

**FINAL TERMS OF REFERENCE  
ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT**

**FOR THE**

**TOTAL E&P CANADA LTD.**

**OIL SANDS BITUMEN UPGRADER PROJECT**

**County of Strathcona  
Northeast of Edmonton, Alberta**

**ISSUED BY: ALBERTA ENVIRONMENT**

**DATE: December 12, 2007**

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b> .....	1
1.1	Background.....	1
1.2	Scope .....	1
<b>2.0</b>	<b>CONSULTATION</b> .....	2
<b>3.0</b>	<b>PROJECT DESCRIPTION</b> .....	2
3.1	The Proponent .....	2
3.2	Project Development .....	3
3.3	Evaluation of Alternatives .....	3
3.4	Project Processes and Facilities .....	4
3.5	Utilities and Transportation .....	5
3.6	Air Emission Management .....	6
3.7	Water Management .....	7
3.8	Waste Management .....	7
3.9	Conservation and Reclamation .....	8
3.10	Environmental Management Systems .....	8
3.11	Regional and Cooperative Efforts .....	9
<b>4.0</b>	<b>ENVIRONMENTAL ASSESSMENT PROCESS REQUIREMENTS</b> .....	9
4.1	Information Requirements .....	9
4.2	Cumulative Environmental Effects .....	10
4.3	Assessment Scenarios .....	11
4.4	Study Areas .....	11
4.5	EIA Report Summary .....	11
<b>5.0</b>	<b>ENVIRONMENTAL ASSESSMENT</b> .....	12
5.1	Climate and Air Quality .....	12
5.2	Noise and Light .....	13
5.3	Hydrogeology .....	13
5.4	Surface Water Hydrology and Quality .....	14
5.5	Aquatic Resources .....	16
5.6	Vegetation.....	17
5.7	Wildlife.....	17
5.8	Biodiversity and Fragmentation .....	18
5.9	Terrain and Soils.....	18
5.10	Land Use.....	19
<b>6.0</b>	<b>PUBLIC HEALTH AND SAFETY</b> .....	20
<b>7.0</b>	<b>HISTORIC RESOURCES</b> .....	21
<b>8.0</b>	<b>SOCIO-ECONOMIC ASSESSMENT</b> .....	21

## **1.0 INTRODUCTION**

### **1.1 BACKGROUND**

- [A] Total E&P Canada Ltd. (Total) is required to prepare an Environmental Impact Assessment (EIA) Report for its proposed Upgrader (the Project) which would be located in the County of Strathcona.
- [B] The proposed site is located within portions of the W ½ and SE ¼ of Section 18, the majority of Section 19, and the W ½ of Section 20, in Township 55, Range 21, W4M, four kilometres (km) northeast of Fort Saskatchewan, Alberta and 40 km northeast of Edmonton. The proposed site secured by Total is in an area zoned for heavy industrial development.
- [C] The Upgrader will process and convert bitumen and/or heavy oil into synthetic crude oil for end market uses. Feedstock for the proposed Upgrader will be bitumen produced from Total upstream assets, or from other third party bitumen producers. The proposed Upgrader will have a first phase design capacity of 150,000 barrels of oil sands bitumen feed per day increasing in a second phase to 245,000 barrels of oil sands bitumen feed per day. (Note: the capacity has been refined since the release of the Public Disclosure Document in May 2007.)
- [D] The purpose of these Terms of Reference is to identify for Total and the public the information required by government agencies for an EIA report.

### **1.2 SCOPE**

- [A] Total will prepare and submit an EIA report that examines the environmental and socio-economic effects of the construction, operation, decommissioning and reclamation of the Project.
- [B] The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under the *Environmental Protection and Enhancement Act* (EPEA) and the *Canadian Environmental Assessment Act*, as applicable.
- [C] The EIA report shall be prepared with consideration to applicable provincial and federal legislation, codes of practice, guidelines, standards and directives.
- [D] The study area for the EIA (Study Area) shall include the Project Area, as well as the spatial and temporal limits of individual environmental components outside the Project Area boundaries where an effect can be reasonably expected. The EIA Study Area includes both Local and Regional Study Areas.
- [E] The EIA report is intended to:
  - a) assist the public and government in understanding the environmental and socio-economic consequences of the Project's development, operation and reclamation plans, and will assist the Proponent in its decision-making process;
  - b) address:
    - i) project impacts,
    - ii) mitigation options, and
    - iii) residual effects relevant to the assessment of the Project including, as appropriate, those related to other industrial operations; and
  - c) discuss possible measures, including established measures and possible improvements based on research and development to:
    - i) prevent or mitigate impacts,
    - ii) assist in the monitoring of environmental protection measures, and

- iii) identify residual environmental impacts and their significance including cumulative and regional development considerations. As appropriate for the various types of impacts, discussion of impact predictions should be presented in terms of magnitude, frequency, duration, seasonal timing, reversibility, and geographic extent.

[F] The EIA report will be a part of Total's integrated Application to the Alberta Energy and Utilities Board (EUB) and Alberta Environment (AENV) for construction, operation, decommissioning and reclamation of the Upgrader. A summary of the EIA report will also be included as part of the Application.

[G] The EIA report shall include a concordance table that cross-references the EIA report to the Terms of Reference and shall include a glossary of terms and a list of abbreviations to assist the reader in understanding the material presented.

