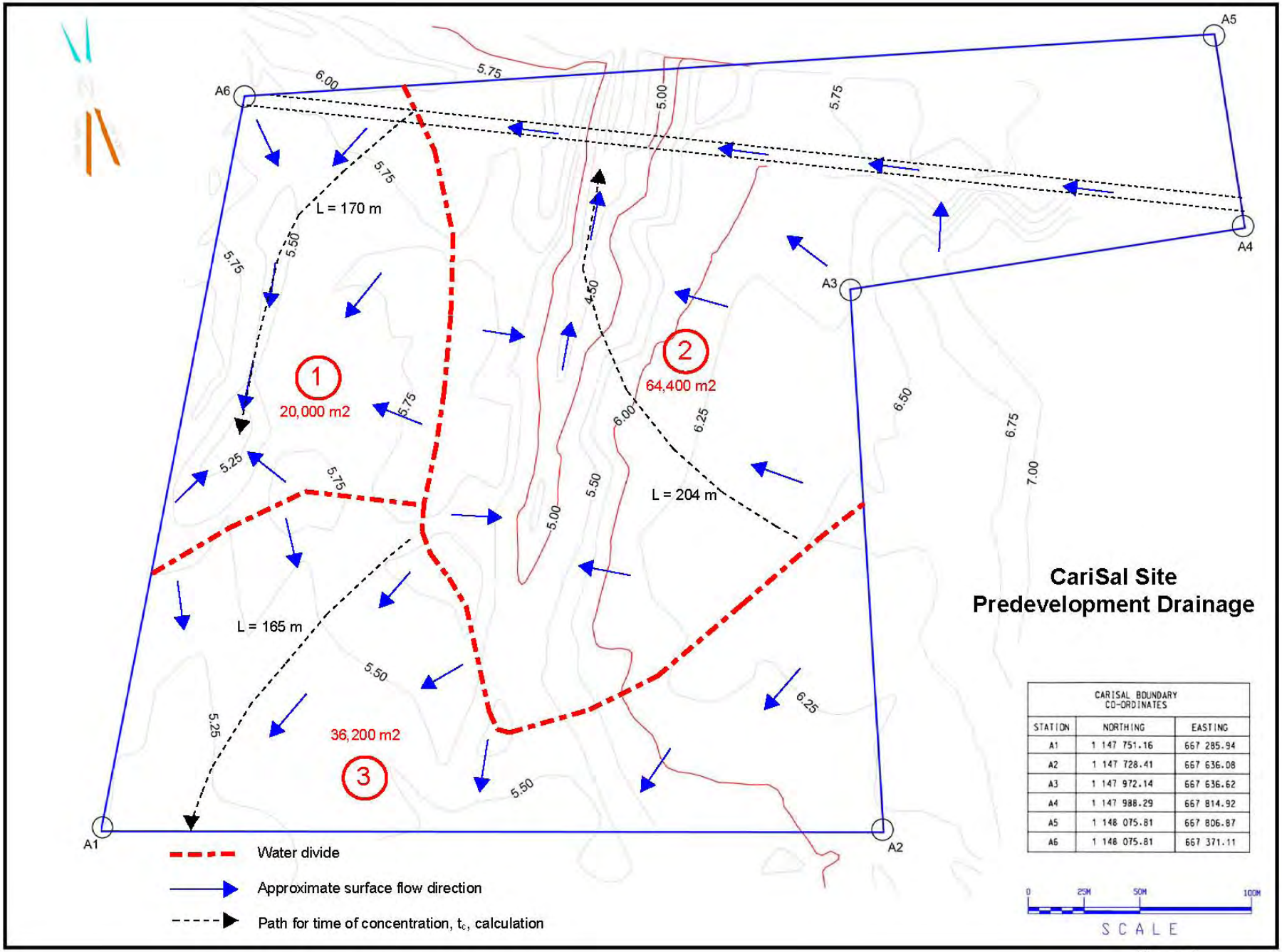
Area 2 comprises the majority of the eastern half of the site, including the area of the proposed administration building. This area drains towards the north-south depression in the center of the site and into the northern drainage channel.

Area 3 covers approximately the southern 30 percent of the site. This area drains to the south towards the LNG River through two culverts across North Sea Road.

Although the site does receive some run-on from adjacent properties, the amount is limited due to the drainage channel that cuts across the northern portion of the site, North Sea Road which passes along the southern boundary of the site, the relatively flat terrain east of the site, and the topography along the western boundary of Area 3. No detailed information on the topography immediately to the west of Area 1 is available, but since most of Area 1 would be preserved in its present state, the predevelopment and post-development run-on characteristics will be nearly the same and will have only a minor impact on the changes in the drainage caused by the proposed project.

