



## **Equator Principles Review of the Santa Luiza PCH Project, Santa Catarina, Brazil**

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## **INTRODUCTION**

### **1.1 BACKGROUND**

Conduit Capital (Conduit) has been awarded a concession consisting of 23 small hydroelectric power plant projects (*Pequenas Centrais Hidrelétricas* or PCHs) projects in Brazil (see Section 1.3 below for more detail on the program). Conduit has retained ERM to provide Equator Principle (EP) based social and environmental due diligence of these projects on an individual basis.

The current report presents the results of the environmental and social due diligence site visit for the Santa Luzia Alto hydroelectric power plant (PCH Santa Luzia Alto or the Project), which was conducted during the week of October 27-31, 2008.

### **1.2 REPORT ORGANIZATION**

This report is organized in six sections and two annexes as follows:

- Section 1, Introduction;
- Section 2, Project Description;
- Section 3, Brazilian Regulatory Framework;
- Section 4, Main Findings;
- Section 5, Conclusions;
- Section 6, Recommendations;
- Annex A, Location Maps; and
- Annex B, Photo Log.

### **1.3 EVALUATION FRAMEWORK**

The social and environmental assessment policy references for the EPs are the IFC's Performance Standards on Social and Environmental Sustainability (PSs). Therefore, the environmental and social due diligence of the PCH Santa Luzia Alto was based on this framework.

The PSs also require compliance with applicable host country regulatory framework.

### **1.4 BRAZILIAN REGULATORY FRAMEWORK FOR PCH PROJECTS**

#### **1.4.1 Energy Sector Regulatory Framework**

Hydroelectric power provides nearly 90% of the Brazil's national electricity production. Brazil's National Electric Energy Agency (ANEEL) is the agency that regulates electrical generation in Brazil. The agency recognizes small hydroelectric plants (*Pequenas Centrais Hidrelétricas* or PCHs) as a special category of facilities, and there is significant promotion of international investment in this sector.

There are three ANEEL resolutions that regulate PCH projects. These include:

1. ANEEL Resolution N° 393 of December 4, 1998, which establishes the general procedures for registration and approvals of initial studies for evaluation of the hydroelectric potential of basins. Developers that want to study a basin must first obtain an approval from ANEEL.
2. ANEEL Resolution N° 395 of December 4, 1998, which defines the general procedures for registration and approval of feasibility studies and initial project design for PCHs. This resolution also includes provisions for issuance of the area as public utility, which allows for expropriation of properties when needed.
3. ANEEL Resolution N° 652 of December 9, 2003, which replaced ANEEL Resolution N° 394, describes the general characteristics of PCHs. Under ANEEL Resolution N° 652, a PCH is characterized by:
  - Installed capacity of 1 to 30 megawatt (MW);
  - Total area of reservoirs can be up to 3 square kilometer (km<sup>2</sup>) but  $\leq 13$  km<sup>2</sup> per the following equation:

$$\text{Area} \leq 14.3 * \text{Installed Capacity (MW)} / \text{hydraulic head (m)}$$

ANEEL did not specify a limit for dam height as a criterion for PCHs. There is no maximum dam height because Resolution N° 652 replaced previous resolutions and the intent was to expedite and incentivize power generation in alignment with national priorities following energy shortages that Brazil suffered during the mid to late 1990s.

National Water Agency (ANA) Resolution No. 131 of March 11, 2003 defines the procedures for the request of the water rights for hydroelectric projects with capacities above 1.0 MW. Article 11 of this resolution states that projects already under consideration by ANEEL as of March 11, 2003 are exempt.

After passing through initial feasibility studies, the proponent must register a Basic Engineering Project with ANEEL and then obtain environmental licenses and authorization from federal or state agencies.

Power purchase agreements (PPA) through ANEEL's Auction were signed in September 2008 and are valid for 30 years, beginning January 1, 2010 until December 31, 2039.

Through this auction, the Project has committed to sell 14.0 MW. It is estimated for the first six months, until fully operational, that the Project will purchase electricity from the national grid to fulfill its PPA commitments. PCH Santa Luzia has also signed a PPA with the supermarket chain Carrefour to sell 4 MW through the free electricity market.

