

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION DIVISION OF AIR QUALITY AIR PERMITS PROGRAM

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May 29, 2007

Kristy McCullough
Environmental Advisor
Agrium U.S. Inc.
P.O. Box 575
Kenai, AK 99611-0575

Subject: Final Decision for Agrium U.S. Inc. (Agrium) Kenai Nitrogen Operations (KNO) Title I Permit Revisions - Air Quality Control (AQC) Minor Permit No. AQ0083MSS02

Dear Ms. McCullough:

Under the authority of AS 46.14.170, the Alaska Department of Environmental Conservation (the Department) is issuing the enclosed final AQC minor permit and technical analysis report (TAR) for the KNO. The permit contains the applicable provisions of AS 46.14 and 18 AAC 50. The terms and conditions of this permit remain effective until modified or revoked by the Department, regardless of any change in ownership of the stationary source or its emission units. The responsibilities imposed by this permit may not be transferred without the written consent of the Department.

On April 11, 2007, the Department provided opportunity for public comment on the preliminary decision by posting a public notice on our website and in a newspaper. The Department received comments only from Agrium. The Department has revised the permit and TAR as described in the attached Response to Comments document.

The Department considers the changes authorized in this permit to be Clean Air Act Section 502(b)(10) for the purpose of Title V permitting, except for the changes to Conditions 39, 40, 41, and the lead in to condition 42 Operating/Construction Permit No. AQ0083TVP01 Revision 1. The Permittee may operate in accordance with the Section 502(b)(10) changes upon issuance. The Permittee must still comply with the provisions of Conditions 39, 40, 41, and the lead in to condition 42 listed in Permit No. AQ0083TVP01 Revision 1 until the Department issues a revised Title V permit.

+38, per conversation w/
Sally Ryan, because
these conditions are not
related to Cogen construction,
so need to be in Title V
before applicable.

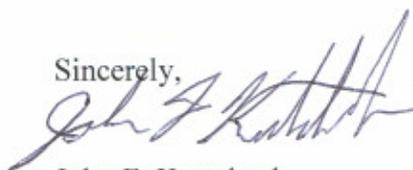
Please note that Alaska's air quality statutes, regulations and permit application information can be obtained from the department's web page at the following address:

<http://www.dec.state.ak.us/air/ap/calendar.htm>

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195-18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 555 Cordova, Anchorage, Alaska 99501, within 15 days of the permit decision.

Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, PO Box 111800, Juneau, Alaska 99811-1800, within 30 days of the permit decision. If a hearing is not requested within 30 days, the right to appeal is waived.

Sincerely,



John F. Kuterbach,
Air Permits Program Manager

Enclosure: Permit No. AQ0083MSS01, TAR, and Response to Comments

cc: Laurie Kral, EPA Region 10, Seattle
Patrick Dunn, ADEC/APP, Juneau
P. Moses Coss, ADEC/APP, Fairbanks
Cynthia Espinoza, ADEC/APP, Anchorage
Tim Knapp, ADEC/APP, Anchorage
Sally Ryan, ADEC/APP, Anchorage
Jeanette Brena, Entrix, Inc., Anchorage

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DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONTROL MINOR PERMIT

Permit No.: AQ0083MSS02

Date: **Final – May 29, 2007**

Rescinds Permit No. 9923- -AC004, Revision 1

Rescinds and Replaces conditions 7 (lead-in only), 7.1 through 7.3, 7.5, 8 (lead-in only), 12 (lead-in only), 12.1, 13 (lead-in only), 13.1, 13.2, 14, 15 (lead-in only), 15.1, 15.2, 38 (lead-in only), 38.1, 38.2, 38.3, 41, 42 (lead-in only), 42.1 through 42.13, 43, 43.1 and 43.2 of Operating/Construction (O/C) Permit No. AQ0083TVP01, Revision 1

Rescinds the lead in to condition 11, 39, and 40 of O/C Permit No. AQ0083TVP01, Revision 1

The Alaska Department of Environmental Conservation (Department), under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit No. AQ0083MSS02 to the Permittee listed below.

Permittee: **Agrium U.S. Inc.**
PO Box 575
Kenai, AK 99611-0575

Owner/Operator: Same as Permittee

Stationary Source: **Kenai Nitrogen Operations Plant**

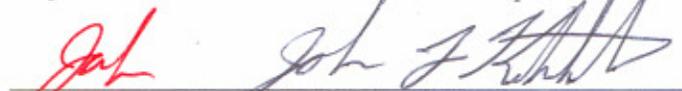
Location: Latitude: 60°40'28", Longitude: 151°22'45"

Physical Address: Mile 21 Kenai Spur Highway

Permit Contact: Kristy McCullough (907) 776-3155
kmccullo@agrium.com

Project: Revisions to Title I Permit Provisions

This project requires a minor permit 18 AAC 50.508(6) to revise or rescind terms and conditions of a previous Title I permit. The permit satisfies the obligation of the Permittee to obtain a minor permit under 18 AAC 50. This permit authorizes the Permittee to operate under the terms and conditions of this permit, and as described in the original permit application and subsequent application supplements listed in Section 4, except as otherwise specified in this permit. The Permittee may operate under this minor permit upon issuance, except that the Permittee must comply with the provisions of Conditions 39, 40, 41, and 42 (lead-in) listed in Permit No. AQ0083TVP01 Revision 1 until the Department issues a revised Title V operating permit.



John F. Kuterbach
Manager, Air Permits Program

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Section 1 *Permit Administration*

1. Permit No. AQ0083MSS02 rescinds Permit No. 9923-AC004, Revision 1.
2. Permit No. AQ0083MSS02 rescinds and replaces conditions 7 (lead-in only), 7.1 through 7.3, 7.5, 8 (lead-in only), 12 (lead-in only), 12.1, 13 (lead-in only), 13.1, 13.2, 14, 15 (lead-in only), 15.1, 15.2, 38 (lead-in only), 38.1, 38.2, 38.3, 41, 42 (lead-in only), 42.1 through 42.13, 43, 43.1 and 43.2 of Operating/Construction (O/C) Permit No. AQ0083TVP01, Revision 1.
3. Permit No. AQ0083MSS02 rescinds condition 11, 39, and 40 of O/C Permit No. AQ0083TVP01, Revision 1

Section 2 Reinstatement and Revision of Title I Provisions

Note: “Unit IDs” listed in this permit refer to “Source IDs” described in Table 1 of Operating/Construction (O/C) Permit No. AQ0083TVP01, Revision 1.

Nitrogen Oxide (NO_x) Prevention of Significant Deterioration (PSD) Avoidance, Unit IDs 9 through 11, 22, and 23

4. The Permittee shall limit total emissions of NO_x from the Ammonia (NH₃) Flare System (Unit IDs 9 through 11, 22, and 23) to less than 102 tons per year.

[Permit-to-Operate No. 9423-AA011, Amendment 1, condition 7a, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 7 lead-in]

- 4.1 The Permittee shall analyze process gas for NH₃ and methane from continuous sources sent to the Ammonia Flare System monthly. Flow will be measured at the same frequency using either pitot tubes or tracer gas injection. Estimate methane and NH₃ emissions during non-routine flaring events using engineered design composition and/or open source valve duration.

[Permit-to-Operate No. 9423-AA011, condition 21, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 7.1]

- 4.2 Calculate the monthly and the twelve-month consecutive summation of NH₃ and methane burned in the Ammonia Flare System. Use the gas composition and flow data determined in condition 4.1 to calculate the monthly burn rates.

[Permit-to-Operate No. 9423-AA011, Exhibit D, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 7.2]

- 4.3 Use the factors described in Section 16 (of O/C Permit No. AQ0083TVP01, Rev 1) to calculate and record monthly NO_x emissions. Use a 99 percent NH₃ to nitrogen conversion efficiency (the estimated molar volume of NO_x, including thermal NO_x, is one percent of the molar volume of NH₃ flared) in the Ammonia Flare System.

[Permit-to-Operate No. 9423-AA011, condition 8, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 7.3]

- 4.4 Report the monthly and the consecutive twelve-month period summation of tons of NH₃ and methane burned, and NO_x emitted, for each month of the reporting period, with each operating report described in condition 75 (of O/C Permit No. AQ0083TVP01, Rev 1).

[Permit-to-Operate No. 9423-AA011, condition 21, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 7.5]

5. The Permittee shall ensure that the Purge and Vent Recovery System in Ammonia Plant 4 is operated for more than 90 percent of the total hourly operational time for Ammonia Plant 4.

[Permit-to-Operate No. 9423-AA011, condition 6, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 8 (lead in)]

Sulfur Dioxide (SO₂) PSD Modification Avoidance and Ambient Air Quality Protection Requirements

6. The Permittee shall use natural gas, in Unit IDs 62 and 64, with a hydrogen sulfide (H₂S) concentration of no more than 40 parts per million by volume (ppmv).¹

[Construction Permit No. 9923-AC004, Revision 1, Condition 25, 7/14/06, as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 12 lead in (no change)]

6.1 Monitoring – The Permittee shall **either**

[Construction Permit No. 9923-AC004, Revision 1, Condition 28.2 and 33.4, 7/14/06 as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 12.1 (no change), and amended in Permit No. AQ0083MSS02]

- a. obtain a semiannual statement from the fuel supplier of the fuel gas H₂S concentration in ppm; **or**
- b. analyze a representative sample of the fuel semiannually to determine the sulfur content using the length of stain detector tube protocol covered by ASTM Method D 4810-88, or Method D-5504-01.

6.2 Recordkeeping - Keep records of the semiannual statement from the fuel supplier or the sulfur content analysis required under conditions 6.1a or 6.1b.

[Construction Permit No. 9923-AC004, Revision 1, Condition 28.2 and 33.4, 7/14/06 as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 12.1 (no change), and amended in Permit No. AQ0083MSS02]

6.3 Reporting –

[Construction Permit No. 9923-AC004, Revision 1, Condition 28.2 and 33.4, 7/14/06 as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 12.1 (no change), and amended in Permit No. AQ0083MSS02]

- a. Notify the Department under condition 73 (of O/C Permit No. AQ0083TVP01, Rev 1) if the H₂S concentration exceeds the limit in this condition.
- b. Except as indicated in condition 6.3c, include copies of the records required by this condition with the stationary source operating report required by condition 75 (of O/C Permit No. AQ0083TVP01, Rev 1).
- c. Until the first time the fuel gas H₂S content monitored semiannually under condition 6.1 exceeds 32 ppmv, the Permittee may submit an annual compliance certification under condition 76 (of O/C Permit No. AQ0083TV01, Rev 1) in lieu of the reporting requirements in condition 6.3b), stating whether the fuel gas H₂S is below 40 ppmv.

7. The Permittee shall burn no more than 2,000 gallons of fuel per 12-month period in Unit ID 63.

[Construction Permit No. 9923-AC004, Revision 1, Condition 26, 7/14/06, as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 13 lead-in (no change)]

7.1 Measure and record the total fuel oil (gallons) consumed each month in Unit ID 63.

¹ Permit No. 9923-AC004 condition 35 indicates that the H₂S limit is 40 ppmv (no 40 ppmw).

[Construction Permit No. 9923-AC004, Revision 1, Condition 28.5, 7/14/06 as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 13.1 (no change)]

- 7.2 Report using the operating report under condition 75 described in O/C Permit No. AQ0083TVP01, Rev 1 the monthly fuel oil consumption and 12-month rolling average fuel consumption.

[Construction Permit No. 9923-AC004, Revision 1, Condition 29.2.2, 7/14/06, as carried over into O/C Permit No. AQ0083TVP01 Revision 1, condition 13.2 (no change)]

8. The Permittee shall use only No. 1 or No. 2 diesel fuel oil in Unit ID 63.

[Construction Permit No. 9923-AC004, Revision 1, Condition 26, 7/14/06, as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 14 and amended in Permit No. AQ0083MSS02]

- 8.1 Keep receipts that specify fuel grade for all liquid fuel received at the stationary source during the reporting period.