## **2.0 CONSULTATION**

[A] Total will undertake a consultation program during the preparation of the EIA report. As part of this consultation program, Total will consult with the following potentially affected stakeholders:

- a) residents of surrounding communities;
- b) recognized land users of the Local Study Area;
- c) industrial, recreational and regional environmental monitoring groups and individuals expressing a formal interest in the Project;
- d) federal, provincial, and municipal representatives, as applicable;
- e) other operating or planned developers in the region;
- f) other potentially affected parties; and
- g) local Aboriginal groups.

[B] Total shall:

- a) describe and document the public consultation program implemented including plans to coordinate consultation activities with other developers in the area;
- b) record any concerns or suggestions made by the public and demonstrate how these concerns have or will be addressed; and
- c) discuss:
  - i) how the concerns and issues identified by Total and stakeholders influenced the Project development, design, impact mitigation and monitoring or how it was addressed,
  - ii) the type of information provided and the issues discussed, including those that have been resolved and those that remain outstanding,
  - iii) for unresolved issues, the key alternatives which have been identified by Total and stakeholders for future consultations as well as mechanisms and timelines for that resolution, and
  - iv) plans to maintain and support the public consultation process following completion of the EIA report review.

## **3.0 PROJECT DESCRIPTION**

### **3.1 THE PROPONENT**

[A] Provide:

- a) the name of the proponent;
- b) a corporate profile; and

- c) the name of the legal entity that will develop, manage and operate the Project and hold the operating approvals.

[B] Describe Total's history in Alberta's oil and gas industry, with specific reference to existing and proposed petroleum developments.

### **3.2 PROJECT DEVELOPMENT**

[A] Provide a development plan that includes:

- a) the phases of development;
- b) processing facilities;
- c) other buildings, structures and infrastructure; and
- d) activities associated with development of the area, operations, reclamation and closure.

[B] Provide a schedule outlining the proposed phasing, sequencing and duration of components, including:

- a) the timing of key steps in the pre-construction, construction, operation, decommissioning, and reclamation stages of each phase;
- b) the key factors controlling the schedule and uncertainties; and
- c) implications resulting from a delay in proceeding with the Project, or any phase of the Project.

### **3.3 EVALUATION OF ALTERNATIVES**

#### **3.3.1 Project Alternatives**

[A] Discuss the need for the Project addressing the following:

- a) alternative means of carrying out the Project that are technically and economically feasible and, where applicable, indicate their potential environmental effects and impacts;
- b) compare identified alternatives to the Project or components of the Project and the anticipated effects and impacts of the alternatives. Discuss reasons for not selecting any identified alternatives;
- c) implications resulting from a delay in proceeding with the Project, or any phase of the Project; and
- d) potential cooperative development opportunities for the Project (e.g., shared infrastructure).

[B] Discuss the implications of not going ahead with the Project.

#### **3.3.2 Process and Infrastructure Alternatives**

[A] Discuss the site selection process including, but not limited to, the following:

- a) factors that were considered in determining the preferred sites for the plant and associated processing facilities;
- b) the site selection process for the proposed location of Project components;
- c) the rationale for choosing the proposed sites instead of alternative sites;
- d) the technical, geotechnical, economical, and environmental criteria considered; and
- e) potential impacts on environmental and land use conditions.

[B] Discuss the alternative technologies considered for bitumen upgrading and provide the rationale for the technologies selected.

[C] Discuss the route or site selection criteria for any linear or other infrastructure development or modification and provide the rationale for selecting the proposed alignment and design.

- [D] Discuss the options considered for supplying the thermal energy and electric power required for the Project and their environmental implications. Discuss the implications that alternate fuel sources may have on the selection of equipment or technologies.
- [E] Discuss alternatives considered for air emission control technology.
- [F] Discuss alternatives considered as water supply sources for the Project, including on-site storage. Describe the criteria and rationale for selecting the preferred water supply sources.
- [G] Discuss options and technologies considered for wastewater treatment, wastewater management strategies and wastewater disposal and reasons, including water quality and environmental considerations, for selecting the preferred options in the context of best management practices and best available technologies.
- [H] Discuss the waste disposal options. Discuss the strategy for on-site versus off-site waste disposal and identify:
  - a) the proposed locations of on-site waste management facilities, including landfills, if applicable;
  - b) the availability of off-site waste disposal facilities;
  - c) the suitability of the site(s) from a groundwater protection perspective (provide geo-technical information to support the siting of management facilities);
  - d) site suitability with regard to existing and potential human activities in the area; and
  - e) potential effects on the environment.

### **3.4 PROJECT PROCESSES AND FACILITIES**

#### **3.4.1 Project Components**

- [A] Describe the nature, size, location and duration of the significant components of the Project including, but not limited to, the following:
  - a) the plant site and any chemical/fluids storage locations;
  - b) the design capacities and the changes in design capacities during the life of the Project;
  - c) temporary structures, dewatering, water control facilities, and processing/treatment facilities;
  - d) buildings and infrastructure, transportation, utilities, access routes, and storage areas;
  - e) water source well locations and intakes;
  - f) the types and amounts of waste materials, and locations of waste storage, and disposal sites;
  - g) how Total has used community input for Project design and development; and
  - h) cooperative ventures to minimize environmental impacts.
- [B] Provide appropriately scaled maps and/or drawings of the project components and activities including:
  - a) existing infrastructure;
  - b) upgrading facilities;
  - c) other buildings and infrastructure (pipelines and utilities);
  - d) temporary structures;
  - e) transportation and access routes;
  - f) on-site hydrocarbon storage;
  - g) containment structures such as berms and retention ponds;
  - h) water wells/intakes, pipelines, and storage structures; and
  - i) waste storage areas and disposal sites.
- [C] Provide a list of facilities for which locations will be determined later.