## 1.4.2 *Environmental Regulatory Framework*

Brazilian laws require that environmental regulations be enacted at all levels of the government – federal, state, and municipal.

The National Council of Environment (CONAMA) establishes general guidelines to be followed throughout the country. State and municipal agencies can impose more restrictive standards.

Per CONAMA Resolution No. 001/86, the environmental permitting process for potentially polluting projects requires the preparation of an environmental impact assessment (EIA) and the Summary of Environmental Impact Assessment (Relatório de Impacto Ambiental [RIMA]) for the issuance of three licenses, which include:

1. Preliminary License (Licença Prévia [LP]) - The LP can only be issued after the public has access to a copy of the RIMA and a public hearing is held in accordance with good public involvement practices. The LP is only a statement that the proposed project is environmentally feasible. It does not allow for any site preparation or related construction activity.
2. Installation License (Licença de Instalação [LI]) - The LI, which allows for commencement of construction activities, is usually issued after the regulatory agency has reviewed and approved a project-specific Environmental and Social Management Plan (ESMP) (Projeto Básico Ambiental). The ESMP, or equivalent plan, provides site-specific mitigation measures, procedures, and actions to be adopted during the construction phase, which aim at preventing or minimizing impacts to the environment. The LI also establishes specific requirements regarding the mitigation and monitoring of environmental and social impacts and compensations.
3. Operating License (Licença de Operação [LO]) - The LO must be obtained prior to project operation and establishes conditions for the operation of the facility. For hydroelectric projects, the LO must be obtained prior to the filling of the reservoir.

CONAMA Resolution 06/87, establishes the requirements for the permitting process of large projects, including power plants with nominal capacity above 10 MW.

CONAMA Resolution 002/96 determines that projects with significant environmental impacts shall provide funds to establish, manage, or protect environmental conservation areas/units. The funds for this environmental compensation should be a minimum of 0.5 percent of the total project cost.

CONAMA Resolution 237/1997 defines the appropriate jurisdiction for the environmental permit. IBAMA (National Institute of Environment and Natural Resources) leads the environmental permitting process when the project is located at the border of two or more states, at international borders, at federal rivers, continental shelf, exclusive economic zone, national protected areas, and indigenous lands. Most projects, however, are licensed by state agencies with input from municipalities.

In the State of Santa Catarina, the Secretariat of Environment and Sustainable Development (SDS), through the technical evaluation by the State Foundation of Environment (FATMA), review the environmental documents and issue the environmental licenses.

In addition to obtaining environmental licenses (LP, LI and LO), the developer must also obtain all other environmental authorizations and licenses for the following resources:

- Cultural Resources: Authorizations for performance of cultural surveys, recovery and preservation of artifacts must be obtained from the National Institute of Historic and Artistic Heritage (IPHAN).
- Vegetation Suppression: Authorization for vegetation suppression as part of site preparation and for the reservoir area must be obtained from the state environmental agency. This license may also provide authorization for transport, commercialization and disposal of vegetation.
- Animal rescue and relocation– Regional IBAMA offices issue an authorization for rescue and relocation of animals that may be encountered during vegetation suppression.
- Fish rescue and relocation – The state agency issues an authorization for rescue and relocation of fish during the construction and the filling of the reservoir.
- Creation of an area of permanent protection around the reservoir. For the Project, the APP consists of a 30-meter wide area that is measured from the edge of the reservoir maximum operational water level.
- Water Supply – If the project owns and operates water supply wells and cisterns, the developer must obtain a license from the Secretariat of Environment and Sustainable Development (SDS) - Division of Water Resources, for the operation of the well. In addition, if the water is used for drinking purposes, the developer must monitor the water quality in accordance with the Brazilian Ministry of Health Ordinance No. 518 of 2004.
- Use of explosives: The Army issues the authorization for the storage, handling and transportation of explosives needed for the rock quarry and construction of the tunnel.

## **PROJECT DESCRIPTION**

### **2.1 GENERAL CHARACTERISTICS**

The 28.5-MW Santa Luzia Alto Small Hydroelectric Power Plant is under construction on the Chapecó River in the municipalities of São Domingos and Ipuacú in Santa Catarina state in southern Brazil. The Project is located between PCH Ludesa, upstream, and UHE Quebra Queixo, downstream. The location of the Project is illustrated in Figure 1..