The runoff analysis uses the Rational Method, with the time of concentration determined by the SCS[1] Lag Formula. The time of concentration indicates the minimum duration storm required to generate the peak flow, and is a function of the size of the drainage area, the slope of the terrain, and the hydrologic soil group.

[1] SCS, the Soil Conservation Service, is now the Natural Resource Conservation Service.



CARISAL BOUNDARY CO-ORDINATES		
STATION	NORTHING	EASTING
A1	1 147 751.16	667 285.94
A2	1 147 728.41	667 636.08
A3	1 147 972.14	667 636.62
A4	1 147 988.29	667 814.92
A5	1 148 075.81	667 806.87
A6	1 148 075.81	667 371.11

Figure 1

The geotechnical report[2] indicates that most of the site consists of sandy clay loam which corresponds to Natural Resource Conservation Service Hydrologic Soil Group C. Group C is described as soils with low infiltration rates (typically 0.05 to 0.15 in/hr) when thoroughly wetted.

The time of concentration is calculated as follows:

$$t_c = .00526 \frac{L^{0.8}}{S^{0.5}} \left(\frac{1000}{CN} - 9 \right)^{0.7} \tag{1}$$

where t_c = time of concentration in minutes
L = watershed length in feet
S = slope along drainage path, dimensionless
CN = SCS curve number, dimensionless (see Exhibit A)

The SCS curve number depends upon the land use, the type and amount of vegetative cover, and the hydrologic soil group. For the predevelopment scenario, the SCS curve number 80 was selected for all three drainage areas. Table 1 summarizes the time of concentration information for the predevelopment scenario.

Table 1. Time of Concentration, Predevelopment

	Area, m^2	Area, acres [*A*]	Length, m	Length, ft [*L*]	Slope [*S*]	SCS Curve Number [*CN*]	Time Conc., min
Area 1	20,000	4.94	170	558	0.0038	80	32
Area 2	64,400	15.91	204	669	0.0098	80	23
Area 3	36,200	8.95	165	541	0.0033	80	34
Totals	120,600	29.80					

Under the Rational Method, peak flow is determined by the following formula:

$$q = CiA \tag{2}$$

where q = peak flow in ft^3/sec
i = rainfall intensity in in/hr
A = watershed area in acres
C = runoff coefficient, ratio of the peak runoff rate to the rainfall intensity, dimensionless

The rainfall intensity, duration, and frequency curves for Longdenville (see Exhibit B) were used to determine the rainfall intensity for peak runoff. Table 2 lists the maximum rainfall for the 50-year return period.

[2] Earth Investigation Systems Limited, *CariSal Calcium Chloride Plant, Point Lisas, Geotechnical Investigation Report*, July 2007.

Table 2. Rainfall Intensity and Duration, 50-year Recurrence Interval

Duration	Rainfall, in.	Intensity, in./hr
5 minutes	0.60	7.20
10 minutes	0.87	5.22
15 minutes	1.40	5.60
30 minutes	1.87	3.74
1 hour	3.00	3.00
6 hours	4.58	0.76
24 hours	5.00	0.21

Based on the maximum time of concentration in Table 1, the rainfall intensity for the 50-year, 35-minute storm was interpolated as 3.6 in/hr and used for the peak flow analysis.

The runoff coefficient, *C*, depends on the soil type, land use characteristics, and topography of the land within the watershed. Exhibit C presents runoff coefficients for a variety of land uses and soil groups. For storms with a recurrence interval of 25 years or longer, the coefficient for all three drainage areas is taken as 0.26, based on the existing vegetation, slope, and soil type. Table 3 presents the input parameters and the results for the predevelopment runoff calculations.

Table 3. Peak Runoff, Predevelopment

	Area, m^2	Area, acres [*A*]	Rainfall Intensity, in/hr [*i*]	Runoff Coefficient [*C*]	Peak Runoff, ft^3/sec [q_p]	Peak Runoff, m^3/sec
Area 1	20,000	4.94	3.6	0.26	4.6	0.13
Area 2	64,400	15.91	3.6	0.26	14.9	0.42
Area 3	36,200	8.95	3.6	0.26	8.4	0.24
Totals	120,600	29.80			27.9	0.79

Total Runoff

As the duration of a storm increases and the ground saturates, the amount of runoff as a percentage of precipitation increases. We used the SCS Runoff Curve Method[3] to estimate the total runoff. Exhibit D presents tabulated data correlating the total runoff to the precipitation for a range of SCS curve numbers. Table 4 shows the estimated predevelopment runoff volumes for each of the three drainage areas for precipitation events up to the 100-year, 24-hour storm.