[Construction Permit No. 9923-AC004, Revision 1, Condition 28.3.1, 7/14/06 (missing from O/C Permit No. AQ0083TVP01, Revision 1)]

- 8.2 Submit an annual compliance certification under condition 76 (of O/C Permit No. AQ0083TV01, Rev 1), stating whether the Permittee used only No. 1 or No. 2 diesel fuel oil in Unit ID 63.

9. The Permittee shall burn no greater than 3,250 mmscf of natural gas per 12-month period in Units IDs 42 through 44, 48, and 49, combined.

[Construction Permit No. 9923-AC004, Revision 1, Condition 27, 7/14/06, as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 15 lead-in (no change)]

- 9.1 Monitor and record the monthly and rolling 12-month summation of fuel consumption for Unit IDs 42 through 44, 48, and 49 combined.

[Construction Permit No. 9923-AC004, Revision 1, Condition 28.4, 7/14/06, as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 15.1 (no change)]

- 9.2 Report using the operating report described in condition 75 of O/C Permit No. AQ0083TVP01, Rev 1 the rolling 12-month summation of fuel consumption for Unit IDs 42 through 44, 48, and 49 combined for each month of the reporting period.

[Construction Permit No. 9923-AC004, Revision 1, Condition 29.2 and 29.2.1, 7/14/06 as carried over into O/C Permit No. AQ0083TVP01, Revision 1, condition 15.2 (updated test methods)]

Visible Emission and PM Monitoring for Urea Prill Tower - Unit ID 27

10. Monitor visible emissions using the four transmissometers installed on the Urea Prilling Tower. Calibrations shall be performed in accordance with the Agrium Transmissometer Quality Assurance Plan (March 2001), or a Department approved updated version. Compliance for any time interval shall be based on the average of the data recorded by all transmissometers displaying normal operational status. Except for system breakdowns, repairs, preventive maintenance, calibration checks and zero and span adjustments, the four transmissometers shall operate at all times that Unit ID 27 is in operation.

[Permit to Operate Permit No. 9423-AA011, Condition 20 and Exhibit C, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 33.1]

NH₃ Ambient Air Quality Protection Requirements

11. The Permittee shall perform continuous ambient air quality monitoring for NH₃ to demonstrate compliance with the ambient air quality standard set out in 18 AAC 50.010(8) following Method 4.10 and provisions set forth in the Alaska Quality Assurance Manual for Ambient Air Quality Monitoring, dated August 1996 and as amended below. Monitoring shall be conducted at the monitoring station site located northeast of the KNO Plant, at Mile 21.5 Spur Highway. Exemptions from the Alaska Quality Assurance Manual may be granted in writing by the Department's Air Monitoring Group. In the event that the Air Monitoring Group approves the Agrium KNO Quality Assurance Plan, this document will supersede the Alaska Quality Assurance Manual. The Permittee shall provide access to the monitoring sites promptly, at any reasonable time, to the Department's representative, and any other person authorized or contracted by the Department, in order to conduct routine audits and other quality assurance activities to determine compliance with this permit, State regulations, and State environmental laws.

[Permit-to-Operate Permit No. 9423-AA011, Condition 15, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 38 lead-in]

- 11.1 The Permittee shall report NH₃ monitoring results based on 100 percent NO₂ converter efficiency, in lieu of performing NO₂ converter efficiency validations set out in the Alaska Quality Assurance Manual for Ambient Air Quality Monitoring, Method 4.10, dated August 1996.

[Permit-to-Operate Permit No. 9423-AA011, Condition 16, as amended through TVP, condition 38.1]

- 11.2 The Permittee shall provide quarterly independent (i.e. independent of the individual performing the routine maintenance) performance audits of each monitor in the NH₃ monitoring network.

[Permit-to-Operate Permit No. 9423-AA011, Condition 17, as amended through TVP, condition 38.2]

- 11.3 The Permittee shall contract for oversight systems and performance audits of the monitoring network operations once per year by a firm completely independent from the firm responsible for conducting monitoring operations.

[Permit-to-Operate Permit No. 9423-AA011, Condition 18, as amended through TVP, condition 38.3]

- 11.4 The Permittee shall provide complete documentation of all systems and performance audits to the Department within 60 days of completion of the audit, unless the Permittee elects to report using the Quarterly Data Summary and Annual Data Report format available on the Department's website at http://www.dec.state.ak.us/air/am/PSD_Met_qrtly.pdf and http://www.dec.state.ak.us/air/am/PSD_Met_annual_1-1.pdf respectively.

[Permit-to-Operate Permit No. 9423-AA011, Exhibit F.III, as amended through TVP, condition 41]

- 11.5 The Permittee shall provide the following quality assurance documentation with the operating report required under condition 75, unless the Permittee elects to report using the Quarterly Data Summary and Annual Data Report format available on the Department's website at http://www.dec.state.ak.us/air/am/PSD_Met_qrtly.pdf and http://www.dec.state.ak.us/air/am/PSD_Met_annual_1-1.pdf respectively:

- a. All valid or flagged one-hour and eight-hour averages for all channels used to calculate ammonia analyzer output;
- b. Minimum and maximum one and eight-hour averages and other summary statistics for all reported parameters (e.g., NH₃, NT, NO_x, etc.);
- c. Data, which has exceeded the full-scale range of the ammonia analyzer, shall be flagged and manually verified against strip chart or continuous recorder outputs. A copy of the chart recorder outputs during periods in which the analyzer exceeds full-scale range will be provided with the report;
- d. Reasons for each hour of missing/invalid/flagged data shall be identified and explained;
- e. Details of all maintenance activities and any changes to instrumentation and standard operating procedures;
- f. Wind direction, wind speed, sigma theta and ambient temperature data;
- g. Results of all pre-calibration checks and unadjusted zero/span checks (from all channels used to report data);
- h. Results of all precision and zero/span checks (from all channels used to report data);
- i. Results of all analyzer calibrations (from all channels used to report data);
- j. Results of all NH₃ and NO₂ converter efficiency checks (from all channels used to report data);
- k. Certifications of standards and equipment used for calibrations, calibration checks and audits;
- l. Results of flow checks for calibration equipment; and,
- m. All final analyzer offset settings for all calibrations and zero/span checks (from all channels used to report data).

[Permit-to-Operate Permit No. 9423-AA011, Exhibit F.IV, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 42 and 42.1 through 42.13]

Fire Training Exercises

12. The Permittee may burn up to 250 gallons per day, not to exceed a total of 600 gallons per year, of uncontaminated fuel for fire training, in accordance with the requirements of this condition.

[Permit-to-Operate Permit No. 9423-AA011, condition 28, as amended through O/C Permit AQ0083TVP01, Revision 1, condition 43]

- 12.1 The Permittee shall provide notice to the public of open burning through local news media. The public notice must state the name of the person conducting the burn, a list of materials to be burned, a telephone number to contact the person conducting the burn before and during the burn, for a surprise fire drill, the address or location of the training and the beginning and ending dates of the period (not to exceed 30 days) during which a surprise fire drill may be conducted, and for open burning other than a surprise fire drill the expected time, date, and location of the open burning.

[Permit-to-Operate Permit No. 9423-AA011, condition 33, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 43.1]

- 12.2 The Permittee shall make a reasonable effort to respond to complaints about the burn, and keep, for at least 30 days, a record of all complaints received about the burn, including the name, address and telephone number of the complainant, a short summary of each complaint and a description of any action taken to respond to the complaint. Upon request the Permittee shall provide the department with a copy of the records kept under this subsection.

[Permit-to-Operate Permit No. 9423-AA011, Condition 34, as amended through O/C Permit No. AQ0083TVP01, Revision 1, condition 43.2]

Section 3 *Terms to make Permit Enforceable*

13. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 46.14, 18 AAC 50, and, except for those terms or conditions designated in the permit as not federally enforceable, the Clean Air Act, and is grounds for
 - 13.1 an enforcement action; or
 - 13.2 permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280.
14. It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.
15. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of the permit.
16. The permit may be modified, reopened, revoked and reissued, or terminated for cause. A request by the permittee for modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
17. The permit does not convey any property rights of any sort, nor any exclusive privilege
18. The Permittee shall allow the Department or an inspector authorized by the Department, upon presentation of credentials and at reasonable times with the consent of the owner or operator to
 - 18.1 enter upon the premises where an emission unit subject to the permit is located or where records required by the permit are kept;
 - 18.2 have access to and copy any records required by the permit;
 - 18.3 inspect any stationary source, equipment, practices, or operations regulated by or referenced in the permit; and
 - 18.4 sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

Section 4 *Permit Documentation*

- September 21, 2006 “Request for Title V Permit Revision and Title I Minor Permit”,
application submitted by Agrium for KNO Plant.
- January 10, 2007 Email from Jeanette Brena (Entrix) to Sally Ryan (ADEC) regarding
additional changes to permit conditions.

Response to Comments on Preliminary Minor Permit No. AQ0083MSS02
Agrium – Kenai Nitrogen Operations
Revisions to Title I Provisions

Prepared by Sally A. Ryan, May 29, 2007

This document provides the Alaska Department of Environmental Conservation's (Department's) reply to all public comments on the preliminary decision to revise Title I Permit revisions for Agrium U.S. Inc.'s (Agrium's) Kenai Nitrogen Operations (KNO) Plant, as authorized in Minor Permit No. AQ0083MSS01. The Department provided opportunity for public comment on the permit starting April 11, 2007 and ending May 11, 2007.

The comments are paraphrased below in Arial font. The Department's responses are shown in *Times New Roman italic font*.

Commenter: Agrium

Comments on the permit:

1. Preliminary Minor Permit Condition 6.1b (Draft Operating Permit Condition 8.1b)

Comment: Update condition 6.1b to also allow natural gas hydrogen sulfur testing via an equivalent method to length-of-stain detector tubes.

Basis: Agrium has been using a more accurate method that length of stain detector tube since gaining EPA approval on 2/24/04 (see attached EPA letter). The lowest hydrogen sulfide concentration that a detector tube can see is 10 ppm. Because Agrium's historical hydrogen sulfide concentration has been less than 10 ppm (see attached results from 2002 to 2007), the alternative testing method is more accurate at these low levels. Agrium requests that the ADEC be consistent with approved EPA monitoring methods.

Response: *Permit revised as requested, to allow Method D 5504-01 to measure hydrogen sulfide for this PSD avoidance/ambient air quality condition. The Department notes that Agrium did not provide details Method D-5504-01, so the Department is unable to verify the accuracy of the method compared to the length of stain method. In this case, because (1) the Department has already allowed Agrium to use this method to verify PSD avoidance/ambient air quality protection in the previous permit, (2) EPA approved it as an alternative for NSPS at this source, and (3) Agrium is far below the required limit (at least at this time), the Department finds it unnecessary to verify the method accuracy.*

2. Preliminary Minor Permit Condition 6.3b (Draft Operating Permit Condition 6.3b)

Comment: Revise the condition to state: "Reporting shall consist of an annual compliance certification under condition 76 (of O/C Permit No. AQ0083TVP01, Rev 1) that the natural gas hydrogen sulfide limit was not exceeded.

Basis: Agrium's historical hydrogen sulfide concentration has been less than 10 ppm (see attached results from 2002 to 2007). Because this is well under the 40-ppm limit, verifying compliance with the hydrogen sulfide limit in the annual compliance certification reports

should be sufficient for reporting purposes. Semiannual statements from the natural gas fuel supplier and/or semiannual sampling test results will be kept onsite for a period of no less than 5 years after collection date. The ADEC will have plenty opportunity to audit records in facility inspections and full compliance evaluations to confirm that the certification was true, accurate, and complete.