The Project is being developed by SPE Santa Luzia Energética S.A. (the Sponsor), which is owned by GLEP, a holding company consisting of Conduit Capital and Construtora Gomes Lourenço Ltda.

The reservoir will have a surface area of 8.8 km<sup>2</sup> and total storage capacity of 105,00 cubic hectometers (hm<sup>3</sup>) or 105,000,000 m<sup>3</sup>. The dam will have a height of 36 meters above the foundation and a maximum width of 447.5 m.

Other major components include:

- A 202-m intake channel,
- A 285-m intake tunnel, 2.4 m in diameter, that branches into three 2.8-meter diameter tunnels,
- 3 turbine-generator units,
- A 138-kV substation, and
- A 6-km 139-kV transmission line that will connect to the Ludesa Substation, which is connected to the national grid.

### **2.2 PROJECT SCHEDULE AND COSTS**

The Project started construction in October 2008 and is currently expected to start filling the reservoir in March 2010. As per the latest Project schedule approved by ANEEL, the Project has the following schedule commitments:

- First Unit - start testing/commissioning by April 15, 2009 and operation by May 26, 2009;
- Second Unit - start testing/commissioning by May 27, 2009 and operation by July 7, 2009, and
- Third Unit - start testing/commissioning by July 22, 2009 and operation by September 1, 2009.

As noted above, the Sponsor anticipates that 18 MW will be purchased from the national grid to fulfill PPA conditions for the period January through June 2010 when the project is expected to generate at full capacity.

The project cost is estimated at R\$ 141,300,000.

## 2.3 *CURRENT PROJECT STATUS*

Construction activities at the site started on October 14, 2008, approximately two weeks prior to the site visit. The EPC Contractor, Construtora Gomes Lourenço, is utilizing existing construction camp facilities developed by Construtora Gomes Lourenço during the construction of the PCH Ludesá. This facility is located within the Town of São Domingos, along State Highway SC - 480, in an area of mixed industrial and residential land use. The facility includes:

- Administration buildings;
- Lodging;
- Warehouse;
- Carpentry shop;
- Vehicle maintenance shop;
- First-aid room;
- Cafeteria;
- Restrooms;
- Concrete facility/basins;
- Septic tank and drainage field system;
- Gravel yard;
- Waste Storage Area;
- Chemical Storage Area;

The use of this existing facility is a good environmental and economic solution since the complex already has good infrastructure, including municipal water supply, electricity, internet access and all the other supporting services.

The Project site is accessible via a combination of state and municipal roads, approximately 10 km from the location of the staging area along SC-480. In the future, when the Sponsor finalizes the negotiation with two property owners, a new access road will be constructed which will provide direct access from the camp facility to the Chapecó River, a distance of approximately 2 to 3 km. Near the Chapecó River, a second smaller construction camp and staging area is under construction to lodge approximately 120 workers. At this location, a groundwater water supply well will be drilled to provide water for the camp and a similar septic tank drainage field system will be installed for sanitary wastes.

At the time of the site visit, there were approximately 85 workers at the site, with 12 living in the onsite lodging along SC-480. Workers were transported to the Project site by bus and vans provided by the Construtora Gomes Lourenço.

At the time of the site visit, construction activities focused on the construction of the new staging area near the Chapecó River and on the power house.

## 2.4 *ENVIRONMENTAL, HEALTH, AND SAFETY MANAGEMENT SYSTEM*

The Project has prepared an environmental management plan (PBA)<sup>1</sup> for the construction of the Project. The PBA includes description of procedures and

(1) <sup>1</sup> In Santa Catarina State, the EMP is termed as "PBA", whereas in the rest of Brazil the term "PCA" is used.

measures to be implemented during the construction in compliance with the conditions of the LI.