[3] USDA, *Urban Hydrology for Small Watersheds*, Technical Release 55, June 1986.

Table 4. Total Predevelopment Runoff for Different Magnitude Rainfall Events

	Area, m^3	Area 1	Area 2	Area 3
		20,000	64,400	36,200
	CN	80	80	80
Rainfall, in.	Runoff, in.	Runoff Volume, m^3	Runoff Volume, m^3	Runoff Volume, m^3
1.00	0.08	41	131	74
2.00	0.56	284	916	515
3.00	1.25	635	2045	1149
4.00	2.04	1036	3337	1876
5.00	2.89	1468	4727	2657
5.35	3.20	1626	5237	2944

Floodplain Capacity

The low lying areas of the site provide part of the floodplain capacity for the watershed. This is especially true of Areas 1 and 2 which drain towards the northern drainage channel. To determine the changes in flood plain capacity, for each of the three drainage areas we measured the areas circumscribed by various elevation contours and calculated the potential storage volumes up to those elevations. The results are tabulated in Table 5.

Post–Development

Peak Runoff

Figure 2 presents the post-development site topography and shows the site divided into three drainage areas based on the indicated water divides. The figure indicates the area of each of the drainage areas and illustrates the approximate direction of surface water runoff. In the post-development scenario, the southern half of the site is hydraulically isolated from the surrounding areas due to the construction of a perimeter protection system consisting of elevated roadways, perimeter berms, and retention ponds. Areas 1 and 2 would be smaller than in the predevelopment scenario.

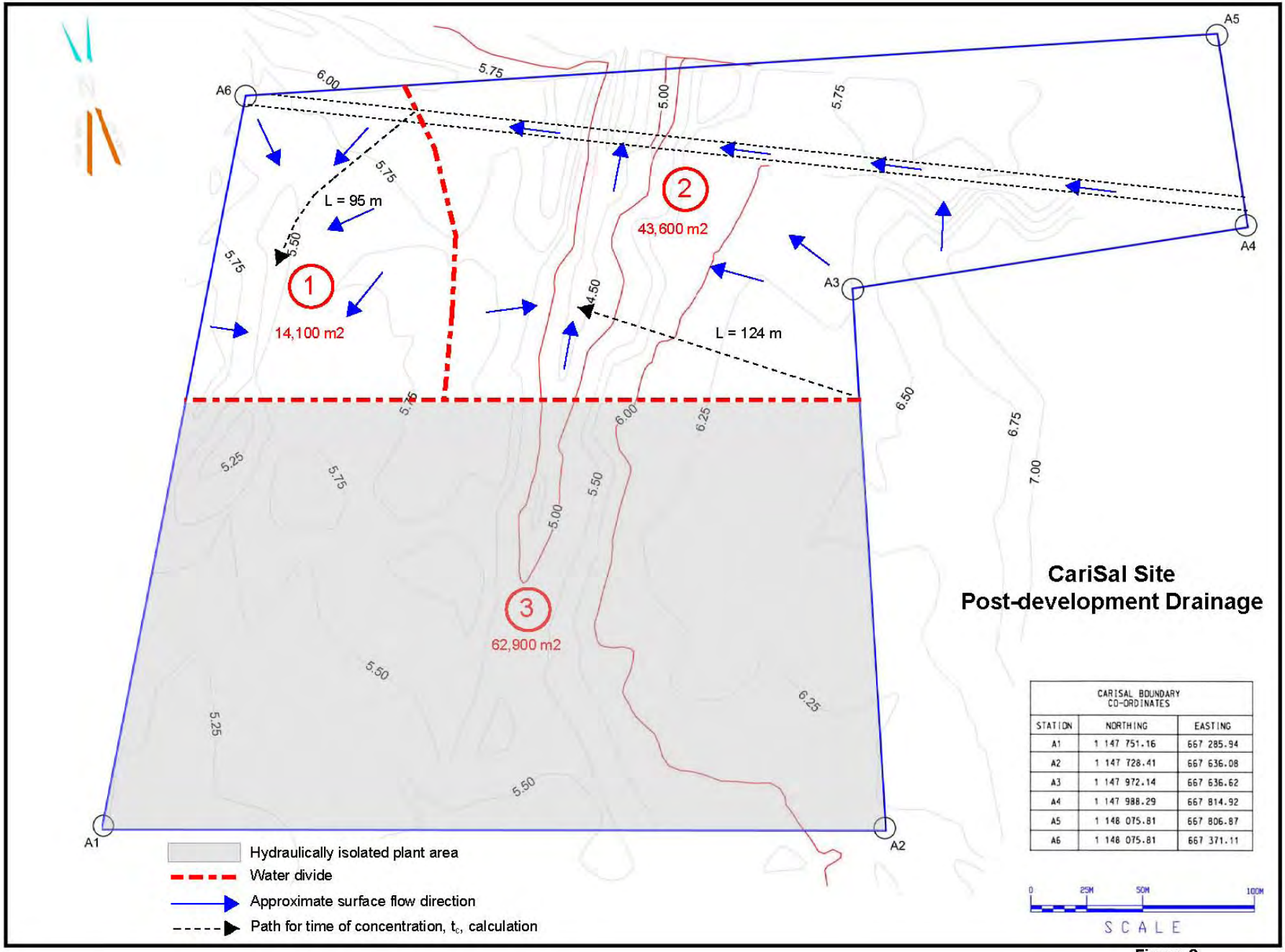
Table 5. Floodplain Storage Capacity at Various Water Levels, Predevelopment