Response: The Department agrees that when H₂S level are low, inclusion of the semiannual statements from the fuel supplier or the sulfur content analysis is unnecessary in view of the fact that the documents will be on file for an inspector to review at any time. However, the Department is aware of circumstances where the H₂S level has increased over time. The Department has revised the condition to allow the Permittee to submit a compliance demonstration stating whether they comply with the 40 ppmv limit until the first time the fuel gas H₂S content exceed 32 ppmv (or 80 percent of the limit). After the first time the H₂S content exceed 32 ppmv, the Permittee is required to include the fuel gas H₂S documentation with the semi annual report

3. Preliminary Minor Permit Condition 8.3 (Draft Operating Permit Condition 10.3).

Comment: Revise the condition to state: "Reporting shall consist of an annual compliance certification under condition 76 (of O/C Permit No. AQ0083TVP01, Rev 1) that this unit fired only No. 1 or No. 2 fuel oil.

Basis: Source ID 63 is an insignificant emission unit based on operational restriction. The potential emissions are less than the threshold listed in 18 AAC 50.326(c) (i.e. less than 2 tpy of SO₂ emissions). Verifying compliance with the restriction for Source ID 63 to only fire No. 1 or No. 2 fuel oil in the annual compliance certification reports should be sufficient for reporting purposes. Records specifying the grades of all fuel received at the facility will be kept onsite for a period of no less than 5 years after collection date. The ADEC will have plenty opportunity to audit records in facility inspections and full compliance evaluations to confirm that the certification was true, accurate, and complete.

Response: The concept of insignificant under 18 AAC 50.326(c) applies to Title V operating permits, not Title I permits. That said, the Department recognizes that two tons of SO₂ emissions on an annual basis is a small contribution. However, the Department must also consider other bases for the permit condition.

The Department established the requirement to burn fuel with less than 0.5 wt%S in Permit No. 9923-AC004 for PSD avoidance. Upon review of the TAR for that permit, the Department also determined that the limit is necessary for ambient air quality protection (the most critical impact is on the 3-hour SO₂ AAQS, which is at 88 percent of the ambient standard).

*In this case, the low annual emissions are irrelevant, as the critical ambient standard is a short term standard. However, this is the **only** liquid fuel fired unit at the source. As such, the Department agrees that inclusion of the receipts with the semiannual operating report is unnecessary in view of the fact that the receipts will be on file for an inspector to review at any time.*

4. Preliminary Minor Permit TAR, Footnote 1, Page 4

Comment: Correct the second sentence: "The Department has re-instated all applicable conditions from the 1999 permit in Minor Permit No. AQ0083MSS02 as amended in O/C Permit No. AQ0083TVP01, Revision 1 and Minor Permit No. AQ0083MSS01."

Basis: Correction, sentence should state the first minor permit, not second.

Response: *The Department revised provisions of Permit No. 9923-AC004 Revision 1 in Minor Permit No. AQ0083MSS01. Therefore, the Department agrees and has revised the TAR as requested.*

5. Preliminary Minor Permit TAR, Department Finding 1, Page 5

Comment: Correct the three instances with the Permit-to-Operate is listed as No. 9423-AC011 rather than 9423-AA011. In addition, when referencing Construction Permit No. 9923-AC004 in the second sentence add Revision 1. Lastly, when stating "...9923-AC004 (as amended by the O/C permit..." in the sixth sentence add, "**(as amended by the O/C permit, 9923-AC0044 Revision 1, and AQ0083MSS01)**".

Basis: Correction of permits.

Response: *The Department agrees and has revised the TAR as requested.*

6. Preliminary Minor Permit TAR, Table 1 - #D, Department Findings

Comment: Delete the statement, "The Department established TVP conditions 11.1 and 11.2 as gap-filling (CP conditions 28.4 and 29.2.1 are for another limit) so not part of minor permit action."

Basis: ADEC made the requested revision to delete CP conditions 25 (part), 28.4, 29.2.1, and TVP conditions 11, 11.1, and 11.2. ADEC states that CP conditions 28.4 and 29.2.1 are for another limit and not part of the minor permit action. In actuality, those conditions require monitoring of natural gas consumption for boilers Source IDs 42-44 and 48-49 which have a fuel limit, and for the turbine Source ID 62 and Generator Source ID 64 which do not have a fuel limit and monitoring fuel quantity should not be required. ADEC made the requested revision to remove the monitoring language for Source IDs 62 and 64 in the preliminary minor permit and operating permit, so the note should be updated or deleted. All original requests by Agrium were made in these conditions.

Response: *The Department has revised the permit and TAR as follows.*

The lead in for condition 11 of the O/C permit, which requires that the Permittee only use natural gas in Units 62 and 64, was carried over from Permit 9923-AC004, but conditions 11.1 and 11.2 of the O/C permit were not. The citations for conditions 11.1 and 11.2 in O/C Permit No AQ0083TVP01 (18 AAC 50.350(g)-(i)) support the conclusion that the basis of these

conditions is for Title V gap-filling. The purpose of the statement in Table 1, Item D of the TAR is to clarify that the Permittee does not need a minor permit in order to delete conditions 11.1 and 11.2 of the O/C permit. The Department appropriately accomplished this action in the Title V permit significant revision that accompanied this minor permit.

Conditions 28.4 and 29.2.1 of Permit No. 9923-AC004, which require the Permittee to monitor, record, and report **the amount** of natural gas Units 42 through 44, have nothing to do with the requirement to **burn only** natural gas in Units 62 through 64. They are not the basis for conditions 11.1 and 11.2 of the O/C permit. As the provisions of conditions 28.4 and 29.2.1 Permit No. 9923-AC004, Revision 1 have nothing to do with condition 11 of the O/C permit, which the Department IS deleting, the Department did not delete these specific provisions of Permit No. 9923-AC004, Revision 1. Further, because the Department has rescinded Permit No. 9923-AC004 Revision 1, these provisions are included in Minor Permit No. AQ0083MSS01 in conditions 9.1 and 9.2.

The Department has revised the referenced statement in Table 1, Item D and the cover page of the minor permit accordingly.

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR PERMITS PROGRAM**

TECHNICAL ANALYSIS REPORT
For Air Quality Control Minor Permit No. AQ0083MSS02

Agrium U.S. Inc.
Kenai Nitrogen Operations Plant

TITLE I PERMIT REVISION

Prepared by: Sally A. Ryan, P.E.
Supervisor: Bill Walker
Date: Final – May 29, 2007

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ABBREVIATIONS/ACRONYMS

AAC.....	Alaska Administrative Code
ADEC.....	Alaska Department of Environmental Conservation
AS.....	Alaska Statutes
ASTM.....	American Society of Testing and Materials
C.F.R.	Code of Federal Regulations
CP.....	Construction Permit
EPA.....	Environmental Protection Agency
KNO.....	Kenai Operations Plant
NESHAPS.....	National Emission Standards for Hazardous Air Pollutants
NSPS.....	New Source Performance Standards
ORL.....	Owner Requested Limits
PSD.....	Prevention of Significant Deterioration
PTE.....	Potential to Emit
QAP.....	Quality Assurance Procedures
TAR.....	Technical Analysis Report
TVP.....	Title V Permit

Units and Measures

gr./dscf.....	grains per dry standard cubic feet (1 pound = 7,000 grains)
dscf.....	dry standard cubic foot
mmBtu.....	million British Thermal Units
ppm.....	parts per million
ppmv.....	parts per million by volume
tph.....	tons per hour
tpy.....	tons per year
wt%.....	weight percent

Pollutants

CO.....	Carbon Monoxide
CO ₂	Carbon Dioxide
HAPS.....	Hazardous Air Pollutants
H ₂ S.....	Hydrogen Sulfide
NH ₃	Ammonia
NO _x	Oxides of Nitrogen
NO ₂	Nitrogen Dioxide
NO.....	Nitric Oxide
PM-10.....	Particulate Matter with an aerodynamic diameter less than 10 microns
S.....	Sulfur
SO ₂	Sulfur Dioxide
VOC.....	Volatile Organic Compound

1.0 Introduction

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Air Quality Control Minor Permit No. AQ0083MSS02 to Agrium U.S. Inc. for the Kenai Nitrogen Operations (KNO) Plant. This minor permit revises Title I provisions listed in Permit No. 9923-AC004, Revision 1¹ and Operating/Construction (O/C) Permit No. AQ0083TVP01, Revision 1.

1.1 Stationary Source Description²

The KNO Plant produces ammonia (NH₃) and urea for bulk sales. There are two NH₃ and two urea production plants at the KNO Plant. The NH₃ plants convert natural gas with added steam and air to produce NH₃ and carbon dioxide (CO₂). Feed stocks for the urea plant include CO₂ and NH₃. The two utility plants generate the power and steam needed to operate the NH₃ and urea plants.

The KNO Plant is a Prevention of Significant Deterioration- (PSD-) Major stationary source.

1.2 Permit History

Prior to issuance of Minor Permit No. AQ0083MSS02, Agrium operated the KNO Plant under the following permits, in order of issue or latest revision date:

Construction Permit No. 9423-AA001 (expired, incorporated in the title V permit). There is no TAR for this permit. The permit carries forward NO_x PSD avoidance, Prill Tower visible emissions and particulate matter monitoring, NH₃ ambient air protection, and fire-training (to prevent black smoke) provisions from Permit No. 9223-AA001 as amended through August 12, 1994.

Construction Permit No. 9923-AC001, Revision 1, revised July 14, 2003.³ The initial permit authorized the Co-Generation (Co-Gen) Project. The Co-Gen project consisted of installing a GE Frame 6 turbine, a Detroit diesel engine, and a Heat Recovery system (Units 62, 63, and 64 in O/C Permit No. AQ0083TVP01 Rev 1); and decommissioning seven Fairbanks-Morse engines. The permit contains owner requested limits (ORLs) to avoid classification as PSD for Sulfur Dioxide (SO₂). The ORL's are also for SO₂ ambient air quality protection (see "Owner Requested Limits" and "Ambient Air Quality Information" sections of the TAR for Initial Permit No. 9923-AC004, included as Attachment 1). In Revision 1, the Department made permit hygiene changes (TAR for Revision 1 attached as Appendix B). The permit also contains some

¹ As described in *Department Findings*, Item (1), Permit AQ0083MSS02 rescinds Permit No. 9923-AC004, Revision 1 entirely. The Department has re-instated all applicable conditions from Permit No. 9923-AC004 in Minor Permit No. AQ0083MSS02, as amended in O/C Permit No. AQ0083TVP01, Revision 1 and Minor Permit No. AQ0083MSS01.

² Plant description from O/C Permit No. AQ0083TVP01, Revision 1 Statement of Basis, page 2.

³ The Department carried all applicable conditions from Construction Permit No. 9923-AC004 Revision 1 into initial O/C Permit No. AQ0083TVP01, as described in Table B of the Statement of Basis. Because the Department intentionally amended Permit No. 9923-AC004, Revision 1, the conditions in Permit No. 9923-AC004 Revision 1 are SUPERSEDED by conditions in O/C Permit No. AQ0083TVP01, Revision 1.

provisions from the from the 1998 Consent Decree regarding Standard Operating Procedures and a Combustion Efficiency Management Program.

Minor Permit No. AQ0083MSS01, issued August 8, 2005. Permit No. AQ0083MSS01 repealed New Source Performance Standard monitoring provisions in conditions 32.4, and 33.5.1 of Construction Permit No. 9923-AC004, Revision 1, and replaced them with new provisions.

Operating/Construction (O/C) Permit No. AQ0083TVP01, revised October 21, 2005. This is both a Title V operating and a Title I construction permit. The permit amended provisions of Construction Permit No. 9423-AA011 (a pre-1997 permit to operate, which has expired) and Permit No. 9923-AC004, Revision 1. This permit expires on December 31, 2008.