The Projects and programs included in the PBA are:

1. Environmental Management of the Construction Site;
2. Program to Ensure Project will Favor Local Workforce;
3. Program for Compensation of Directly Affected Population;
4. Program of Environmental Education and Social Communication;
5. Monitoring Program for limnology and water quality;
6. Monitoring Program for Sedimentation of Reservoir;
7. Program for the Protection of the Margins of the Reservoir and Restoration of Degraded Areas;
8. Vegetation Clearing in the Area of the Reservoir;
9. Program for Management and Conservation of Flora;
10. Program for the Implementation of the Riparian Vegetation around the Reservoir;
11. Program to Promote Implementation of the Conservation Areas (20% of the Total Property) in the Properties Surrounding Reservoir;
12. Program of Rescue and Protection of Fauna during vegetation clearing for the filling of the reservoir;
13. Ichthyofauna Program;
  - a. Monitoring Project before damming;
  - b. Monitoring Project post-filling of the reservoir;
  - c. Rescue of ichthyofauna during the detouring of the river and the filling of the reservoir;
  - d. Project to evaluate the need for intervention in the area of reduced river flow to prevent trapping fish in isolated pools;
  - e. Project for the relocation of above fish;
14. Master Plan for the Conservation, Use, and Land Use for the Area Surrounding the Reservoir.

The Project has also prepared health and safety documents as required by Brazilian regulations. These include:

- Program for Environmental and Occupational Conditions in the Civil Construction Industry (Programa de Condições e Meio Ambiente de Trabalho na Indústria da Construção Civil);
- Medical Surveillance Program (Programa de Controle Médico e Saúde Ocupacional); and
- Environmental Risks Prevention Program (Programa de Prevenção de Riscos Ambientais).

These documents describe the identification of risks associated with all civil construction activities within the site and provide for mitigation measures.

PCH projects are regulated by a robust and comprehensive assessment and approval process which aligns quite well with the IFC PSs.

### **3.1 ANEEL AUTHORIZATIONS**

On May 23, 2006, ANEEL issued Resolution No. 1.040 which authorized Construtora Gomes Lourenço Ltda. to conduct the Basic Project for the PCH Santa Luzia Alto. On December 7, 2006, ANEEL issued Resolution No. 3.570 in which ANEEL accepted the Basic Project for PCH Santa Luzia Alto. MME (Ministry of Mines and Energy) Ordinance No. 352 of December 20, 2007 declared Construtora Gomes Lourenço the IPP for the Project. On July 1, 2008, ANEEL issued Resolution No. 1.445 to transfer the IPP rights from Construtora Gomes Lourenço to SPE Santa Luzia Energética S.A.

### **3.2 POWER PURCHASE AGREEMENTS**

The Project has signed PPAs through ANEEL's auction process and in the free market. PPAs are valid for 30 years starting on January 1, 2010.

### **3.3 EIA AND ENVIRONMENTAL LICENSES**

The environmental permitting process began with the submittal of a Simplified Environmental Report (RAS) to the State Environmental Agency, FATMA, in August 2006. The submittal of a RAS attempted to follow guidelines from CONAMA Resolution No. 279 of June 27, 2001, that aimed at allowing projects with minor environmental impacts to be permitted via a simplified and expedited permitting process. This regulation commonly applies to transmission lines with capacity below 230 kV and generation facilities with capacity below 10 MW. On November 7, 2006, FATMA granted a Preliminary License (LAP No. 224/06) and on December 20, 2006, FATMA granted the Installation License (LAI No. 0022/06).

However, CONAMA Resolution No. 001, of January 23, 1986, and CONAMA Resolution No. 237, of December 19, 1997, state that an EIA/RIMA is required for energy generation facilities with capacity above 10 MW. Thus, in order to comply with these resolutions, an EIA/RIMA was prepared and submitted to FATMA in August 2007. Following technical review by FATMA, the installation license was revised and LAI No. 0022/08 was issued on September 30, 2008. The Project is being constructed under the conditions stated in this license.

The developer must obtain an LO for the Project prior to the filling of the reservoir, which is currently scheduled for early 2010.

The 6-km 138-kV transmission line that will connect to the Substation at PCH Ludesa is licensed under the Project environmental permitting process. There will be no separate licenses for the transmission line.

### 3.4 *WASTER USE AND SUPPLY AUTHORIZATIONS*

The State of Santa Catarina Secretariat of Sustainable Economic Development (SDS) has granted the authorization for the water use rights for hydroelectric purposes (Portaria N° 041/08 – SDS of August 14, 2008).