- [D] Provide a description and timing of land clearing and/or soil stripping required for:
  - a) bitumen processing and upgrading facilities;
  - b) roads, pipelines and utilities; and
  - c) other site preparation activities.
- [E] Discuss planned accommodations for the workforce during the construction and operations stages.

### 3.4.2 Process Description

- [A] Describe the upgrading and other related processes and process facilities of the Project, including the following:
  - a) the energy efficiency and process efficiency of chosen technologies; and
  - b) shared facilities and utilities associated with the Project.
- [B] Discuss the amount and source of energy required for the Project;
- [C] Provide a listing of chemical products to be used for the Project. Identify products containing substances that are:
  - a) *Canadian Environmental Protection Act, 1999* toxics;
  - b) dangerous goods as defined by the federal *Transportation of Dangerous Goods Act*;
  - c) on the National Pollutant Release Inventory; and
  - d) on the Domestic Substances List and categorized as requiring further assessment under Canada's Chemicals Management Plan.
- [D] Identify the location and amount of short and long term storage for catalysts, chemicals, inputs, products, by-products (including sulphur and coke), intermediates and wastes, and:
  - a) discuss potential interactions between stored chemicals and wastes;
  - b) identify hazardous by-products that could potentially be formed and process design and operational practices that will minimize their formation; and
  - c) describe containment and environmental protection measures.
- [E] Provide material balances, energy balances, and process flow diagrams for the processes including:
  - a) inputs such as bitumen, energy and water, and the outputs such as emissions and wastes;
  - a) effect of technology on waste generation and storage requirements, air and water discharges, water requirements, waste streams, and effects to reclamation programs; and
  - b) sources of major feed materials for the upgrading process including bitumen feedstock and limestone, as well as other feedstocks.

### 3.5 UTILITIES AND TRANSPORTATION

- [A] Describe other infrastructure requirements including, but not limited to, the following:
  - a) worker travel routes to the plant site during the life of the Project, including:
    - i) desired traffic routing,
    - ii) control methods, and
    - iii) road use agreements;
  - b) any expected changes and impacts in traffic volume by Average Annual Daily Traffic (AADT) and any seasonal variability in traffic volume;
  - c) the result of consultation with the local transportation authorities including transportation studies that are underway or planned;

- d) the adequacy in design and upgrades required of all utility lines, roads, and pipeline crossings of roads and watercourses;
- e) transportation and utility design features to prevent spills, contingencies for spill response, and any environmental risks associated with product releases or management practices;
- f) the alignment, contents, and size of any raw material or product pipelines to be located within the Study Area. If regional pipeline and storage infrastructure are required, identify the locations and routes of these facilities and the authority responsible for their approval, installation and operation;
- g) by-product transportation from the Upgrader site; and
- h) the natural gas source and pipeline, electrical power transmission and access to the Project. If regional infrastructure is required, identify the locations and routes, and who would be responsible for installation and approval for the facilities.

### 3.6 AIR EMISSION MANAGEMENT

[A] Develop profiles (type, rate, and source) for the Project's operating emissions including point and non-point sources and fugitive emissions and for construction emissions. Consider normal operating conditions, worst-case conditions and upset conditions and include definitions of these conditions.

[B] Discuss the following:

- a) odorous or visible emissions;
- b) Total's overall greenhouse gas (GHG) management plans and address the following:
  - i) the annual and total emissions of GHGs over the life of the Project,
  - ii) the Project's contribution to total provincial and national GHG emissions on an annual basis,
  - iii) the intensity of GHG emissions per unit of bitumen produced and how it compares to similar projects, and
  - iv) the use of offsets and the expected results from implementing GHG management plans;
- c) the amount and nature of acidifying emissions, probable deposition patterns and rates;
- d) flare management planning, including emergency flaring scenarios (e.g., frequency and duration), and proposed measures to ensure flaring events are minimized;
- e) control technologies proposed for the Project in the context of best-available and economically viable commercial technologies, and Alberta Environment and Canadian Council of Ministers of the Environment (CCME) guidelines and codes of practice related to the following:
  - i) minimizing air emissions such as sulphur dioxide (SO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S), oxides of nitrogen (NO<sub>x</sub>), GHGs, volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs) and particulate matter,
  - ii) minimizing fugitive emissions and odours from equipment leaks,
  - iii) optimizing gas collection and conservation, and
  - iv) minimizing emissions which lead to formation of secondary particulate matter (PM<sub>x</sub>) and ozone (O<sub>3</sub>);
- f) the incremental contribution of the Project to regional (Edmonton Census Metropolitan Area) emissions of PM<sub>2.5</sub> and PM<sub>10</sub> and ground-level ozone precursors including NO<sub>x</sub>, SO<sub>2</sub>, VOCs and ammonia; and
- g) applicability of sulphur recovery, acid gas re-injection, or flue gas desulphurization to reduce sulphur emissions.

### **3.7 WATER MANAGEMENT**

#### **3.7.1 Water Supply**

- [A] Describe the water supply requirements for the Project including, but not limited to, the following:
- a) the overall water balance;
  - b) the process, non-potable and potable water requirements for construction, start-up, normal operating conditions, worst case conditions and emergency operating situations, decommissioning and reclamation;
  - c) the variability in the amount of water required on an annual and seasonal basis as the Project is implemented;
  - d) proposed water supply sources referencing, as appropriate, technical information in the *Water Act* application;
  - e) the location of water sources/intakes and associated infrastructure (pipelines) and potential modifications with the Project;
  - f) intake design, where water is to be sourced from local waterbodies;
  - g) potable water treatment systems for the life of the Project including the type and quantity of water treatment chemicals used; and
  - h) measures taken by Total to contribute to improvements in water use efficiency and productivity.