1.3 Application Description

Agrium submitted a “Request for Title V Permit Revision and Title I Minor Permit” on September 21, 2006, with addenda through January 10, 2007. The application requests an integrated review to significantly revise the operating permit and issue the Title I minor permit. The Department intends to conduct an integrated review, but this TAR only addresses the Title I minor permit portions of the application.

A summary of the application is discussed in item (1) of the Department findings.

1.4 Department Findings

The Department made the following findings regarding Agrium’s application:

- (1) At the time of the application, the KNO Plant operated under Construction Permit No. 9923-AC004, Revision 1, Minor Permit No. AQ00083MSS01, and O/C Permit No. AQ0083TVP01, Revision 1. The O/C permit incorporated the provisions of pre-1997 Permit-to-Operate No. 9423-AA011, Construction Permit No. 9923-AC004 Revision 1, and Minor Permit No. AQ0083MSS01. In the initial O/C permit, the Department intentionally revised some of the provisions carried over from Permit No.’s 9423-AA011 and 9923-AC004 Revision 1, **but did not specifically rescind the original conditions**. This was appropriate at the time, but an unforeseen consequence is that these revisions will expire when the O/C permit expires. The requirement technically will revert to the original requirements listed in Permit No.’s 9423-AA011 and 9923-AC004 Revision 1. Therefore, in Minor Permit No. AQ0083MSS02, the Department has re-instated ALL applicable provisions of Permit No.’s 9423-AA011 and 9923-AC004 Revision 1 (as amended by the O/C permit, Permit No. 9923-AC004, Revision 1, and Permit No. AQ0083MSS01). (In Minor Permit No. AQ0083MSS02, the bracketed citation for each reinstated provision indicates from which permit the reinstated provision came.) The provisions will remain in effect until modified or rescinded by the Department in another Title I permit. The Department will rescind Permit No. 9923-AC004, Revision 1. There is no need to rescind Permit No. 9423-AA011 as it has expired. The Department will rename the “Operating/Construction” permit to “Operating Permit”. Minor Permit No. AQ0083MSS01 will continue to exist as a separate Title I permit.

- (2) Table 1 shows a summary⁴ of Agrium’s specific requests and the Departments findings for each request.

Table 1 – Minor Permit Application Requests and Department Findings^a

Application Request	Department Finding
A. Revise CP Page 1 Facility Contact	The Department has rescinded CP. Minor Permit No. AQ0083MSS02 reflects request.
B. Add a condition to CP that states that Sections B, C, G, and H are replaced and rescinded with new general conditions in TVP ^a .	Not necessary. The Department has rescinded CP.
C. CP, condition 21, 22.2, and 22.3 (TVP conditions 10, 10.1, and 10.2). Delete - req’t no longer has regulatory basis.	The Department based these conditions on SEPs ^a in the 1998 Consent Decree. ^b Agrium requested and obtained a termination of that Decree, so the legal obligation to continue with the SEPs no longer exists. The Department has rescinded the CP, and did not reinstate these conditions in Permit No. AQ0083MSS02.
D. CP conditions 25 (part), 28.4, 29.2.1 (TVP conditions 11, 11.1, and 11.2). Delete – unnecessary. Units not equipped to fire any fuel other than natural gas.	<p>Agrium has certified in their application that the units are only equipped to fire natural gas; therefore, the Department can remove the condition as requested. (This requirement is for PSD modification avoidance and ambient air quality protection for SO₂. As described in the TAR for Permit No. 9923-AC004, the increase in SO₂ emissions at the time the Department established the requirement in Permit No 9923-AC004 was 16.5 tpy of SO₂. The most critical effect on ambient air is for the 3-hour SO₂ AAAQS, at 88 percent. Therefore, if Agrium ever wants to reconfigure to fire liquid fuel, they will need a permit under 18 AAC 502 or 18 AAC 306 before they will be able to increase SO₂ emissions enough to exceed the previously established PSD avoidance or ambient air quality protection limit.) The Department notes that in the Title V permit, Agrium is still required to show compliance with the visible emission standard by certifying that the units fire only natural gas.</p> <p>The Department established MR&R in conditions 11.1 and 11.2 of the O/C permit as gap-filling mr&r. Therefore, it is not necessary to remove these conditions in a Title I permit. The Department has appropriately removed these requirements as part of the accompanying TVP significant revision. The Department did not delete CP conditions 28.4 and 29.2.1. These requirements are not related to condition 11 of the O/C permit and are not part of this minor permit action.</p>
E. CP condition 26 (part), 28.3, and 29.2.4 AND delete TVP condition 14, 14.1, and 14.2. Delete – specs for diesel fuel requiring sulfur content less than 0.5 wt%S, therefore no need to limit fuel sulfur.	<p>The unit is capable of combusting liquid fuel other than No. 1 or No. 2 diesel. The Department revised the condition to combust only No. 1 or No. 2 diesel fuel, as such the only necessary monitoring is certification of fuel grade.</p> <p>The Department established TVP condition 14.2 as gap filling (CP conditions 29.2.4 is included in the TVP as condition 14.1 and 5.1-5.2).</p>

⁴ Refer to the September 21, 2006 application for more detail on each request.

Application Request	Department Finding
F. TVP, condition 38 and 38.1. Reference KNO QAP, rather than Alaska QAM only. ^d	The Department has not approved the KNO QAP at the time of this minor permit, ^c therefore Department retained the reference to the Alaska Quality Assurance Manual.
G. TVP, condition 38.2 – Revise condition to state “quarterly audits performed by a qualified individual or firm that is not responsible for the routine maintenance of the station.”	It is important that an independent entity perform the quarterly audits, therefore, the Department did not revise as requested. The Department has clarified the meaning by including the phrase “prepared by an individual other than the individual responsible for routine maintenance” to differentiate this requirement from the annual performance audits, which must be performed by an independent firm.
H. TVP, condition 38.3. Remove – condition 38.2 references quarterly audits.	Department must retain requirement for independent audit by an outside firm at least once per year. Did not remove requirement.
I. TVP condition 41 and 42. Update by adding following phrase: “unless the Permittee elects to report per the Quarterly Data Summary and Annual Data Report formats as approved by both the ADEC Air Monitoring Group and Compliance Technician.”	The requested change is acceptable. (Note that The Department prefers annual reporting in accordance with the approved Annual Data Report Form, ^c but will not require it for this non-PSD pollutant.)
J. TVP, condition 42.3 and 42.13. Update condition 42.3 to remove reference to strip chart – technology has been updated and replaced. Update condition 42.13 to remove reference to potentiometer settings and replace with offset settings – technology has been updated and replaced.	The Department prefers to retain reference to strip chart, but has updated to include a continuous recorder. ^c The Department removed reference to potentiometer setting and replaced with offset settings, as requested in application.

^a In this table, CP means Construction Permit No. 9923-AC004, Rev 1, TVP means O/C Permit No. AQ0083TVP01 (Rev 1), QAP means Quality Assurance Procedures, QAM means Quality Assurance Manual, SEP means Supplemental Environmental Project, AAAQS means Alaska Ambient Air Quality Standards, and HRSG means Heat Recovery Steam Generator.

^b The 1998 Consent contained two Supplemental Environmental Projects (1) Combustion Efficiency Monitoring Program (CEMP) and (2) an Ammonia Emissions Reduction System. SEP #1 (the CEMP) required the Permittee to develop and implement an operations and maintenance program to monitor HC and CO from all units above five million British thermal units per hour (mmBtu/hr). The purpose was “continued minimization” of HC and CO emissions from these units by using defined monitoring, operation, and maintenance procedures. SEP #2 required the Permittee to install and operate an ammonia recovery, scrubber, and flare system, and limited ammonia emissions to 106 tpy based on a monthly rolling average. In addition, the SEP required the Permittee to maintain and operate ammonia Plant 1, Urea Plant 2, and the “Ammonia Emissions Reduction System” in a manner consistent with good air pollution control practices at all times, including during periods of startup, shutdown, and malfunction. SEP #2 included a requirement to operate the Ammonia Emissions Reduction System when the Plant operates, except for routine maintenance and repair of the system. Finally, SEP #2 required the Permittee to report annual ammonia emissions to the EPA for five years.

^c Based on telephone conversation with Richard Heffern (Department Monitoring Group Staff) December 27, 2006.

^d In an application supplement dated January 10, 2007, Agrium requested additional edits to conditions 38 and 39 of O/C Permit No. AQ0083TVP01. In the supplement, Agrium also requested that the Department delete condition 39 and 40, and reformat conditions 41 and 42 of O/C Permit No. AQ0083TVP01. Email dated January 10, 2006 from Jeanette Brena (Entrix) to Sally Ryan (Department) for more detail on requests. The Department has incorporated the changes in to the minor permit as requested in the application supplement.

- (3) The revisions described in the application will not change the PTE of any regulated air pollutant; therefore, the Department will not revise the stationary source wide assessable PTE listed in condition 1.1 of Operating Permit No. AQ0083TVP01 Rev 1.
- (4) Under 18 AAC 50.542(f)(9), the Department finds that Permit No. AQ0083MSS02 will require the owner or operator to comply with all applicable requirements of 18 AAC 50.
- (5) KNO is located in a coastal district. However, the Department does not require a Permittee to submit a Coastal Project Questionnaire for a minor permit required under 18 AAC 50.508(6), and notification of the local district and resource agencies is not necessary.

2.0 Permit Conditions

2.1 Requirements for all Minor Permits.

As described in 18 AAC 50.544(a), this minor permit identifies the stationary source, the project, the permittee, and contact information. This minor permit does not change assessable emission fee requirement already listed in the Title V permit.

2.2 Requirements for a Minor Permit that Revises or Rescinds a Previous Title I Permit

As described in 18 AAC 50.544(i) a minor permit classified under 18 AAC 50.508(6) must contain terms and conditions as necessary to ensure that the permittee will construct and operate the stationary source in accordance with 18 AAC 50.

2.2.1 NO_x PSD Avoidance Requirements

The Department carried over NO_x PSD avoidance requirements from Permit No. 9423-AA001 into in O/C Permit No. AQ0083TVP01. The Department revised some of the requirements in the O/C permit. The Department is reinstating the provisions in this minor permit, so the revisions do not “go away” when the operating permit expires.

The Department did not change these provisions in Minor Permit No. AQ0083MSS02.

2.2.2 SO₂ PSD Avoidance and Ambient Air Quality Protection Requirements

The Department carried over these SO₂ PSD avoidance and ambient air quality protection requirements from Permit No. 9923-AC004 as revised through July 14, 2003. The basis for these requirements is contained in the TARs for Permit No. 9923-AC004 and 9923-AC004 Rev 1, attached as Appendices A and B.

The Department established new fuel sulfur H₂S monitoring in Minor Permit No. AQ0083MSS02. (The monitoring had previously referred to the NSPS monitoring, which was problematic for the Permittee.)

2.2.3 Prill Tower and VE Requirements

The Department reinstated this requirement unchanged from Permit No. 9423-AA011.

2.2.4 NH₃ Ambient Air Quality Protection Requirements

The Department reinstated these requirements from Permit No. 9423-AA011, as amended through O/C permit No. AQ0083TVP01 Rev 1.

2.3 Terms to make Permit Enforceable

The minor permit contains additional requirements as necessary to ensure that Agrium will construct and operate the stationary source or modification in accordance with 18 AAC 50, as described in 18 AAC 50.544(i).

3.0 Permit Administration

This minor permit rescinds Permit No. 9923- -AC004, Revision 1.