The new staging area near the Chapecó River will have water supplied from a groundwater well that will also be used for all purposes, including human consumption. The developer has requested a license for the well; however, this has not yet been granted.

Because the Project developer will own and operate a water supply well that will provide drinking water to workers, drinking water quality must be monitored in accordance with the Ministry of Health Ordinance No. 518 of 2004.

### 3.5 *OTHER LICENSES AND AUTHORIZATIONS*

The Project has secured, or is in the process of securing, the following additional licenses and authorizations:

- LAO 628/08 FATMA – for the onsite concrete facility;
- LAO 629/08 FATMA – for the onsite gravel facility;
- Authorizations from FATMA (AuC 017/2007/GELAR) for cutting, transporting and commercializing lumber/vegetation removed from the site. A request to renew this authorization was submitted in September 2008;
- LAO for the onsite rock quarry;
- Authorization for animal rescue and relocation (ongoing);
- License for rescue and relocation of fish (ongoing);
- IPHAN N° 324, of October 11, 2006 for the archaeological/cultural surveys in the area of the Project; and
- Authorization from the Army for purchasing, transporting and storing explosives (ongoing).

### 3.6 *STAKEHOLDER ENGAGEMENT*

As part of the permitting process, the Sponsor conducted public meetings in October 2006 and in April 2007.

The Project developer has been able to sign agreements with most property owners and residents who live around the future 8.8 km<sup>2</sup> reservoir, but some negotiations are still ongoing. As per information received, there was no resettlement associated with the Project but some homes had to be relocated (i.e. reconstructed) within their property. Construtora Gomes Lourenço will build new homes for the property owners. Property owners and residents were compensated for the portion of land that will be flooded by the reservoir. However, the Sponsor has not been able to negotiate an agreement with the owner of a large property and requested that ANEEL declare the portion of the property affected by the Project to be considered public utility for expropriation.

Under public utility status, the Sponsor will pay the fair market value for the portion of the property directly affected by the Project.

As per information reviewed, the Project seems to be in compliance with in-country regulations.

#### 4.1 GENERAL FINDINGS

PCH projects are subject to the typical sorts of impacts associated with dam and reservoir projects. Some PCH projects may involve dams greater than 15 m in height, which, for comparative purposes, would be considered “large” dams under the 2001 World Bank Operational Policy 4.37, which requires additional reviews of design and safety considerations for dams exceeding 15 m. Such is the case of the PCH Santa Luzia, whose dam will have a total height of 36 m.

Hydroelectric projects can cause real impacts to river systems through the direct effects of impounding water, flooding areas and alteration of downstream hydrology. These are generally long term effects, but are reversible if the decision is ever made to do so. In the specific case of Brazil, there is a national program to maximize energy production from hydro, and the national government and the public appear to favor what is generally considered a renewable form of energy. As a result, the country has a large number of dams on many of the river systems.

The Project is located in a predominantly agricultural area, (e.g. modified habitat) with little natural vegetation that can be considered natural habitat. This conclusion is based on aerial imagery and web based searches of local, regional and national biodiversity sensitivity as well on the information in the EIA. The Project has hired the services of cultural resources consultants to conduct surveys in the area of the Project. This effort is coordinated with IPHAN. While there are several fauna species of local importance that may be impacted, the Project proposes monitoring and relocation as appropriate and in coordination with agencies.

#### 4.2 SPECIFIC FINDINGS

The results of document review and a site visit conducted by ERM did not identify any critical impacts likely to result from the Project. However, there are issues that need to be addressed to prevent additional environmental, health and safety, and social impacts. These findings are discussed below, organized by the relevant IFC Performance Standard:

##### **PS 1: Social and Environmental Assessment and Management Systems**

The Project was subject to the Brazilian environmental permitting process that included the preparation of an environmental impact assessment that was reviewed by the State of Santa Catarina Environmental Protection Agency, FATMA. As part of the permitting process, the company conducted public consultation and engaged in direct communication and negotiation with families directly affected by the Project. Overall, the Brazilian permitting process follows the intent and process recommended by the IFC’s PS 1.