#### **3.7.2 Surface Water Management**

- [A] Describe Total's surface water management strategy for the life of the Project, including the following:
- a) design factors considered, such as:
    - i) site drainage and road run-off control,
    - ii) containment,
    - iii) erosion/sediment control,
    - iv) slumping areas,
    - v) flood protection,
    - vi) groundwater protection, and
    - vii) groundwater seepage; and
  - b) permanent or temporary alterations or realignments of watercourses, wetlands and other waterbodies.

#### **3.7.3 Wastewater Management**

- [A] Describe Total's wastewater management strategy including, but not limited to, the following:
- a) source, quantity and composition of each wastewater stream from the Project;
  - b) design of facilities that will handle, treat, and store wastewater streams;
  - c) type, chemical name and quantity of chemicals used in wastewater treatment;
  - d) the disposal of wastewater streams created by the Project;
  - e) sewage treatment systems that will be installed as components of the Project;
  - f) how the wastewater management strategy will be incorporated into project design; and
  - g) the principles that have been incorporated into the project design for pollution prevention, wastewater minimization and recycling.

### **3.8 WASTE MANAGEMENT**

- [A] Characterize and quantify the anticipated dangerous goods and hazardous, non-hazardous, and recyclable wastes generated and used by the Project. Provide the following:

- a) the composition and volume of specific waste streams generated by the Project, and identify how each stream will be managed;
- b) a classification of the wastes generated according to the *Alberta User Guide for Waste Managers*; and
- c) plans for waste minimization, recycling, pollution prevention and management over the life of the Project. Discuss methods and technologies to reduce waste quantities to the lowest practical levels.

### 3.9 CONSERVATION AND RECLAMATION

[A] Provide a conceptual soil conservation and reclamation plan for the Project Area and discuss the following:

- a) a soil conservation and salvage plan that outlines the following:
  - i) the criteria and methods to be used in salvaging soils,
  - ii) salvage areas, depths, types, quality and volumes,
  - iii) the procedures for soil handling and storage of salvaged topsoils and subsoils, including the location of stockpiles, and
  - iv) alternatives for the long-term storage of salvaged soils;
- b) soil replacement plans specifying the techniques, timing, depth, volume and type of reclamation material;
- c) the suitability and availability of soil materials within the Project Area for reclamation;
- d) the anticipated timeframes for completion of reclamation activities;
- e) the parameters that should be used to monitor and evaluate the reclaimed land;
- f) any constraints to reclamation such as timing of activities, availability of materials and influence of natural processes and cycles;
- g) any soil-related constraints or limitations that may affect salvage and reclamation; and
- h) a revegetation plan for disturbed areas, identifying the species that will be used for seeding or planting, and vegetation and weed management practices.

[B] Discuss how the conservation and reclamation plan design will:

- a) return equivalent land capability as compared to pre-disturbance conditions;
- b) assess for and mitigate/remediate on-site contamination;
- c) integrate the proposed landscape with surrounding landscapes including inter-connectivity to surrounding landscapes;
- d) integrate surface- and near-surface drainage within the Project Area; and
- e) be incorporated into planning and development of the Project.

### 3.10 ENVIRONMENTAL MANAGEMENT SYSTEMS

[A] Summarize key elements of Total's existing or proposed environmental, health and safety management system and discuss how it will be integrated into the Project, addressing the following:

- a) operating plans and performance standards to be developed prior to the commissioning of the plant;
- b) plans to minimize the production or release into the environment of substances that may have an adverse effect, including a conceptual contingency plan that considers operational upset conditions, such as serious malfunctions or accidents, and unpredicted negative impacts that are realized during the Project;
- c) an emergency response plan that includes:
  - i) emergency reporting procedures for spill containment and management,
  - ii) emergency response, public notification and public safety procedures, and

- iii) measures to protect the safety of personnel;
  - d) adaptive management plans that minimize the impact of the Project at the design stage. Describe the flexibility built into the plant design and layout to accommodate future modifications required by any change in emission standards, limits and guidelines; and
  - e) air and water emissions, waste tracking and process inputs and outputs.
- [B] Describe Total's current and proposed source monitoring programs with respect to the following:
- a) air emissions, including fugitive emissions;
  - b) wastewater treatment and release; and
  - c) hazardous and non-hazardous waste treatment and storage.
- [C] Provide a conceptual plan to monitor reclamation performance and success.
- [D] Discuss how the results of monitoring programs will be integrated with Total's environmental management system.

### **3.11 REGIONAL AND COOPERATIVE EFFORTS**

- [A] Document Total's participation in regional cooperative efforts to address environmental, health and socio-economic issues associated with regional industrial development, including:
- a) Total's current and planned participation in regional monitoring and management activities, such as the Fort Air Partnership, to address environmental, health and socio-economic issues;
  - b) Total's current and planned cooperative ventures with other operators to minimize the environmental impact of the Project or the environmental impact of regional industrial development;
  - c) how Total will work to develop and implement cooperative opportunities;
  - d) monitoring activities that will be undertaken to assist in managing environmental protection strategies. Discuss how any result will contribute to Total's participation in the regional efforts; and
  - e) how regional environmental management initiatives will be incorporated into Total's management practices.
- [B] Discuss Total's regional monitoring activities including:
- a) monitoring that will be undertaken to assist in managing environmental effects, confirming performance of mitigative measures and improving environmental protection strategies;
  - b) monitoring done independently by Total;
  - c) monitoring performed in conjunction with other stakeholders;
  - d) the use of publicly-available monitoring information; and
  - e) new monitoring initiatives that may be required as a result of the Project.