This minor permit rescinds and replaces conditions 7 (lead-in only), 7.1 through 7.3, 7.5, 8 (lead-in only), 12 (lead-in only), 12.1, 13 (lead-in only), 13.1, 13.2, 14, 15 (lead-in only), 15.1, 15.2, 38 (lead-in only), 38.1, 38.2, 38.3, 41, 42 (lead-in only), 42.1 through 42.13, 43, 43.1 and 43.2 of O/C Permit No. AQ0083TVP01, Revision 1.

This minor permit rescinds condition 11, 39, and 40 of O/C Permit No. AQ0083TVP01, Revision 1.

The Department considers the changes authorized in this permit to be Clean Air Act Section 502(b)(10) for the purpose of Title V permitting, except for the changes to Conditions 39, 40, 41, and the lead in to condition 42 of O/C Permit No. AQ0083TVP01 Revision 1. The Permittee may operate in accordance with the Section 502(b)(10) changes upon issuance. The Permittee must still comply with the provisions of Conditions 39, 40, 41, and the lead in to condition 42 listed in O/C Permit No. AQ0083TVP01 Revision 1 until the Department issues a revised Title V permit.

The Department will incorporate the provisions of Minor Permit No. AQ0083MSS02 into draft Permit No. AQ0083TVP01, Revision 2, and will submit the draft operating permit to EPA for their review. Federal regulations allow EPA up to forty-five days for their review. If EPA does not reply within this time, then the request is deemed acceptable. Once EPA completes its review, then Agrium may start operation under the terms and conditions of Minor Permit No. AQ0083MSS02.

Attachment 1

Permit No. 9923-AC004 TAR

**(Inserted as Word document, formatting and page numbers may be
different from original)**

TECHNICAL ANALYSIS DOCUMENT

Union Oil Company of California
Alaska Nitrogen Products, LLC
Co-Generation Project

This report contains the technical and regulatory basis for Applicable Requirements under Alaska Air Quality Control Regulations 18 AAC 50

Final Decision Document

September 15, 1999

Alaska Department of Environmental Conservation
Air Quality Maintenance Section
Construction Permits
410 Willoughby Avenue, Suite 105
Juneau, AK 99801-1795

INTRODUCTION AND FINDINGS

The applicant, UNOCAL, Alaska Nitrogen Products, LLC, operates an ammonia and urea manufacturing plant located in Kenai, Alaska. The plant's most recent operating permit is Air Quality Control Permit No. 9423-AA011. A Title V permit application has been submitted and determined to be complete. Therefore, the Kenai Plant presently operates under the shield created by submitting a complete operating permit application under AS 46.14.275.

On November 24, 1998, the Department received UNOCAL, Alaska Nitrogen Products, LLC's (Kenai Plant) Air Quality Construction Permit Application for a co-generation project (Co-Gen Project) at the ammonia and urea manufacturing plant. UNOCAL proposes to move a turbine and start-up engine from the Alaska Electric Generation and Transmission, Inc. (AEG&T), plant in Soldotna, Alaska (Soldotna Power Plant), to the Kenai Plant, install a heat recovery steam generator (HRSG), and decommission seven existing gas-fired Fairbanks-Morse (F-M) internal combustion (IC) engines. The changes at the Kenai Plant would also involve limiting the operation of five existing package boilers and adjusting the operation and usage of Solar turbines and CO₂ compressors. On February 23, 1999, and March 22, 1999, the Department received supplemental information in response to requests in the completeness determination dated February 1, 1999. Additional information was received by the Department on April 23, 1999, following a compliance test of the Frame 6B turbine at the Soldotna Power Plant site.

Based on the review of UNOCAL's Air Quality Control Construction Permit Application, the Department finds that UNOCAL proposes to:

1. Relocate a General Electric (GE) Frame 6B Turbine, Model MS6001B, Serial No. TN 282612, Source No. GGT-1746, and a 650hp Detroit Diesel Startup engine, Source No. GSE-1746, from the AEG&T Soldotna Power Plant;
2. Purchase and install an HRSG, Source No. B-707, with the Frame 6B Turbine system to more fully utilize system energy;
3. Decommission seven F-M IC engines;
4. Adjust the permitted operations of existing compressors and waste heat boilers;
5. Request limits to avoid project classification as a major modification as classified in 18 AAC 50.300(h)(3) subject to Prevention of Significant Deterioration (PSD) review; and
6. The Kenai Plant Co-Gen Project, as limited by the proposed permit action, has the potential to increase emissions by 16.5 tons per year (tpy) of SO₂, 4.38 tpy of PM, and 5.6 tpy of VOCs; all other potential emissions will be reduced.

The Co-Gen Project will be subject to the following limits and standards incorporated in the Department's Air Quality Control Regulations, 18 AAC 50:

1. All emission sources, including those associated with construction activities, are subject to prohibitions listed in 18 AAC 50.045 regarding bulk material handling, dispersion techniques, and construction, operation, or modification of sources that will violate an applicable air quality standard;

2. The Co-Gen Project and associated process emissions are subject to the Fuel-Burning Equipment and Industrial Processes limits set out in 18 AAC 50.055.
3. The Co-Gen Project and associated process emissions are subject to the Air Pollution Prohibition listed in 18 AAC 50.110, and must not be injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.
4. The GE Frame 6B Turbine is an affected facility subject to federal emissions standards incorporated by reference in 18 AAC 50.040(1) and 18AAC 50.040(2)(V) Subpart GG for Stationary Gas Turbines.
5. The HRSG unit is an affected facility subject to federal emissions standards incorporated by reference in 18 AAC 50.040(1), 18 AAC 50.040(2)(B) Subpart D for Fossil-Fuel-Fired Steam Generators, and 18 AAC 50.040(2)(D) Subpart Db for Industrial—Commercial—Institutional Steam Generating Units.
6. ADEC found that UNOCAL's application and supplemental submissions include the information needed for a construction permit. As such, the Department prepared a preliminary decision;
7. The Co-Gen project is subject to project review for consistency under the Alaska Coastal Management Program (ACMP).

OWNER REQUESTED LIMITS

UNOCAL has proposed to limit the operation of the waste heat boilers and package boilers in order to reduce emissions sufficiently to avoid classification as a major modification. The package boilers, Sources B600A-C and B700A-B, will be limited to burning no greater than 3,250 mmscf of natural gas per 12-month period for all five boilers. The Detroit Diesel start-up engine, Source GSE-1746, will be limited to burning no more than 2,000 gallons of fuel per 12-month period and use fuel with a sulfur content of no more than 0.5 percent by weight. The applicant has also proposed to remove the Fairbanks-Morse engines, Sources GG-644A-G, from service.

Summary of Criteria Pollutant Emissions for the Proposed Co-Generation Project

Source	NO_x (tons/year)	SO₂ (tons/year)	PM/PM10 (tons/year)	CO (tons/year)	VOCs (tons/year)
GE Turbine	679	12.6	ND	2.06	ND
Startup Engine	0.43	0.068	0.01	0.12	0.01
HRSG	206	13.6	15.7	165	39.2
Comp. Engines	46.3	0.11	0.79	6.5	1.89
Solar Turbines	148	2.2	14.1	37.1	8.1
W. H. Boilers	(9.5)	(0.63)	(0.72)	(8.00)	(0.52)
F-M Engines	(868)	(2.1)	(14.8)	(122.2)	(35.4)
Package Boilers	(395)	(9.3)	(10.7)	(118.4)	(7.7)
Total	(193)	16.5	4.38	(37.8)	5.6
PSD Threshold	40	40	25	100	40

ND = Not detected

On pages 19-23 of the application, UNOCAL derived credits for the units to be removed from service from actual operation records and emission factors derived from AP-42 tables or stack monitoring.

Operational/emission limits

18 AAC 50.300(h)(3)(B)(vi) classifies any project at a PSD major facility with a NO_x, SO₂, or VOC emission increase of 40 tons per year or greater or a CO emission increase of 100 tons per year or greater as a PSD significant modification. The Co-Gen project has a Potential To Emit greater than these thresholds. However, UNOCAL will avoid this classification due to the net affect on emissions from the combination of the projected emission increases from the new equipment and the decreases in emissions from both decommissioning the F-M engines and decreasing firing rates of the existing waste heat and package boilers.

AMBIENT AIR QUALITY INFORMATION

The Kenai Plant is an existing major facility as classified under 18 AAC 50.300(c)(1) and emits, or has the potential to emit, 250 tons per year or more of a regulated air contaminant in an area designated attainment or unclassifiable for that air contaminant under 18 AAC 50.015.

UNOCAL's proposed addition of the Co-Gen equipment would constitute a modification to an

existing major facility under 18 AAC 50.300(h)(2), as UNOCAL is proposing to increase actual SO₂ emissions and PM emissions.

SO₂ Emissions

The Department reviewed the 1997 TESORO Refinery Expansion Project and has initiated review for a 1999 PSD permit at the refinery under the construction permit program. TESORO included an ambient impact assessment for their project at the Nikiski Refinery next to UNOCAL's Kenai Fertilizer Plant. The assessment included existing measurements of ambient concentrations with existing impacts from the UNOCAL, Phillips, and TESORO facilities in the area from the UNOCAL/TESORO Ambient Monitoring Program (UTAMP) Site 2 monitoring station. This station is located in the northeastern region of the TESORO refinery.

The Department accepted the monitored values as representative of the existing concentrations of SO₂ emissions in the Cook Inlet area near the TESORO site. The maximum ambient concentrations of SO₂ were: 3-hour averaging period = 77.2 micrograms per cubic meter (µg/m³); 24-hour averaging period = 25.6 µg/m³; and annual averaging period = 1.1 µg/m³ (Table 1 from the TESORO Nikiski Refinery Expansion Project preliminary technical analysis report (TAR), 1999).

The predicted worst-case SO₂ ambient impacts from the preliminary 1999 TESORO TAR are: 3-hour = 1140.9 µg/m³; 24-hour = 181.1 µg/m³; and Annual = 7.1 µg/m³ (Table 2). Increment consumption by the TESORO project is predicted to be: 3-hour = 199.1 µg/m³ (38.9% of allowable increment); 24-hour = 69.43 µg/m³ (76.3% of allowable increment); and Annual = 6.0 µg/m³ (30.1% of allowable increment) (Table 4). The Department recommended using the maximum SO₂ concentration monitored as a conservative background concentration in the TESORO-Nikiski Refinery construction permit preliminary technical analysis report of July 1999. The UNOCAL Kenai Plant is adjacent to the TESORO refinery, so the Department will use the results of the TESORO 1999 SO₂ assessment for the permit decision for the Co-Gen project. At this time, the TESORO Nikiski Refinery 1999 Project has not been permitted.

Worst-Case

Table 1: UTAMP Ambient Concentrations

Pollutant	Averaging Period	Max. UTAMP Concentration (µg/m ³)	De Minimus Monitoring Concentration (µg/m ³)	AAQs (µg/m ³)
SO ₂	3-hour	77.2	NA	1,300
	24-hour	25.6	13.0	365
	Annual	1.1	NA	80

Table 2: AAAQS Analysis

Pollutant	Avg. Period	Maximum Modeled Concentrations ($\mu\text{g}/\text{m}^3$)		Bkgd Conc. ($\mu\text{g}/\text{m}^3$)	TOTAL IMPACT: Max conc. plus bkgd ($\mu\text{g}/\text{m}^3$)	Ambient Standard ($\mu\text{g}/\text{m}^3$)
		TESORO Sources	Off-site Sources			
SO ₂	3-hour	1062.7	1.0	77.2	1140.9	1300
		1063.7	NA	77.2	1140.9	
	24-hour	154.5	1.0	25.6	181.1	365
		155.5 ¹	NA	25.6	181.1	
		155.5 ²	NA	25.6	181.1	
	Annual	0.2	5.8	1.1	7.1	80

Table 4: PSD Increment

Area	Pollutant	Averaging Period	UTM Easting meters	UTM NORTHIN G METERS	Modeled $\mu\text{g}/\text{m}^3$	Allowable Increment $\mu\text{g}/\text{m}^3$	PERCENT OF ALLOWABLE %
Class II	SO ₂	2 nd Hi 3hr	589237.00	6728422.00	199.1	512	38.9
		2 nd Hi 24 hr	589189.00	6728422.00	69.4	91	76.3
		ADEC	58189.00	6728422.00	69.43		76.3
		Annual	589117.00	6728422.00	6.0	20.0	30.1

The Department agreed with UNOCAL on August 30, 1999, that UNOCAL would conduct an independent SO₂ ambient air impact assessment in support of the Co-Gen project, subject to Department review independent of this permit action. This assessment is presently not completed.