PS 1 Social and Environmental Assessment and Management Systems is addressed under the discussions relating to the EPs for Social and

Environmental Assessment, Action Plan and Management System, Consultation and Disclosure, Grievance Mechanism, and Independent Monitoring and Reporting. (See Section 5.0)

**PS 2: Labor and Working Conditions**

- Emergency Response: At the time of the site visit, the construction site did not have trained employees who could assist with emergency response. The staff indicated that they would be training some employees to assist in the event of an emergency.
- First aid supplies: At the time of the site visit, the onsite first-aid facility had not received the necessary supplies to provide first-aid assistance. The facility had two small first-aid kits. Facility staff indicated that the supplies would arrive that week.
- Access road conditions: The site visit was conducted during a week of intense rain. The access roads were observed to consist of red clayey soil. Under such conditions, most vehicles and trucks could be susceptible to sliding. Supposedly gravel had been laid on the ground, but had been already mixed with the soil.

**PS 3: Pollution Control and Abatement**

- Waste Management: given the re-use of the former PCH Ludesa project, the Project appears has “inherited” a number of environmental “housekeeping” issues. The Project should make clear to Construtora Gomes Lourenço that these are their responsibilities to clean up and resolve. These include:
  - a) Paving and bunding at the fuel storage areas needs improvement to assure the ground surface is fully impervious, the bunds are impervious, and the water release drains are only maintained closed except when drainage of accumulated water is required.
  - b) Drums and containers in the hazardous waste storage area did not have lids and were not properly identified/labeled.
  - c) The hazardous waste storage area did not have any cover and containers were exposed to the elements.
  - d) A large dumpster that is used to collect hazardous waste is placed on unpaved ground.
  - e) A coal pile, apparently used in constructing footers for the dams, is stored on bare ground without any impervious surface underneath. No information could be provided for how long that pile was there or when it would be removed.
  - f) There are a number of drums of concrete mix and other products.
  - g) At the site of the new staging area, trash was observed in a ditch between the future cafeteria and lodging.
- Spill response capacity:
  - a) Absence of Spill Control Kits: At the time of the site visit, the site did not have kits to deal with spills, and fuel was being transported to the site via trucks on a daily basis. In the event of a spill, there would not have been any equipment, supplies, or

trained personnel to respond to the spill. Corrective action is necessary.

**PS 4: Community Health, Safety and Security**

- **Traffic Awareness:** The current 10-km access to the Project Site crosses a residential area via an unpaved municipal road. The increase in traffic by vehicles and heavy truck and equipment increases the potential for accidents. At the time of the site visit, there was no traffic plan to educate workers or to warn residents of the dangers caused by the increase in traffic of vehicles and heavy trucks near those residences.
  
- **Community Awareness and Communication Program for Traffic:** The existing construction camp located along state highway SC-480 is immediately surrounding by the community of São Domingos, adjacent to an industrial facility that produces recycled materials, and the PCH Ludesa Dam. Some workers will be lodged at this site. Communication with the local community is crucial to prevent potential traffic accidents and injuries.
  
- **Two houses will be very close to construction activities and operations:** two residences were observed to be very close to the future location of the power house and dam. These families will be affected by noise, dust, traffic by trucks and heavy equipment and potential tremors associated with the detonation for the construction of the tunnel and rock quarry. Potential impacts on these families had apparently not been considered.

**PS 4: Land Acquisition and Involuntary Resettlement**

- **Directly Impacted Families:** there appears to be a need for social specialists to be involved in the negotiations and relationship with the directly impacted families: Negotiations for acquisition or lease of properties directly impacted by the Project are being conducted by personnel from Gomes Lourenço. While these people focus on paying the fair price for land acquisition or lease, they are not trained social specialists.

## CONCLUSIONS

### 5.1 REVIEW AND CATEGORIZATION

Based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC, ERM would recommend that the Santa Luzia Alto PCH be considered a Category B project.