## **4.0 ENVIRONMENTAL ASSESSMENT PROCESS REQUIREMENTS**

### **4.1 INFORMATION REQUIREMENTS**

- [A] Basic environmental information requirements for the EIA report will include the following for each relevant section:
- a) quantitative and qualitative information about the environmental and ecological processes in the Study Area. Provide data and identify their sources;
  - b) information about the existing and planned human activities in the Study Area, and the nature, size, location and duration of their potential interactions with the environment,

- sometimes described as stressors (e.g., land disturbance, discharges of pollutants, changes to access status, consumption of renewable resources);
- c) information about ecological processes and natural forces which are expected to produce changes in environmental conditions (e.g., changes in climate, forest fires, flood or drought conditions, predator-prey population cycles), and which are relevant to the Project;
  - d) the demonstrated use of appropriate predictive tools and methods, enabling quantitative and qualitative descriptions of project effects and future conditions with the highest possible degree of certainty, and justification for the selection of models used. Identify limitations of the model(s), including sources of error and relative accuracy;
  - e) management plans to prevent, minimize or mitigate adverse effects and to monitor and respond to expected or unanticipated conditions;
  - f) a description of residual effects after mitigation and their consequences for the environment as well as for regional management initiatives that are underway or in development;
  - g) evaluation of the significance of the residual effects, including the probability of the effect occurring; and the importance of the consequences (measured quantitatively against management objectives and guidelines or baseline conditions and described qualitatively with respect to the views of Total and stakeholders); and
  - h) a record of assumptions, including an evaluation of impact prediction confidence in data and an analysis to support conclusions.
- [B] Document any assumptions used to obtain modeling predictions submitted as part of the EIA report. Clearly identify the limitations of the model(s) and data used in modeling, including sources of error and relative accuracy. Discuss the rationale for using a particular model.
- [C] All maps, drawings and photo mosaics shall include scales, “North” orientation arrows, legal land survey grids (section, township and range), and important geographic or topographic features. The information presented on maps and diagrams must be clearly labelled either directly on the document or through a legend. The scale of maps, drawings and diagrams shall be appropriate to the information being presented.

#### 4.2 CUMULATIVE ENVIRONMENTAL EFFECTS

- [A] Assessment of cumulative effects will be an integral component of the EIA report. Total will assess cumulative environmental effects for each scenario of the Project based on the EUB/AENV/Natural Resources Conservation Board Information Letter, *Cumulative Effects Assessment in Environmental Impact Assessment Reports under the Alberta Environmental Protection and Enhancement Act*. This will include a summary of all proposed monitoring, research and other strategies or plans to minimize, mitigate and manage any potential adverse effects. The identification and assessment of the likely cumulative environmental effects of the Project will:
- a) define the spatial and temporal Regional Study Area boundaries and provide the rationale for assumptions used to define those boundaries for each environmental component examined;
  - b) describe the current (baseline) state of the environment in the Regional Study Area;
  - c) assess the incremental consequences that are likely to result from the Project in combination with other existing, approved and planned projects in the region;
  - d) demonstrate that information and data used from other development projects is appropriate for use in this EIA report. Include a description of the deficiencies or limitations in the existing database for relevant components of the environment; and

- e) explain the approach and methods used to identify and assess cumulative effects including cooperative opportunities and initiatives to further collective understanding of cumulative effects. Provide a record of relevant assumptions, confidence in data and analysis to support conclusions.

#### **4.3 ASSESSMENT SCENARIOS**

[A] Define the environmental assessment scenarios including:

- a) a Baseline Case, which includes existing environmental conditions and existing and approved projects or activities;
- b) an Application Case, which includes the Baseline Case plus the Project; and
- c) a Planned Development Case, which includes existing and anticipated future environmental conditions, existing projects or activities, the Application Case, plus other planned projects or activities.

Note: For the purposes of defining assessment scenarios, “approved” means approved by the applicable federal, provincial or municipal regulatory authority. “Planned” is considered any project or activity that has been publicly disclosed during the time period ending six months prior to the submission of the EIA report.

#### **4.4 STUDY AREAS**

##### **4.4.1 Project Area**

[A] The Project Area includes all lands subject to direct disturbance from the project and associated infrastructure. For the Project Area, Total must provide:

- a) the legal land description;
- b) the boundaries of Total’s property;
- c) the proposed EUB approval area;
- d) a map that shows the status of land tenure and zoning and identifies the locations of all proposed development activities and facilities; and
- e) a topographic map of appropriate scale showing the area proposed to be disturbed.

##### **4.4.2 Local and Regional Study Areas**

[A] The Local and Regional Study Areas for the EIA report include the Project Area and other areas based on individual environmental components where an effect from the Project can reasonably be expected.

[B] Total must provide the following:

- a) the scientific rationale used to define the spatial and temporal aspects of each Local and Regional Study Area considering the location and range of probable project and cumulative effects; and
- b) maps of appropriate scale that identify Local and Regional Study Area boundaries.

#### **4.5 EIA REPORT SUMMARY**

[A] Total must prepare a summary of the EIA report that will provide sufficient information to obtain a general understanding of the project and its potential positive and negative effects. The summary report will stand on its own merit; however, it can reference more detailed information presented in the EIA report itself.