Northerly Drainage			
Drainage Area	**Elevation, m**	**Area, m^2**	**Volume, m^3**
Area 1	5.15	0	0
	5.25	287	14
	5.50	2248	331
	5.75	13935	2354
Area 2	4.25	0	0
	4.50	1361	170
	5.00	4983	1756
	5.15	6505	2618
	5.25	7632	3325
	5.50	10844	5634
	5.75	17331	9156
Southerly Drainage			
Drainage Area	**Elevation, m**	**Area, m^2**	**Volume, m^3**
Area 3	5.15	0	0
	5.25	2,947	147

Area 1, in the northwest corner, would continue to drain toward the onsite perennial wetland, unless and until the ponded water level exceeds the elevation of the northern drainage channel (approximately 5.75 m), at which point surface water would be able to flow freely between the drainage channel and Area 1.

Area 2 would comprise the northeastern half of the site, including the area of the proposed administration building. This area would continue to drain towards the north-south depression in the center of the site and into the northern drainage channel.
Area 3 covers approximately the southern half of the site. All precipitation onto this area would be captured in the Retention Pond or the Containment Pit and subsequently used in the process.

For the post-development scenario, the SCS curve number 80 was retained for drainage Areas 1 and 2. The SCS curve number for Area 3 which would be largely paved or roofed was taken as 0.98 (see Exhibit A).Table 6 summarizes the time of concentration information for the post-development scenario.



CARISAL BOUNDARY CO-ORDINATES		
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A4	1 147 988.29	667 814.92
A5	1 148 075.81	667 806.87
A6	1 148 075.81	667 371.11

Figure 2

Table 6. Time of Concentration, Post-Development

Drainage Area	Area, m^2	Area, acres [*A*]	Length, m	Length, ft [*L*]	Slope [*S*]	SCS Curve Number [*CN*]	Time Conc., min [*t*]
Area 1	14,100	3.48	95	312	0.0042	80	19
Area 2	43,600	10.77	124	407	0.0161	80	12
Area 3	62,900	15.54	30	98	0.0078	98	3
Totals	120,600	29.80					

Based on the maximum time of concentration in Table 6, the rainfall intensity for the 50-year, 20-minute storm, interpolated as 5.0 in/hr, was used for the peak flow analysis in Areas 1 and 2. The maximum intensity for Area 3 is taken as 6.0 in/hr based on the preliminary drainage design performed by CariSal for the plant area.[4] As in the predevelopment analysis, the runoff coefficient for drainage Areas 1 and 2 was taken as 0.26 for storms with a recurrence interval of 25 years or longer. The coefficient for Area 3, which would be largely paved or roofed, was taken as 0.95 (see Exhibit C). Table 7 presents the input parameters and the results for the post-development runoff calculations.

Table 7. Peak Runoff, Post-development

Drainage Area	Area, m^2	Area, ft^2 [*A*]	Rainfall Intensity, in/hr [*i*]	Runoff Coefficient [*C*]	Peak Runoff, ft^3/sec [q_p]	Peak Runoff, m^3/sec
Area 1	14,100	3.48	5.0	0.26	4.5	0.13
Area 2	43,600	10.77	5.0	0.26	14.0	0.40
Area 3	62,900	15.54	6.0	0.95	0.0[a]	0.00
Totals	120,600	29.80			18.5	0.53

[a] The calculated peak runoff for the plant drainage systems equals 88.6 ft^3/sec (2.51 m^3/sec) for Area 3, but because it would be contained onsite the offsite runoff equals 0.0 ft^3/sec.