### 5.2 SOCIAL AND ENVIRONMENTAL ASSESSMENT AND MANAGEMENT SYSTEMS

As noted above, the Project was subject to the Brazilian environmental permitting process that included the preparation of an environmental impact assessment that was reviewed by the State of Santa Catarina Environmental Protection Agency, FATMA. As part of the permitting process, the company conducted public consultation and engaged in direct communication and negotiation with families directly affected by the Project. Overall, the Brazilian permitting process follows the intent and process recommended by the IFC's PS 1.

A potential impact which was not addressed in the EIA was the potential cumulative effects of multiple dams. However, given the national program and the number of existing dams in the river basin, it is likely that the cumulative effects are already manifested and these additional dams will not significantly increase the effect. Arguably, it is the first dam that has the greatest impact on a specific river, and that is not the situation. The Project is located between two existing dams. Also, ecological or environmental flows <sup>(1)</sup> have been considered as part of the design and approval process.

Consequently, the adverse effects of the specific project are likely limited to the local environment and population. In addition, according to EIA and supporting information, there are no significant predicted impacts associated with the construction and operation of the Project.

The management system aspects of PS1 were addressed by the project under the Brazilian PCA requirements (see Section 5.4 below).

### 5.3 APPLICABLE SOCIAL AND ENVIRONMENTAL STANDARDS

Brazilian EIA and related requirements are robust and at least partially comparable to the IFC Performance Standards. The Project has obtained or is in the process of obtaining environmental licenses and authorization from various agencies. Therefore, the Project appears to be in compliance with applicable in-country regulations in regards to licenses and authorizations.

PS 1, Social and Environmental Assessment and Management Systems is addressed under the discussions relating to Social and Environmental

(1) Consideration of the downstream effects of an altered hydrologic regime on the river ecosystem.

Assessment, Action Plan and Management System, Consultation and Disclosure, Grievance Mechanism, and Independent Monitoring and Reporting.

PS 2, Labor and Working Conditions is applicable to the issues identified relating to emergency response, first aid, drinking water quality, air quality, access road conditions, and the absence of a traffic plan.

PS 3, Pollution Prevention and Abatement is applicable to the issues identified relating to air quality, secondary containment, waste management, spill response capacity, hazardous materials storage, the oil/water separator, the septic system, and environmental liabilities.

PS 4, Community Health, Safety and Security is applicable to the issues identified relating to air quality, and the absence of a traffic plan, as these have the potential to affect members of the local community in the vicinity of work areas and the construction transportation routes.

PS 5, Land Acquisition and Involuntary Resettlement is applicable as land acquisition is taking place. There is no formal Resettlement Action Plan in place. Compensations of acquired or leased areas have been conducted in accordance with Brazilian guidelines and are conducted between personnel from Gomes Lourenço and the property owners or people occupying the land. There is no independent third-party involved in the negotiation. Although some houses may be relocated within the same property, there is no wholesale resettlement of families to other sites. The Sponsor has not been able to negotiate an agreement with the owner of a large property and requested that ANEEL declare the portion of the property affected by the Project to be considered public utility for expropriation.

No critical habitats or significant natural habitats are present in the area affected by the PCH, therefore PS 6 does not merit special consideration. Likewise, there are no significant cultural heritage features or any indigenous peoples in the affect environment which trigger further consideration of PS 7 or PS 8.

#### **5.4 ACTION PLAN AND MANAGEMENT SYSTEM**

As part of the EIA and licensing process, the Sponsor has prepared an Environmental Management Plan (PCA), as required by Brazilian legislation and which also includes social elements. This plan was presented to the FATMA as part of the approval for the environmental licenses required to begin the project and thus the PCA can be considered compliant with Brazilian legal requirements as written.

The management system appears to be generally commensurate with the types and magnitude of impacts predicted by the EIA; however, there is no specific Action Plan that details and prioritizes the actions required to implement the proposed management plans.

## **5.5 CONSULTATION AND DISCLOSURE**

The Project Sponsor has carried out generally broad consultation and communication by the Project to date; however, there are areas for improvement regarding the frequency and quality of communications with the affected families and community, as discussed under *Specific Findings* above.

## **5.6 GRIEVANCE MECHANISM**

Despite the generally broad consultation and communication by the Project to date, it is not clear that there is a specific grievance mechanism in place and that such has been communicated to the affected stakeholders.