[B] The summary report will provide an overview of the EIA report including:

- a) the project components and development activities which have the potential to affect the environment;

- b) existing conditions in the Study Area, including existing uses of lands, resources and other activities which have potential in combination with proposed development activities, to affect the environment;
- c) the environmental, cultural, and socio-economic effects of the project including the regional, temporal, and cumulative effects which are anticipated;
- d) proposed environmental protection plans, mitigation measures and monitoring;
- e) residual effects;
- f) significance of effects in terms of magnitude, extent, duration, seasonal timing, frequency and reversibility;
- g) a summary of objectives, guidelines and methodologies used by Total to evaluate the significance of effects;
- h) an overview of modeling techniques used to forecast potential effects and assumptions used in assessing potential impacts; and
- i) regulatory decisions that are needed for the project to proceed.

[C] The summary report will include suitable maps, charts and other illustrations to identify the components of the project, the existing conditions, and the environmental and the socio-economic implications of the development.

[D] List and discuss key environmental and socio-economic issues that were identified during the preparation of the EIA report and public consultation. Differentiate between emerging issues (with ongoing uncertainties), issues with quantifiable and significant effects, and issues that can be resolved through available technology and existing management approaches.

## **5.0 ENVIRONMENTAL ASSESSMENT**

### **5.1 CLIMATE AND AIR QUALITY**

#### **5.1.1 Baseline Information**

[A] Discuss the baseline climatic and air quality conditions in the area including the following:

- a) the type and frequency of meteorological conditions that may result in poor air quality; and
- b) appropriate ambient air quality parameters such as SO<sub>2</sub>, H<sub>2</sub>S, total hydrocarbons (THCs), NO<sub>x</sub>, VOCs, PAHs, individual hydrocarbons of concern in the THC, VOC and PAH mixtures, ground-level ozone (O<sub>3</sub>), visibility, trace metals, and particulates (total suspended particles, PM<sub>10</sub> and PM<sub>2.5</sub>).

#### **5.1.2 Impact Assessment**

[A] Identify components of the Project that will affect local and regional air quality, and:

- a) identify the potential for reduced air quality (including odours and visibility) resulting from the Project and discuss any implications of the expected air quality for environmental protection and public health. Evaluate this against the regional, provincial and national objectives for air quality;
- b) estimate ground-level concentrations of appropriate air quality parameters, include frequency distributions for air quality predictions in communities and sensitive receptors, and include an indication of maximum and 99.9 percentile for hourly predictions (98 percentile for any 24-hour modeling predictions of PM<sub>2.5</sub>);
- c) discuss any expected changes to particulate deposition or acidic deposition patterns;
- d) for acid deposition modeling, provide deposition data from maximum levels to areas with 0.17/keq/ha/yr Potential Acid Input (PAI). Include an analysis of PAI deposition levels on acid sensitive soils and water bodies, ensuring that the deposition levels used are representative of the Region. Identify areas that exceed PAI critical loading criteria;

- e) discuss interactive effects that may occur as a result of co-exposure of a receptor to all emissions; and
- f) describe air quality impacts resulting from the Project, and their implications for other environmental resources, including habitat diversity and quantity, vegetation resources, water quality and soil conservation.

[B] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters. Discuss what impacts the change to climate parameters may have on elements of the Project that are sensitive to climate parameters. Discuss the Project's flexibility to manage these changes.

[C] Describe how air quality impacts resulting from the Project will be mitigated.

[D] Describe the residual air quality effects of the Project and Total's plans to manage those effects.

### **5.1.3 Monitoring**

[A] Describe ambient air quality monitoring and receptor monitoring that will be conducted during each phase of the Project to assess air quality and the effectiveness of mitigation.

[B] Describe programs Total may implement to monitor the effects of acid deposition.

## **5.2 NOISE AND LIGHT**

### **5.2.1 Baseline Information**

[A] Provide representative baseline noise levels at receptor locations.

[B] Discuss baseline light level conditions.

### **5.2.2 Impact Assessment**

[A] Identify components of the Project that have the potential to increase noise and light levels and discuss the implications. Present the results of noise and light assessments. Include:

- a) potentially-affected people and wildlife;
- b) an estimate of the potential for increased impacts resulting from the development;
- c) the implications of any increased noise and/or light levels; and
- d) characterization of each noise type by tonality, impulsivity and intermittency.

[B] Describe mitigation measures to be utilized to minimize the production of noise at sensitive receptors.

[C] Describe mitigation measures to be utilized to minimize the production of light.

[D] Describe the residual noise and light effects of the Project and Total's plans to manage those effects.

### **5.2.3 Monitoring**

[A] Describe noise and light monitoring that will be conducted to assess noise and light levels and the effectiveness of mitigation.

## **5.3 HYDROGEOLOGY**

### **5.3.1 Baseline Information**

[A] Discuss baseline groundwater conditions and provide the following:

- a) a discussion of the characteristics of major aquifers, aquitards, and aquicludes;

- b) lithology, thickness and stratigraphic continuity of both surficial and bedrock geologic units within the Study Area;
- c) hydrogeologic information including hydraulic properties, depth to water, flow direction, velocity and connectivity with surface waterbodies of the geologic units;
- d) groundwater quality information of the hydrogeologic units in the Local Study Area, including but not limited to background concentrations of major ions, dissolved metals, F1/F2 hydrocarbon fractions, BTEX (benzene, toluene, ethylbenzene and xylene) and other potential contaminants of concern;
- e) maps and cross-sections that include groundwater table and potentiometric surfaces based on identifiable groundwater systems and accurate data sources, such as drill holes;
- f) results of any new hydrogeological investigations, including methodology;
- g) an inventory of groundwater users in the Local Study Area; and
- h) identify recharge and discharge zones.