Total Runoff

Table 8 shows the estimated post-development runoff for each of the three drainage areas for precipitation events up to the 100-year, 24-hour storm.

[4] Paudel, S., "Drainage Plan for CariSal", 8 November 2007.

Table 8. Total Post-Development Runoff for Different Magnitude Rainfall Events

		Area 1	Area 2		Area 3
	Area, m^3	14,100	43,600		62,900
	CN	80	80		98
Rainfall, in.	Runoff, in. CN = 80	Runoff Volume, m^3	Runoff Volume, m^3	Runoff, in. CN = 98	Runoff Volume[a], m^3
1.00	0.08	29	89	0.79	1262
2.00	0.56	201	620	1.77	2828
3.00	1.25	448	1384	2.77	4426
4.00	2.04	731	2259	3.77	6023
5.00	2.89	1035	3201	4.76	7605
5.35	3.20	1147	3545	5.11	8164

[a] Amounts shown for illustrative purposes only. There would be no post-development runoff from Area 3, the developed southern portion of the CariSal.

Floodplain Capacity

The low lying areas of drainage Areas 1 and 2 would continue to provide part of the floodplain capacity for the watershed under the post-development scenario. As before, for each of the three drainage areas we measured the areas circumscribed by various elevation contours and calculated the potential storage volumes up to those elevations. The results for the post-development scenario are tabulated in Table 9.

Table 9. Floodplain Storage Capacity at Various Water Levels, Post-development

Northerly Drainage			
Drainage Area	Elevation, m	Area, m^2	Volume, m^3
Area 1	5.40	0	0
	5.50	814	41
	5.75	9020	1270
Area 2	4.25	0	0
	4.50	1361	170
	5.00	3971	1503
	5.40	5830	3463
	5.50	6351	4072
	5.75	10151	6135

In the post-development scenario, Area 3 would be hydraulically isolated from the surrounding areas, and would no longer drain offsite toward the LNG River. The storage capacity of the two

retention ponds would be approximately 13,700 m^3. The total rainfall falling within Area 3 from the 100-year, 24-hour storm (5.35 inches) would equal only 8,548 m^3.