## **5.7 INDEPENDENT REVIEW**

ERM was contracted by Conduit to carry out the independent review of the project.

## **5.8 INDEPENDENT MONITORING AND REPORTING**

The Project has not been subject to independent monitoring beyond the brief limited due diligence site visit by ERM and there is no reporting mechanism in place.

ERM provides the following recommendations, organized by the respective Equator Principles/IFC Performance Standard, as applicable:

**PS 2: Labor and Working Conditions:**

- **Drinking Water Quality:** If drinking water for the staging area near the Chapecó River is provided by the onsite well, water quality needs to be monitored in accordance with Health Ministry Ordinance No. 518/2004.
- **Air Quality:**
  - **Tunnel:** when tunnel construction starts, air quality inside of the tunnel needs to be monitor to ensure good air quality conditions for workers.
  - **Gravel yard/conveyor belt:** Measures to minimize generation of suspended particulates should be implemented. These could include cover for the system and use of spray system.
  - **Dust at neighboring houses:** disturbed areas and access roads should be watered to minimize generation of dust, especially near residences.

**PS 3: Pollution Prevention and Abatement**

- **Secondary Containment:** The secondary containment for above ground fuel tanks must be sealed to prevent product from migrating outside of the containment.
- **Waste Management:** record keeping procedures for generation, storage, transportation and disposal of non-hazardous and hazardous waste must be implemented to ensure proper documentation of these wastes. Manifests must be signed.
- **Hazardous waste storage areas** must include pavement to prevent spills to soil/subsurface and cover. Drums and containers should have lids.
- **Oil/water separator:**
  - **Effluent Quality:** Before effluent from the oil/water separator is allowed to discharge to the ground and flow into the nearby surface water body, its quality must be monitored to demonstrate compliance with CONAMA Resolution No. 357/2005 or with state requirements.
  - **Potential hazardous waste into oil/water separator:** Drainage from the hazardous waste storage area should not be allowed to flow into the oil/water separator if solvents and other non-petroleum based wastes are stored in the area.
- **Septic Tanks:** The septic tanks needs to be monitored to prevent overflow and onsite environmental manager must keep records of volume of sanitary waste pumped from site.

- Environmental liabilities: The construction camp retains relatively minor, holdover environmental liabilities from the prior project. The Sponsor should develop a plan to assess these potential environmental liabilities and develop corrective actions. Specifically, areas around waste storage areas, oil/water separator, septic tank, coal pile, chemical storage should be evaluated to assess potential soil and groundwater contamination.

#### **PS 4 : Community Health, Safety and Security**

- Assessment of families close to construction activities: at least two residences were observed to be located very close to the location of the power house and future dam. Noise, traffic, dust, tremors from detonations could cause significant inconvenience to these families, especially if construction activities were conducted 24 hours a day.
- Traffic Plan: The sponsor needs to assess traffic impacts from the existing staging area along SC-480 to the Project site. Additional measures such as driving awareness and constant and direct communication with residents may be needed to prevent accidents, noise and dust to residents.

#### **PS 5: Land Acquisition and Involuntary Resettlement**

- Resettlement Action Plan: At the moment, the Sponsor is negotiating compensation, but there is no assessment of additional needs of these families. The Sponsor should develop and implement a Resettlement Action Plan consistent with the requirements of IFC PS 5.

#### **Action Plan and Management System**

- The Sponsor should develop an Action Plan to achieve full compliance with the applicable social and environmental standards and the Equator Principle/PSs gaps identified by this report. Several specific measure are recommended below:
- Vegetation Clearing Permit: The authorization for vegetation clearing expired on September 30, 2008 and the Sponsor has requested its renewal. No vegetation clearing should be conducted until a renewed authorization has been granted by the FATMA.
- Social Specialist: At a minimum, the Sponsor should hire a social specialist consultant to assess the needs of the population directly affected by the Project and to monitor their situation. The Sponsor should consider engaging a social specialist to address similar issues across other PCH projects.
- Grievance Mechanism: The Sponsor should develop a formal grievance mechanism and communicate its availability to the affected stakeholders.
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- Independent Monitoring: Conduit should consider retaining the services of an independent monitor for the social and environmental aspects of the PCH portfolio.