### **5.3.2 Impact Assessment**

- [A] Identify Project components (e.g., dewatering, water supply wells) that could affect groundwater from a local and regional perspective.
- [B] Describe the potential project impacts on groundwater with respect to:
  - a) potential effects of Project-related water withdrawal on groundwater levels, effects on local and regional groundwater regimes, including vertical gradients and discharge areas;
  - b) the effects of groundwater withdrawal/dewatering and its implications for other environmental resources, including flows and water levels in local streams, wetlands, vegetation and soil saturation;
  - c) changes in groundwater quality; and
  - d) potential conflicts with other groundwater users and proposed mitigation.
- [C] Describe mitigation programs for the protection of groundwater resources, addressing the following:
  - a) conceptual groundwater monitoring program for early detection of potential contamination and assistance in remediation planning; and
  - b) groundwater remediation options to be considered for implementation in the event that adverse effects are detected.
- [D] Describe the nature and significance of the residual effects of the Project on groundwater quality and quantity and Total's plans to manage those effects.

### **5.3.3 Monitoring**

- [A] Describe monitoring programs proposed for the following purposes:
  - a) to monitor the sustainability of groundwater production;
  - b) to monitor the effects of dewatering; and
  - c) to identify changes to groundwater quality and quantity resulting from the Project and to measure the effectiveness of mitigation plans.

## **5.4 SURFACE WATER HYDROLOGY AND QUALITY**

### **5.4.1 Baseline Information**

- [A] Discuss baseline surface hydrology conditions, including flow regimes of watercourses in the Project Area.
- [B] Provide local and regional surface flow baseline data, including seasonal variation, low, average and peak flows for watercourses, and low, average and peak levels for waterbodies.

- [C] Describe and map drainage patterns.
- [D] Describe the baseline water quality of watercourses and waterbodies and their seasonal variations and relationships to flow and other controlling factors.
- [E] Identify any surface water users who have existing water rights.

#### 5.4.2 Impact Assessment

- [A] Identify components within each phase of the Project that may influence or impact surface water hydrology or quality.
- [B] Discuss changes to watersheds, including surface and near-surface drainage conditions, potential flow impediment, and potential changes in open-water surface areas caused by the Project.
- [C] Describe the extent of changes to surface water that will result from disturbances to groundwater and surface water movement:
  - a) include changes to the quantity of surface flow, water levels and channel regime in local watercourses (during minimum, average and peak flows) and water levels in local waterbodies;
  - b) assess the potential impact of any alterations in flow on the local and regional hydrology and identify all temporary and permanent alterations, channel realignments, disturbances or surface water withdrawals;
  - c) discuss possible water diversions and return flows from these drainage channels and waterbodies under a variety of operating conditions and scenarios including, emergency conditions, low flow, or drought conditions;
  - d) discuss the effects of site runoff management on flow/level characteristics in these drainage channels and waterbodies;
  - e) discuss both the Project and cumulative effect of these changes on hydrology (e.g., timing, volume, peak and minimum flow rates, river regime and lake levels), including the significance of effects for downstream watercourses; and
  - f) identify any potential erosion problems in the local creek channels due to proposed project activities.
- [D] Discuss changes in sedimentation patterns in receiving waters caused by construction.
- [E] Describe impacts on other users due to the Project. Identify any potential water use conflicts.
- [F] Discuss components of the Project that may potentially affect navigable waterways.
- [G] Discuss the impact of low flow conditions and in-stream flow needs (IFN) on water supply and water and wastewater management strategies.
- [H] Describe the potential impacts of the Project on surface water quality:
  - a) discuss any changes in water quality resulting from the Project that may indicate a potential adverse effect or exceedance of the *Surface Water Quality Guidelines for Use in Alberta* or the *Canadian Water Quality Guidelines*;
  - b) discuss the implications to aquatic resources (e.g., biota, biodiversity and habitat);
  - c) discuss seasonal variation and potential effects on surface water quality;
  - d) assess the potential project-related and cumulative impacts of acidifying and other air emissions on surface water quality; and
  - e) discuss the effect of changes in surface runoff or groundwater discharge on water quality in surface waterbodies.

- [I] Describe mitigation measures to maintain surface water quality and to address negative impacts during the life of the Project including the following:
  - a) potential impacts on local and regional hydrology due to alteration in flow regimes;
  - b) potential impacts on navigable waterways;
  - c) potential water use conflicts; and
  - d) increased sediment loadings due to erosion of local creek channels.
- [J] Describe nature and significance of residual effects of the Project on surface water hydrology and quality and Total's plans to manage those effects.

### **5.4.3 Monitoring**

- [A] Describe follow-up monitoring programs to address the following:
  - a) early detection of potential contamination and assistance in remediation planning;
  - b) to identify hydrological impacts;
  - c) to assess the impacts of changes in surface water flows and levels on aquatic resources, wildlife and vegetation; and
  - d) to measure the effectiveness of mitigation plans.