Comparison of the Predevelopment and the Post-development Scenarios

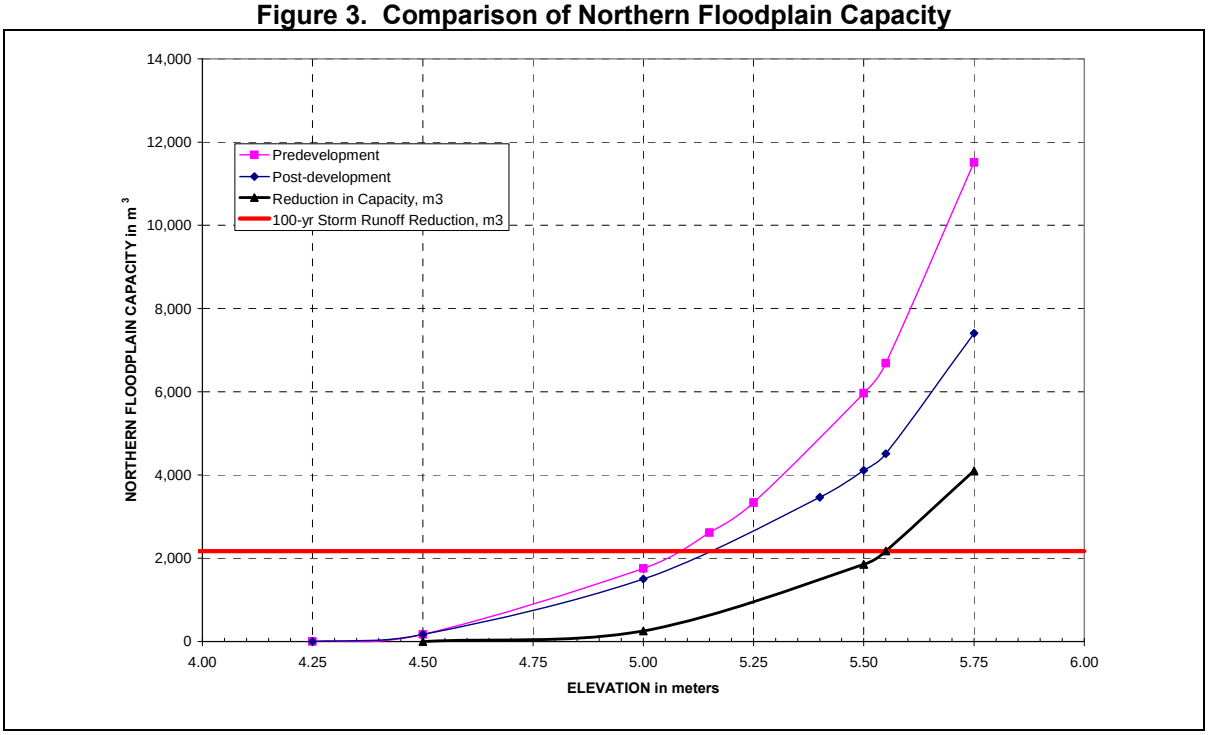
Northerly Drainage

Development on the CariSal site would result in the reduction of drainage Areas 1 and 2 by about one third. The reduced areas would have smaller times of concentration which would result in greater rainfall intensities contributing to the peak flows. These smaller areas and higher intensities would offset each other almost exactly so the peak flows in the northerly direction would remain essentially unchanged from 0.55 m^3/sec predevelopment to 0.52 m^3/sec post-development.

The reduction in the areas would have a proportional effect on the total amount of runoff, so the post-development scenario would produce approximately 32% less runoff towards the northern drainage channel for any amount of precipitation. For the 100-year, 24-hour storm, the combined runoff from Areas 1 and 2 would decrease from the predevelopment volume of 6,863 m^3 to the post-development volume of 4,692 m^3.

The reduction in the size of drainage Areas 1 and 2 reduces the floodplain capacity, as tabulated in Tables 5 and 9 and shown in Figure 3. The reduction in floodplain capacity is offset by the reduction in runoff due to the reduced sizes of the drainage areas. For the 100-yr, 24-hr storm, the reduction in runoff equals the reduction in floodplain capacity up to elevation 5.55 m. For all flooding events with an onsite water level greater than elevation 5.55 m, the proposed development would cause a greater reduction in the runoff volume than in the floodplain capacity, thus providing a net increase in the northern floodplain capacity whether the net flow is onto the CariSal site or from the CariSal site. This net increase in floodplain capacity will have a marginally beneficial reduction on downstream flooding. Flooding within the post-development 5.55 m elevation contour would have no negative impacts on the proposed CariSal facilities.

Figure 3. Comparison of Northern Floodplain Capacity



Any flooding within the post-development 5.55 m elevation contour would have no negative impacts on the proposed CariSal facilities. Due to the net increase in floodplain capacity above this level, any flooding within the northern portion of the CariSal site above this elevation would be at a lower level post-development than it would have been predevelopment.

Due to the offset between the runoff reduction and the floodplain capacity, the conditions in the post-development preserved wetlands would be comparable to the predevelopment conditions. The water levels in the wetlands are driven not just by surface water flows, but also by the groundwater level and subsurface flows. The water level in the northern drainage channel has an important impact on the groundwater level in the vicinity of the CariSal site. Recent work on the NGC pipeline right-of-way has interrupted the northern drainage channel and may reduce future flows in the channel during storm events.

Southerly Drainage

Development of the CariSal site would cause beneficial changes to the drainage patterns on the southern portion of the site. Since post-development, Area 3 would be hydraulically isolated from the surrounding land, the peak runoff would decrease from 0.24 m^3/sec to 0.0 m^3/sec. The total offsite runoff would decrease from the predevelopment values shown in Table 5 to zero. For the 100-yr, 24-hour storm, this equates to a decrease of 2,944 m^3 which contributes to a reduction in the flooding potential of the LNG River. The southern portion of the site does not currently contribute any significant floodplain capacity (see Table 5).

The storage capacity of the two retention ponds would be approximately 13,700 m^3. The total rainfall falling within Area 3 from the 100-year, 24-hour storm (5.35 inches) would equal only

8,548 m^3, of which 8,164 m^3 would manifest itself as runoff contained on site. The engineered drainage system within the plant area would be designed to convey runoff to the retention ponds without ponding within the plant area.

Exhibit A. Runoff Curve Numbers[5]

Runoff curve numbers for cultivated agricultural lands

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2]	Hydrologic condition [3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

indicates the selected predevelopment runoff curve number

[5] USDA, *Urban Hydrology for Small Watersheds*, Technical Release 55, June 1986.