PM10 Emissions

An analysis of meteorological and monitoring data for the UNOCAL prill towers was performed by UNOCAL and submitted to EPA for approval on February 3, 1998. The proposed 24-hour background concentration of 37 $\mu\text{g}/\text{m}^3$ was approved by ADEC and EPA. Monitoring at Bernice Lake from the second quarter of 1990 to the first quarter of 1991 was approved by ADEC and EPA to represent the annual average background concentration of 7.8 $\mu\text{g}/\text{m}^3$.

The total impact represents the sum of the worst background concentration and the worst predicted impact. Monitoring and modeling for PM₁₀ concentrations established that the 24-hour maximum predicted impact is 99.3 µg/m³, and the annual maximum concentration is 19.8 µg/m³. The total 24-hour concentration is 136.3 µg/m³, which is below the national ambient air quality standard (NAAQS) limit of 150 µg/m³. The total annual impact is 27.6 µg/m³, which is below the NAAQS limit of 50 µg/m³.

The applicant has requested operational limits as described above in the Owner Requested Limits section. These limits will cap emissions and effectively control ambient impacts from the plant, as well.

If an adverse ambient effect is suspected, the Department may use its regulatory discretion to require UNOCAL to:

1. Provide information, maintain records, and provide reports on the nature and amount of emissions from the source as described in 18 AAC 50.200;
2. Conduct an ambient air quality investigation upon a finding by the Department that the facility has a reasonable likelihood of causing or significantly contributing to ambient concentrations of one or more air contaminants that exceed an ambient air quality standard, maximum allowable standard, maximum allowable ambient concentration, or on the limitations of 18 AAC 50.110 that are at issue as provided by 18 AAC 50.201(a); and
3. Reduce emissions or implement another control strategy to reduce the ambient impact of those emissions, as necessary, to ensure the concentrations of air contaminants in the ambient air do not exceed the ambient air quality standards, maximum allowable ambient concentrations, or the limitations of 18 AAC 50.110.

EMISSION LIMITS AND PROHIBITIONS

State Emission Standards

Process emissions generated from the operation of the Co-Gen project are subject to visible emission limits listed in 18 AAC 50.055(a), particulate matter emission limits as listed in 18 AAC 50.055(b), and sulfur compound emission limitations described in 18 AAC 50.055(c). Fugitive dust emissions resulting from handling, transportation, or storage of bulk materials during construction or operation of the Co-Gen project, are prohibited under 18 AAC 50.045(d).

The Co-Gen project and any site-specific pre- and post-construction activities are subject to the Air Pollution Prohibition described in 18 AAC 50.110.

Visible Emissions

Visible emissions (VE), excluding condensed water vapor, generated by an industrial process or fuel burning equipment, are subject to 18 AAC 50.055(a).

The GE Frame 6B Turbine is subject to the 18 AAC 50.055(a)(1) requirement. It should comply with the VE emission requirement because it burns only natural gas. The Visible Emission Observation Form of the GE turbine at the AEG&T Soldotna Plant for surveillance conducted on

February 10, 1999, by an ADEC observer, showed an opacity reading of 0-5%. This is well under the applicable 20% standard.

The Detroit Diesel startup engine is subject to the 18 AAC 50.055(a)(1) requirement. Based on review of visible surveillance records completed on internal combustion engines, the Department finds that these types of engines generally do not exceed this visible emission standard.

The Heat Recovery Steam Generating (HRSG) unit is subject to the 18 AAC 50.055(a)(1) requirement. Visible emissions, excluding condensed water vapor, from the HRSG may not reduce visibility by greater than 20 percent for a total of more than three minutes in any one hour as listed in 18 AAC 50.055(a)(1) and Condition 34. The HRSG Unit should comply with the VE standards because it will burn only natural gas, a clean burning fuel. A review of inspection records from April 8, 1996, and October 12, 1998, of the Kenai Plant shows that all units, including existing HRSG units connected to the Solar Turbines, are in compliance with the VE standards listed in 18 AAC 50.055(a)(1). The Department believes that past compliance with the standards is further support that the new HRSG unit will comply with the standards.

VE monitoring and recording is required for the HRSG unit, Source B-707, and the Detroit Diesel start-up engine, Source GSE-1746. VE monitoring and recording for Source B-707 must be conducted no less than once each month because of the potential reaction favoring conversion of NO to NO₂, a brownish, colored gas. VE monitoring and recording for Source GSE-1746 must be conducted no less than once every 12 months. These requirements are listed in Conditions 15 and 36.2 of the permit.

Particulate Matter

Particulate matter emissions from an industrial process or fuel-burning equipment are subject to 18 AAC 50.055(b).

The HRSG unit, the Frame 6B turbine, and the Detroit Diesel engine for the Co-Gen project are subject to the particulate-matter emission standard in 18 AAC 50.055(b)(1). PM emissions from each unit may not exceed 0.05 grains per cubic foot of exhaust gas. Calculations of compliance with the standard are in Appendix B. The combustion turbine's projected PM emissions will be 0.01 gr/dscf, the HRSG emissions are projected at less than 0.01 gr/dscf, and the Detroit Diesel start-up engine's projected emissions are 0.043 gr/dscf. Therefore, the Department called for discretionary PM testing in Condition 36.1

Sulfur Compounds

Sulfur-compound emissions, expressed as sulfur dioxide (SO₂) from an industrial process or fuel-burning equipment are subject to 18 AAC 50.055(c).

The Frame 6B turbine, HRSG, and start-up engine are subject to 18 AAC 50.055(c)(1). Emissions from the sources may not exceed 500 ppm SO₂ averaged over a period of three hours. The Department requires the applicant to monitor and report compliance with fuel sulfur limits as listed in Conditions 33.4 and 35. The Kenai Plant's natural gas contract specifies that the fuel supplied will contain less than 40 ppm by volume sulfur compounds. The Frame 6B turbine and HRSG will not exceed the standard, as 40 ppm is significantly less than 4,355 ppm gas H₂S concentration representative of compliance with the 500 ppm exhaust standard. The start-up engine fuel limit of 0.5% sulfur is below the 0.74% content representative of fuel oil fired engine

compliance with the 500 ppm exhaust standard. Therefore, compliance with the fuel limits will ensure compliance with the sulfur compound limit. Calculations of compliance with standards are in Appendix B.

Fugitive Emissions

Industrial, construction, or bulk material handling, transport, and storage activities associated with a regulated facility are required to take reasonable precautions to prevent the emissions of particulate matter, as described in 18 AAC 50.045(d).

The applicant proposes to: 1) move the GE Frame 6B turbine and the Detroit Diesel start-up engine from the Soldotna Power Plant to the Kenai Plant and install; 2) purchase and install an HRSG engine at the Kenai Plant to use the excess heat from the Frame 6B turbine; 3) decommission 7 F-M internal combustion engines; and 4) adjust the usage rates of the existing waste heat and package boilers in conjunction with the increase in power output by the GE turbine.

There are no major earth moving or bulk material handling activities expected to be associated with the Co-Gen project.

Therefore, the Department does not propose any conditions for the Co-Gen project for compliance with the prohibition detailed in 18 AAC 50.045(d).

Federal Emissions Standards

New Source Performance Standards (NSPS)

The U.S. Environmental Protection Agency (EPA) regulates New Source Performance Standards (NSPS). The intent of NSPS is to provide technology-based emission control standards. EPA may delegate to each state the authority to implement and enforce standards of performance for new stationary sources located in that state. The Department has incorporated by reference the NSPS for specific industrial activities, as listed in 18 AAC 50.040. However, EPA has not delegated to the Department the authority to administer the NSPS program at this time.

The GE Frame 6B Turbine is subject to Subpart GG for Stationary Gas Turbines because it is rated greater than 10.7 gigajoules per hour (10 MMBtu/hr), based on the lower heating value of fuel fired, and was constructed, modified, or reconstructed after October 3, 1977.

The HRSG unit is subject to Subpart D and Subpart Db because it is a fossil-fuel-fired stream-generating unit with a heat input rate of more than 250 mm BTU/hr for Subpart D, and a heat input capacity of greater than 100 mm BTU/ hr that was constructed, modified, or reconstructed after June 19, 1984, for Subpart Db.

An affected facility subject to an NSPS Subpart is also subject to Subpart A, General Provisions.

The Kenai Plant is subject to the following Federal NSPS regulations incorporated by reference in 18 AAC 50.040:

Subpart A:

All NSPS-affected facilities at the Kenai Plant are subject to 40 CFR 60, Subpart A, General Provisions. **General reporting requirements are set out in Condition 30 of this permit.**

40 CFR 60.7 contains Notification, Monitoring, Record Keeping, and Reporting requirements. For the Frame 6B turbine and the HRSG unit, the applicant must submit to EPA and the Department the following notifications in writing:

- a) The date of construction or installation, postmarked no later than 30 days after such date;
- b) The anticipated date of initial start-up of an affected facility postmarked not more than 60 days, nor less than 30 days prior to such a date;
- c) The date of actual source start-up postmarked with 15 days of such a date.

The applicant must maintain records of the occurrence and duration of any start-up, shutdown, or equipment malfunction in the operation of the affected facility, and maintain these records for no less than two years. However, Permit Condition 13 of the proposed permit will require UNOCAL to maintain permit records for no less than five years. Permit Condition 30 incorporates NSPS Subpart A by reference.

Subpart D:

The HRSG unit (Source B-707) is subject to 40 CFR 60, Subpart D. An affected facility is a fossil-fuel-fired steam-generating unit with a heat input rate of more than 250 mm BTU/hr., which was constructed or modified after August 17, 1971. Source B-707 has not been purchased, but bid requirements were written to ensure that the purchased unit would meet the NSPS standards.

Source B-707 is subject to the particulate matter requirement of Subpart D listed in 40 CFR 60.42(a)(1), which limits particulate matter emissions to 0.10 lb/mm BTU heat input. The HRSG unit is subject to the performance monitoring requirements listed in 40 CFR 60.45 and Condition 31.5, and testing methods listed in 40 CFR 60.46 and Condition 31.6 of this permit.

Source B-707 is subject to the nitrogen oxide (NO₂) limit of 0.20 lb/mm BTU heat input requirement of Subpart D as listed in 40 CFR 60.44(a)(1). The unit is subject to the monitoring requirements listed in 40 CFR 60.45 and Condition 31.5. If initial performance tests under 40 CFR 60.8 show that NO_x emissions are less than 70% of the 0.20 lb/mm BTU limit, NO_x monitoring systems do not need to be installed. If NO_x emissions are 70% or greater of the standard, a continuous NO_x monitoring system (CEMS) will need to be installed within one year of the initial test. This requirement is listed in Condition 31.5.1 and supercedes Condition 30.7.1 if the emissions are 70% or greater of the standard.

Source B-707 is subject to the opacity limit of 20 percent, except for one six-minute period per hour of not more than 27 percent requirement of Subpart D as listed in 40 CFR 60.42(a)(2). Source B-707 will burn only natural gas and will not be required to monitor opacity and SO₂.