SCS Runoff curve numbers for urban areas

Cover type and hydrologic condition	Average percent impervious area [2]	Curve numbers for hydrologic soil group A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

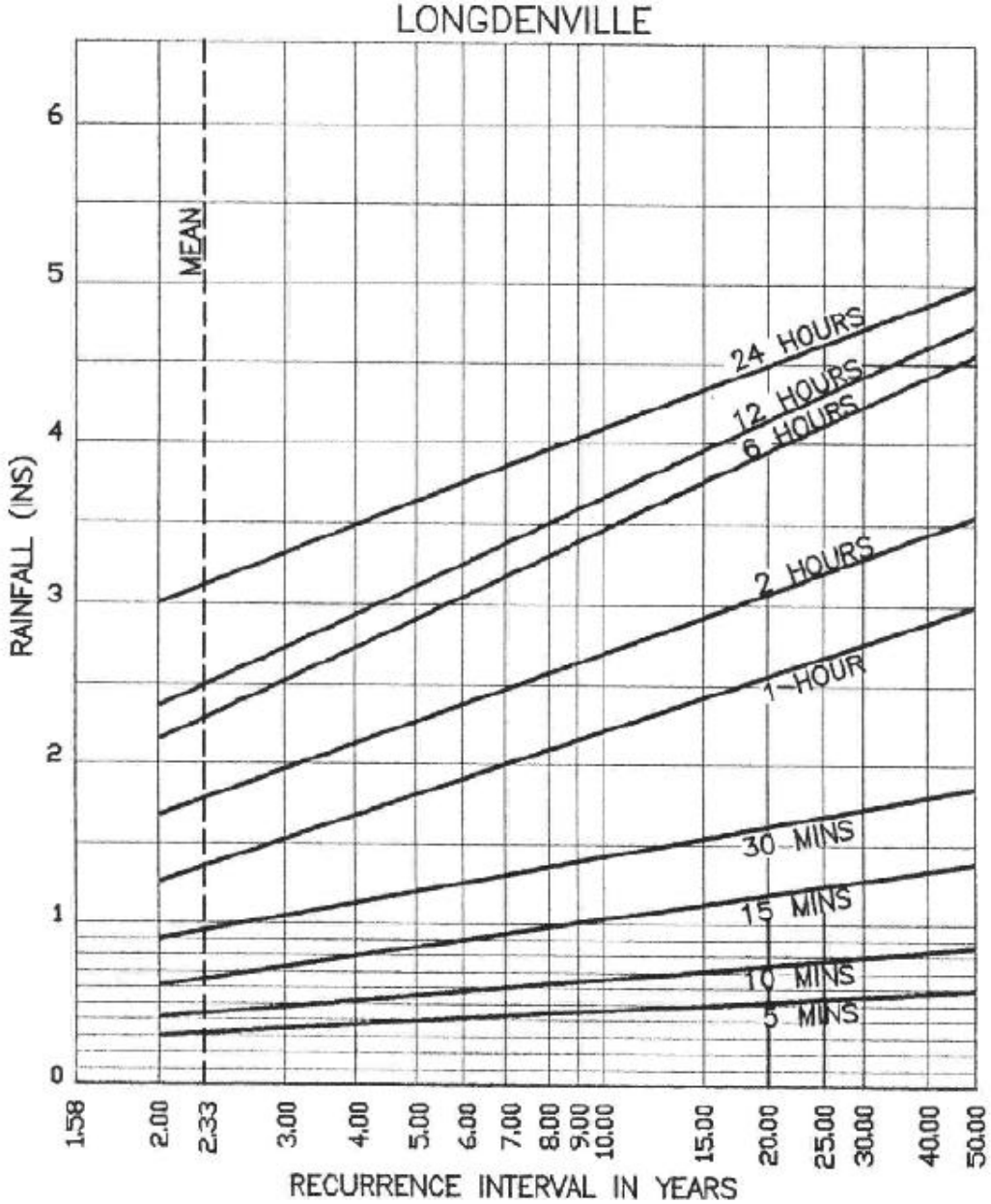
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

indicates the selected post-development runoff curve number

Exhibit B. Rainfall Intensity-Duration-Frequency Curves[6]



[6] Sage Environmental Consulting, "EIA for the Proposed Ethylene and Polyethylene Complex, Point Lisas", 2007 (original source: Trinidad and Tobago Water Resource Agency)

Exhibit C. Runoff Coefficients for the Rational Formula for Hydrological Soil Groups (A, B, C, D) and Slope Ranges[7]

	A			B			C			D		
Land Use	0–2%	2–6%	6%+	0–2%	2–6%	6%+	0–2%	2–6%	6%+	0–2%	2–6%	6%+
Cultivated land	0.08[a]	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
	0.14[b]	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Meadow	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Residential lot	0.25	0.28	0.31	0.27	0.30	0.35	0.30	0.33	0.38	0.33	0.36	0.42
size 1/8 acre	0.33	0.37	0.40	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
Residential lot	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.30	0.34	0.40
size 1/4 acre	0.30	0.34	0.37	0.33	0.37	0.42	0.36	0.40	0.47	0.38	0.42	0.52
Residential lot	0.19	0.23	0.26	0.22	0.26	0.30	0.25	0.29	0.34	0.28	0.32	0.39
size 1/3 acre	0.28	0.32	0.35	0.30	0.35	0.39	0.33	0.38	0.45	0.36	0.40	0.50
Residential lot	0.16	0.20	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.30	0.37
size 1/2 acre	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34	0.38	0.48
Residential lot	0.14	0.19	0.22	0.17	0.21	0.26	0.20	0.25	0.31	0.24	0.29	0.35
size 1 acre	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.40	0.31	0.35	0.46
Industrial	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.69	0.69	0.69	0.69	0.70
	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial	0.71	0.71	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.90	0.89	0.89	0.90
Streets	0.70	0.71	0.72	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
	0.76	0.77	0.79	0.80	0.82	0.84	0.84	0.85	0.89	0.89	0.91	0.95
Open space	0.05	0.10	0.14	0.08	0.13	0.19	0.12	0.17	0.24	0.15	0.21	0.28
	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Parking	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

[a] Runoff coefficients for storm recurrence intervals less than 25 years.

[b] Runoff coefficients for storm recurrence intervals of 25 years or longer.

indicates the selected predevelopment runoff coefficient

indicates the selected post-development runoff coefficient

[7] McCuen, R. H. 2004. *Hydrologic Analysis and Design*. Prentice Hall.

Exhibit D. Equivalent runoff depth for selected curve numbers and rainfall amounts[8]

Rainfall	Runoff depth for curve number of—												
	40	45	50	55	60	65	70	75	80	85	90	95	98
	inches												
1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.17	0.32	0.56	0.79
1.2	.00	.00	.00	.00	.00	.00	.03	.07	.15	.27	.46	.74	.99
1.4	.00	.00	.00	.00	.00	.02	.06	.13	.24	.39	.61	.92	1.18
1.6	.00	.00	.00	.00	.01	.05	.11	.20	.34	.52	.76	1.11	1.38
1.8	.00	.00	.00	.00	.03	.09	.17	.29	.44	.65	.93	1.29	1.58
2.0	.00	.00	.00	.02	.06	.14	.24	.38	.56	.80	1.09	1.48	1.77
2.5	.00	.00	.02	.08	.17	.30	.46	.65	.89	1.18	1.53	1.96	2.27
3.0	.00	.02	.09	.19	.33	.51	.71	.96	1.25	1.59	1.98	2.45	2.77
3.5	.02	.08	.20	.35	.53	.75	1.01	1.30	1.64	2.02	2.45	2.94	3.27
4.0	.06	.18	.33	.53	.76	1.03	1.33	1.67	2.04	2.46	2.92	3.43	3.77
4.5	.14	.30	.50	.74	1.02	1.33	1.67	2.05	2.46	2.91	3.40	3.92	4.26
5.0	.24	.44	.69	.98	1.30	1.65	2.04	2.45	2.89	3.37	3.88	4.42	4.76
6.0	.50	.80	1.14	1.52	1.92	2.35	2.81	3.28	3.78	4.30	4.85	5.41	5.76
7.0	.84	1.24	1.68	2.12	2.60	3.10	3.62	4.15	4.69	5.25	5.82	6.41	6.76
8.0	1.25	1.74	2.25	2.78	3.33	3.89	4.46	5.04	5.63	6.21	6.81	7.40	7.76
9.0	1.71	2.29	2.88	3.49	4.10	4.72	5.33	5.95	6.57	7.18	7.79	8.40	8.76
10.0	2.23	2.89	3.56	4.23	4.90	5.56	6.22	6.88	7.52	8.16	8.78	9.40	9.76
11.0	2.78	3.52	4.26	5.00	5.72	6.43	7.13	7.81	8.48	9.13	9.77	10.39	10.76
12.0	3.38	4.19	5.00	5.79	6.56	7.32	8.05	8.76	9.45	10.11	10.76	11.39	11.76
13.0	4.00	4.89	5.76	6.61	7.42	8.21	8.98	9.71	10.42	11.10	11.76	12.39	12.76
14.0	4.65	5.62	6.55	7.44	8.30	9.12	9.91	10.67	11.39	12.08	12.75	13.39	13.76
15.0	5.33	6.36	7.35	8.29	9.19	10.04	10.85	11.63	12.37	13.07	13.74	14.39	14.76

[8] USDA. 1986. *Urban Hydrology for Small Watersheds*, Technical Release 55, June.