Permit Condition 31 incorporates NSPS Subpart D by reference.

Subpart Db:

The HRSG unit (Source B-707) is subject to 40 CFR 60, Subpart Db. An affected facility is a steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity of greater than 100 mm BTU/hr. Source B-707

is subject to the NO_x emission limit of 0.20 lb/mm BTU heat input listed in 40 CFR 60.44b(a)(4)(i). The NO_x standard applies at all times including startup, shutdown, or malfunction, as required in 40 CFR 60.44b(h). Because Source B-707 is an HRSG unit, it is not subject to the performance test and continuous monitoring requirements listed in 40 CFR 60.46b(e) and 40 CFR 60.48b, based on a waiver received from the U.S. Environmental Protection Agency Region 10 on May 10, 1999. To ensure continuing performance with the NSPS NO_x standard, the Department has imposed periodic NO_x performance tests of Source B-707 to be conducted no less than once every twelve months, as set out in Conditions 14 and 32.3.2.

Permit Condition 32 incorporates NSPS Subpart Db by reference.

Subpart GG:

The GE Frame 6B Turbine is an affected facility as classified in 40 CFR 60.330, Subpart GG, Standards of Performance for Stationary Gas Turbines. The turbine was constructed after October 3, 1977, and has heat input rating greater than 10.7 gigajoules per hour based on lower heating value of the fuel. NSPS standards impose additional emission limits on the affected facility's SO₂ and NO_x emissions. Condition 33 of the preliminary permit incorporates relevant portions of Subpart GG by reference.

1. Standards for Nitrogen Oxides – Source No. GGT-1746

The GE Frame 6B turbine, Source No. GGT-1746, is subject to 40 CFR 60.332(a)(1) because it is classified under 40 CFR 60.332(b) as an affected facility with heat input loads greater than 100 MMBtu/hr (100.7 gigajoules/hr), and is an electric utility stationary gas turbine.

The NSPS NO_x standard under 40 CFR 60.332(a)(2) states that no owner or operator shall cause to be discharged into the atmosphere from any stationary gas turbine, any gases which contain nitrogen oxides in excess of

$$\text{STD} = 0.0075 * \frac{14.4}{Y} + F$$

Where: STD = allowable NO_x emissions, percent by volume at 15% oxygen and on a dry basis

Y = manufacturer's rated heat rate at manufacturer's rated peak load, kilojoules per watt hour

F = NO_x emission allowance for fuel-bound nitrogen, percent by volume, assumed to be 0 based on EPA recommendation

2. Standards for Sulfur Dioxide – Source No. GGT-1746

Turbine No. GGT-1746 is subject to the SO₂ standards as stated in 40 CFR 60.333. The owner or operator shall not discharge gases into the atmosphere from a stationary gas turbine with SO₂ in excess of 0.015% by volume (150 ppmvd) at 15% O₂ and on a dry basis, or no owner or operator shall burn fuel with greater than 0.8% sulfur by weight.

The Permittee proposes to comply with this requirement by burning natural gas fuel with a hydrogen sulfide content less than 40 ppm. The fuel limit is well under the sulfur standard of 0.8% sulfur by weight. Permit Condition 33.3 incorporates the applicant's requested fuel sulfur limit with NSPS monitoring, reporting, and testing requirements.

3. Record Keeping and Reporting

The Permittee shall maintain records of all sulfur monitoring data for five years as set out in Condition 13. The applicant shall maintain records documenting the fuel supplier or source. A substantive change in fuel quality shall be considered as a change in fuel supply. The Department has incorporated the record keeping and reporting requirements in Permit Condition 33.4.

4. Test Methods and Procedures

The Permittee shall determine compliance with the sulfur dioxide standard per 40 CFR 60.335(d). The Permittee shall use methods described in this section—ASTM D 1072-80, D3031-81, D4084-82, or D3246-81, or EPA-approved alternative. On January 14, 1998, EPA approved the length-of-stain detector tube protocol covered by ASTM Method D 4810-88 to be used to monitor fuel sulfur for the GE Frame 6B Turbine at the AEG&T Soldotna Plant. The waiver also allows AEG&T to not monitor fuel nitrogen content for the GE Frame 6B Turbine as long as 100% pipeline-quality natural gas is the only fuel being fired. The EPA-approved waiver for fuel sulfur and fuel nitrogen monitoring will transfer to the UNOCAL Kenai Plant Co-Gen Project when the GE Frame 6B Turbine is relocated. The applicant may use fuel analysis performed by owner/operator, service contractor, fuel vendor, or other qualified agency pursuant to 60.335(f).

Permit Conditions 14 and 33.5 of the proposed permit incorporate Federal test methods by reference.

Permit Condition 32.4 of the proposed permits requires that NO_x performance tests be conducted on the HRSG unit no less than once every 12 months as set out in Conditions 14 and 32.3.2. The HRSG must be tested at the same monitoring interval as the Frame 6B Turbine because the input and output exhaust of the turbine and the HRSG unit must be monitored to identify the contribution of each unit to the combined exhaust of the units to ascertain compliance.

Air Pollution Prohibited

The air quality protection standards in 18 AAC 50 – Air Quality Control, include a prohibition on Air Pollution. The prohibition, 18 AAC 50.110, states “No person may permit any emission

which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.”

The scope of work covered by this permit is limited to the Co-Gen project. All the equipment except the Detroit Diesel start-up engine will burn only natural gas, so the equipment should not produce emissions in excess of applicable standards.

In order to ensure compliance with the prohibition, the Department is proposing monitoring, testing, record keeping, and reporting requirements regarding public complaints about the applicant’s Co-Gen system. They are listed in Condition 38. The applicant must also report any proposed changes to the Co-Gen system that might result in increased potential air contaminant emissions. These requirements are listed in Condition 38.1.3.

PERMIT ADMINISTRATION

The Department has prepared an Air Quality Control Construction Permit for UNOCAL, Kenai Fertilizer Plant, LLC, for the installation and operation of the Co-Gen system at the Kenai Chemical Plant, Kenai, Alaska. The preliminary permit will allow UNOCAL to construct and operate a Co-Gen system at the Kenai Plant. The decision documents have been prepared in accordance with the provisions of 18 AAC 50.315.

Standard Conditions

Conditions 1 and 2 incorporate the permit continuity clause in 18 AAC 50.340(i). The Department has also incorporated standard permit Conditions 3-11 from the Operating Permit Program, through the State’s authority of AS 46.14.120(d), to ensure consistency with the operating permit obligations.

All facilities permitted under 18 AAC 50 - Air Quality Control regulations, are under the purview of the Department’s Air Permits Program. The Program’s Inspection Services Group has oversight for all reports, surveillance, records, and inspections of permitted facilities. Therefore, all plans, reports, and notices required under this Permit should be submitted to the Group’s Fairbanks Office, as provided for in Condition 12 of the permit.

Condition 13 incorporates the record keeping obligations of 18 AAC 50.350(h)(5). Condition 14 authorizes changes in monitoring without a permit revision. Conditions 12 and 16.1 set out reasonable excess emission reporting under AS 46.14.120(d). The Department recognizes Conditions 14 and 16 as standardized conditions and has endorsed development of standard conditions through the Administrative Procedures Act, AS 44.62. The Construction Permit staff has forwarded these conditions for inclusion in a regulation packet to develop standard permit terms for construction permits.

Project Consistency with Alaska Coastal Management Program

The applicant submitted a coastal project questionnaire with their application. The questionnaire identifies the need for Alyeska to apply only for an Air Quality Control Construction Permit. Therefore, under 6 AAC 50.030, the Alaska Department of Environmental Conservation is conducting the project consistency under the Alaska Coastal Management Program, subject to terms and conditions listed in Construction Permit No. 9923-AC004.

The Department proposes to find UNOCAL's Co-Gen system at the Kenai Plant consistent with the Alaska Coastal Management Program, subject to the terms and conditions listed in the Construction Permit.

Preliminary Decision

The permit application and follow-up documents for an Air Quality Control Permit satisfy the requirements in 18 AAC 50.310. UNOCAL's application demonstrates the Co-Gen system will meet the applicable requirements described in 18 AAC 50.315(e). Therefore, in accordance with 18 AAC 50.315(b)-(c), the Department has prepared a preliminary decision and published a public notice announcing a 34-day public comment period starting July 28, 1999.

APPENDIX A

Coastal Project Questionnaire and Application Forms

APPENDIX B**Demonstration of Compliance with 18 AAC 50.055(b)
Particulate Loading of 0.05 gr/dscf**Sources: Gas-Fired Turbine—GE Frame 6B Turbine (Source GGT-1746)

From AP-42, Table 3.1-1, PM emission factor = 0.042 lb/MMBtu

From 40 CFR 60, Method 19

$$E = CF[20.9/(20.9-O_2)]$$

$$E = \text{pollutant emission rate (lb/MMBtu)} = 0.042 \text{ lb/MMBtu}$$

$$C = \text{pollutant concentration in stack gas (lb/scf)}$$

$$F = \text{F-Factor (scf/MMBtu)} = 8710 \text{ scf/MMBtu}$$

$$O_2 = \% \text{ Oxygen in stack gas} = 15\%$$

Solving for C, converting to gr/scf

$$C = 0.042/8710/[20.9/(20.9-15)] = 1.4 \text{ E-6 lb/scf}$$

$$\underline{\underline{C = 0.01 \text{ gr/scf}}}$$

Sources: Gas-Fired Engine—HRSG (Source B-707)

From AP-42, Table 3.2-3, PM emission factor = 0.0007 lb/MMBtu

From 40 CFR 60, Method 19

$$E = CF[20.9/(20.9-O_2)]$$

$$E = \text{pollutant emission rate (lb/MMBtu)} = 0.0007 \text{ lb/MMBtu}$$

$$C = \text{pollutant concentration in stack gas (lb/scf)}$$

$$F = \text{F-Factor (scf/MMBtu)} = 8710 \text{ scf/MMBtu}$$

$$O_2 = \% \text{ Oxygen in stack gas} = 0\%$$

Solving for C, converting to gr/scf

$$C = 0.0007/8710/[20.9/(20.9-0)] = 8.0 \text{ E-8 lb/scf}$$

$$\underline{\underline{C = 0.00056 \text{ gr/scf}}}$$

Sources: Gas-Fired Heaters (Sources 10-15, and 18)

From AP-42, Table 1.4-2, PM emission factor = 7.6 lb/MMscf

From 40 CFR 60, Method 19

$$E = CF[20.9/(20.9-O_2)]$$

$$E = \text{pollutant emission rate (lb/MMBtu)} = 0.0075 \text{ lb/MMBtu}$$

$$C = \text{pollutant concentration in stack gas (lb/scf)}$$

$$F = \text{F-Factor (scf/MMBtu)} = 8710 \text{ scf/MMBtu}$$

$$O_2 = \% \text{ Oxygen in stack gas} = 0\%$$

Solving for C, converting to gr/scf

$$C = 0.0075/8710/[20.9/(20.9-0)] = 8.6 \text{ E-7 lb/scf}$$

$$\underline{\underline{C = 0.006 \text{ gr/scf}}}$$

Sources: Large Diesel-Fired Engine—Detroit Diesel Startup Engine (Source GSE-1746)

From AP-42, Table 3.4-1, PM emission factor = 0.1 lb/MMBtu

From 40 CFR 60, Method 19

$$E = CF[20.9/(20.9-O_2)]$$

$$E = \text{pollutant emission rate (lb/MMBtu)} = 0.1 \text{ lb/MMBtu}$$

$$C = \text{pollutant concentration in stack gas (lb/scf)}$$

$$F = \text{F-Factor (scf/MMBtu)} = 9190 \text{ scf/MMBtu}$$

$$O_2 = \% \text{ Oxygen in stack gas} = 9\%$$

Solving for C, converting to gr/scf

$$C = 0.1/9190/[20.9/(20.9-9)] = 6.2 \text{ E-6 lb/scf}$$

$$\underline{\underline{C = 0.043 \text{ gr/scf}}}$$

**Demonstration of Compliance with 18 AAC 50.055(c)
500 ppm Sulfur Compound Emissions**

Sources: Natural Gas-Fired Equipment

From 40 CFR 60, Method 19

F-Factor for Natural Gas = 8170 scf stack gas/106 Btu fuel

1 ppm SO₂ = 1.660E-7 lb SO₂/scf (conversion factor)

Converting ppm SO₂ in stack gas to ppmv S (as H₂S) in fuel

$$\begin{aligned} 500 \text{ ppmv SO}_2 &= 500 \text{ scf SO}_2/10^6 \text{ scf stack gas} \\ (500 \text{ scf SO}_2/10^6 \text{ scf})(8170 \text{ scf}/106 \text{ Btu fuel})(1000 \text{ Btu fuel}/\text{scf fuel}) \\ &= 4.335\text{E-}3 \text{ scf SO}_2/\text{scf fuel} \end{aligned}$$

$$\begin{aligned} (4.335\text{E-}3 \text{ scf SO}_2/\text{scf fuel})(\text{mole SO}_2/379 \text{ scf SO}_2)(\text{mole H}_2\text{S}/\text{mole SO}_2) \\ = 1.15\text{E-}5 \text{ mole H}_2\text{S}/\text{scf fuel} \end{aligned}$$

$$\begin{aligned} (1.15\text{E-}5 \text{ mole H}_2\text{S}/\text{scf fuel})(379 \text{ scf H}_2\text{S}/\text{mole H}_2\text{S}) \\ = 4.335\text{E-}3 \text{ scf H}_2\text{S}/\text{scf fuel} \end{aligned}$$

$$\begin{aligned} (4.335\text{E-}3 \text{ scf SO}_2/\text{scf fuel})(10\text{E}6) \\ = 4,355 \text{ ppmv} \end{aligned}$$

Therefore, if fuel H₂S is less than 4,355 ppmv, resulting SO₂ stack gas concentration is less than 500 ppm.

Assumptions and Comments:

Calculation conservatively assumes that no excess air is present in stack gas, even though natural gas-fired equipment is operated with excess air (measured as O₂) in the stack gas as a requirement for good combustion.

Molecular weight of fuel is equal to molecular weight of methane.

Btu content of fuel is assumed equal to 1000 Btu/scf (conservative assumption).

**Demonstration of Compliance with 18 AAC 50.055(c)
500 ppm Sulfur Compound Emissions**

Sources: Fuel Oil-Fired Equipment

From 40 CFR 60, Method 19

F-Factor for Fuel Oil = 9190 scf stack gas/10⁶ Btu fuel

1 ppm SO₂ = 1.660E-7 lb SO₂/scf (conversion factor)

Converting ppm SO₂ in stack gas to weight % S in fuel

$$(500 \text{ ppmv SO}_2)(1.660\text{E-}7 \text{ lb SO}_2/\text{scf}) \\ = 8.3\text{E-}5 \text{ lb SO}_2/\text{scf}$$

$$(8.3\text{E-}5 \text{ lb SO}_2/\text{scf})(9190 \text{ scf stack gas}/10^6 \text{ Btu fuel})(0.0193 \text{ MMBtu}/\text{lb fuel}) \\ = 1.48\text{E-}2 \text{ lb SO}_2/\text{lb fuel}$$

$$(1.48\text{E-}2 \text{ lb SO}_2/\text{lb fuel})(\text{mole SO}_2/64 \text{ lb SO}_2)(\text{mole S}/\text{mole SO}_2)(32 \text{ lb S}/\text{mole S}) \\ = 0.0074 \text{ lb S}/\text{lb fuel}$$

$$=0.74 \text{ wt } \% \text{ S}$$

Therefore, if fuel sulfur is less than 0.74% wt %, resulting SO₂ stack concentration is less than 500 ppm.

Assumptions and Comments:

Calculation conservatively assumes that no excess air is present in stack gas, even though fuel oil-fired equipment is operated with excess air (measured as O₂) in the stack gas as a requirement for good combustion.

Attachment 2

Permit No. 9923-AC004 Revision 1 TAR

**(Inserted as Word document, formatting and page numbers may be
different from original)**

TECHNICAL ANALYSIS DOCUMENT

Agrium U.S., Inc.
Kenai Nitrogen Operations
Co-Generation Project
Revision 1

This report contains the technical and regulatory basis for Applicable Requirements under Alaska Air Quality Control Regulations 18 AAC 50

Final Decision Document

July 14, 2003

Prepared by Sally A. Ryan, P. E.

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Air Quality Maintenance Section
Construction Permits
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INTRODUCTION

Agrium U.S., Inc., operates an ammonia and urea manufacturing plant located in Kenai, Alaska. The plant's most recent operating permit is Air Quality Control Permit-to-Operate No. 9423-AA011. A Title V permit application has been submitted and determined to be complete, and a Title V permit is pending. Therefore, the Kenai Plant presently operates under the shield created by submitting a complete operating permit application under AS 46.14.275.

The most recent construction permit is Construction Permit No. 9923-AC004. The Department of Environmental Conservation (ADEC) received a request to revise this construction permit dated March 26, 2003. The revisions include general housekeeping changes, deletion of one-time requirements that are now complete, and changes in permit conditions to reflect recent rulemaking.

The requested changes and ADEC's responses are listed in Appendix A. The final revision 1 to the permit reflects ADEC's responses as indicated in Appendix A.

ADEC has determined that the proposed modifications will not cause additional impacts to the coastal use or resource and therefore do not require a consistency review under Alaska Coastal Management Program provisions of 6 AAC 50.810.

FINAL DECISION

ADEC has made a final decision to issue the construction permit under the authority of AS 46.14 and 18 AAC 50.

The terms and condition of the construction permit do not preclude any action by the state, EPA, or the Federal Land Manager to mitigate any material violation of the permit, or the mitigation of any secondary effect from the emissions of the facility.

APPENDIX A

ADEC Responses to March 26, 2003 Requested Changes

Condition Number	Requested Change	Response to Requested Change	Reason for Response
Cover Page	Owner and Operator: Alaska Nitrogen Products, LLC	Acceptable.	Update facility information.
14.5	Allow 60 days to submit source test results.	Acceptable.	Conforms with 5/3/02 revisions to 18 AAC 50.345(o) – Construction and Operating Permits: Standard Permit Conditions.
18	Agrium requests that only the (800) 478-9300 number be listed.	Update conditions 18 and 19 on with the new (adopted 5/3/02) standard condition on excess emission reporting. Also update condition 38 with the new standard condition on Air Pollution Prohibited and include the new standard condition for ADEC's Notification Form as Exhibit D ⁵	Continuity.
22.1	Remove.	Acceptable.	This condition has been satisfied (letter from Steve Maltby, Agrium, to Dan Meyer, EPA, dated 5/15/01). There are no further obligations incumbent on the permittee regarding this condition.

⁵ The new standard condition for excess emissions reporting includes cross-reference to the new standard conditions for Air Pollution Prohibited and the ADEC Notification form.

24 (including 24.1-3)	Remove.	Acceptable.	The Fairbanks Morse Generators have been decommissioned (ADEC Inspection Report dated 12/11/01, and letter from Steve Maltby, Agrium, to Tim Pilon, ADEC, dated 1/29/02). Additionally, reports demonstrate that the 40 ton per year (tpy) threshold was not exceeded during the commissioning phase. The greatest increase was 7.6 tons per 12-month period.
25	Correct condition number to cross-reference condition 20.1 rather than condition 21.	Acceptable.	Typographical error.
28.1	Remove.	Acceptable.	Tim Pilon, ADEC, verified that this condition has been satisfied during an inspection conducted on 12/11/01. Completion of the requirements of this condition was again documented in a letter from Agrum to Tim Pilon, ADEC, dated 1/129/02. There are no further obligations incumbent on the permittee regarding this condition.
29.1	Remove.	Acceptable.	Decommissioning activities were completed on 12/31/01 so this condition has been satisfied (letter from Steve Maltby, Agrium, to Tim Pilon, ADEC, dated 1/29/02). There are no further obligations incumbent on the permittee regarding this condition.
30.7.2 and 30.7.3	Remove.	Acceptable.	Condition 31.5.1.1 states that no continuous emissions monitoring system (CEMS) is required if initial performance tests are less than 0.14 lb NO _x /MMBtu. Results of initial tests indicate a maximum NO _x rate of 0.12 lb/MMBtu (Source Test dated May 2001).

31 (including 31.1-6)	Remove.	Acceptable.	The New Source Performance Standards (NSPS) 40 C.F.R. 60, Subpart D provisions no longer apply to turbine duct burners, per revision October 2001. In 18 AAC 50.040(c). ADEC has incorporated by reference provisions of NSPS 40 C.F.R. 60, Subpart D as revised as of July 1, 2001. Therefore ADEC has not yet incorporated the revision to Subpart D.
34	Change to an average over any six consecutive minutes.	Update this condition to contain the old three-minute aggregate standard and the new six-minute average standard, as listed in new standard condition for visible emissions, and add footnote regarding the old standard sunset timeframe.	ADEC's authority to enforce the Clean Air Act is based on the approved State Implementation Plan, which contains the old three-minute standard. The new six-minute standard has been adopted by ADEC so it must also be included. However the old three-minute standard is still federally enforceable until EPA approves ADEC's new regulations.
39, 39.1, and 39.2	Remove.	Acceptable.	These conditions have been satisfied (letter from Jeff Anderson, ADEC, dated 3/20/01). Therefore they no longer apply.
Exhibit A – condition 1	Remove requirement for CEMS reporting.	Acceptable.	The Heat Recovery Steam Generator system does not require a CEMS.
Exhibit A – condition 3	Add language at the end, "per Consent Decree, case No. A97397CIV."	Acceptable.	Clarity.

Exhibit A – condition 5	Remove.	Keep the condition as is, and add in the requirement for a continuous monitoring system (CMS) in accordance with 40 C.F.R. 60.334(a)	GGT-1746 was required to use water injection in Permit No. 8923-AA004 for the Alaska Electric Generating and Transmission Soldotna #1 substation, in order to meet the NSPS NO _x limit (and BACT limit). Permit No. 8923-AA004 contained operational limits and water injection rates for natural gas- and distillate fuel-firing for the purpose of meeting the NSPS limit. The turbine was relocated to Agrium KNO in 1999 and is still is required to use water injection to meet NSPS NO _x limit. The turbine is now prohibited from burning distillate fuel under condition 25. 40 C.F.R. 60.334(a) requires any turbine subject to Subpart GG and using water injection to meet the NO _x limit must install and operate a CMS to monitor and record the ratio of water to fuel being fired in the turbine. For this reason, the continuous monitoring system performance reports are still necessary as required in Condition 30.3 and Exhibit A, condition 5.
Exhibit A – condition 7	Drop references to conditions 31.5.4 and 32.5.7 and mention that this condition refers to source B-707.	Accept the change with the exception that condition 32.5.7 be kept.	ADEC has approved the removal of condition 31. Therefore cross-references to it must be dropped. Keeping condition 32.5.7 provides an alternative reporting scenario. Reference to source B-707 adds clarity.
Exhibit B – condition 2	Replace with, “Condition 14.2, 14.3, 14.4, 14.5, 30.4.1, 30.4.5, and 37.2...”	Replace with, “Condition 14.1 , 14.2, 14.3, 14.4, 14.5, 14.6 , 30.4.1, 30.4.5, and 37.2...”	Correct typos.
Exhibit B – condition 6	Remove.	Acceptable.	Condition satisfied with no further obligations.