## **5.5 AQUATIC RESOURCES**

### **5.5.1 Baseline Information**

- [A] Describe the existing fish and other aquatic resources (e.g., benthic invertebrates and algae) in the Study Area. Identify species composition, distribution, relative abundance, movements and general life history parameters.
- [B] Describe and map, as appropriate, the fish habitat and aquatic resources of the lakes, rivers and other waters likely to be affected by the Project:
  - a) identify key indicator species and provide the rationale and selection criteria used;
  - b) identify critical or sensitive areas such as spawning, rearing, and over-wintering habitats. Discuss seasonal habitat capability and use including migration and spawning; and
  - c) the use of the fish resources as existing or potential aboriginal, sport or commercial fisheries.

### **5.5.2 Impact Assessment**

- [A] Identify components of the Project, including water withdrawals, effluent releases and acidifying and other air emissions, that may affect aquatic resources.
- [B] Describe the potential impacts to aquatic resources in watercourses and waterbodies (e.g., stream alterations and changes to substrate conditions, water quality and quantity affecting fish, fish habitat, and other aquatic resources):
  - a) consider fish tainting, survival of eggs and fry, chronic or acute health effects, and increased stress on fish populations from release of contaminants, sedimentation, flow alterations, temperature and habitat changes;
  - b) potential impacts on riparian areas that could impact aquatic biological resources and productivity;
  - c) discuss the potential for nutrient enrichment if nutrients are discharged to the aquatic environment from both the project and cumulative perspectives; and
  - d) identify residual impacts on fish, fish habitat, and other aquatic resources and discuss their significance in the context of local and regional fisheries. Identify plans proposed to offset any loss in the productivity of fish habitats. Indicate how environmental protection

plans address applicable provincial and federal policies on fish habitat including the development of a “No Net Loss” fish habitat objective.

- [C] Discuss mitigation strategies and the design, construction and operational factors to be incorporated into the Project to minimize effects to fish and fish habitat and protect aquatic resources.
- [D] Describe the nature and significance of residual effects of the Project on aquatic resources and Total’s plans to manage those effects.

### **5.5.3 Monitoring**

- [A] Describe programs that may be proposed to monitor the quality of aquatic resources and habitat and the effectiveness of mitigation strategies.

## **5.6 VEGETATION**

### **5.6.1 Baseline Information**

- [A] Map and describe the existing terrestrial, wetland and aquatic vegetation. Include any rare vascular and non-vascular plant species and rare plant communities in the Local Study Area.
- [B] Identify and verify the relative abundance of species of rare plants or endangered species, as listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Alberta Natural Heritage Information Centre (ANHIC), and the ecosite phases where they are found.

### **5.6.2 Impact Assessment**

- [A] Identify the amount of vegetation and wetlands to be disturbed during each phase of Project development.
- [B] Describe and assess potential impacts of the project construction and operation on vegetation and wetlands (abundance, diversity, health, rare species and rare plant communities) in the Study Area.
- [C] Describe measures to be implemented to mitigate potential impacts of the Project on vegetation and wetlands in the Study Area.

### **5.6.3 Monitoring**

- [A] Describe monitoring programs that may be proposed to assess vegetation and wetland impacts from the Project and the success of mitigation measures.

## **5.7 WILDLIFE**

### **5.7.1 Baseline Information**

- [A] Describe existing wildlife resources (amphibians, reptiles, birds and terrestrial and aquatic mammals), their use and potential use of habitats in the Study Area.
- [B] Identify key indicator species. Identify composition, distribution, relative abundance, seasonal movements, movement corridors, habitat requirements, key habitat areas, and general life history in the Study Area. Address those species listed by Alberta Sustainable Resource Development (at risk, may be at risk and sensitive species) and COSEWIC (endangered, threatened and vulnerable species).
- [C] Discuss any existing wildlife studies that may be occurring in the Study Area.

### **5.7.2 Impact Assessment**

- [A] Discuss the anticipated changes to wildlife as follows:

- a) describe potential impacts of the Project on wildlife species, including impacts on critical habitat, habitat availability and quality;
- b) describe potential contributions of the Project to regional effects including habitat fragmentation and loss;
- c) discuss proposed strategies to minimize and/or mitigate impacts on the species and their habitats; and
- d) describe nature and significance of the residual effects of the Project on wildlife and wildlife habitat and Total's plans to manage those effects.

### **5.7.3 Monitoring**

- [A] Describe proposed monitoring programs that will be implemented during the life of the Project to evaluate the effectiveness of mitigation strategies to reduce impacts on wildlife and their habitats.

## **5.8 BIODIVERSITY AND FRAGMENTATION**

### **5.8.1 Baseline Information**

- [A] Describe the metrics that will be used to assess biodiversity in terrestrial and aquatic ecosystems, and:
- a) describe the process and rationale used to select biotic and abiotic indicators for biodiversity within selected taxonomic groups and determine the relative abundance of species in each ecological unit (e.g., ecosite phase). Provide species lists and summaries of observed and estimated species richness and evenness for each ecosite phase;
  - b) provide a measure of biodiversity on baseline sites that are representative of the proposed reclamation ecosites; and
  - c) rank each ecological unit for biodiversity potential by combining measures of species richness, overlap in species lists, significance of individual species or associations, uniqueness and other appropriate measures. Describe the techniques used in the ranking process.
- [B] Describe the current level of habitat fragmentation for the Study Area.

### **5.8.2 Impact Assessment**

- [A] Describe the metrics that will be used to assess the probable effects of project development.
- [B] Discuss the contribution of the Project to any anticipated changes in regional biodiversity and the potential impact to local and regional ecosystems.
- [C] Describe the extent of potential effects from fragmentation resulting from the Project.
- [D] Discuss the measures to minimize fragmentation and any anticipated changes in biodiversity and proposed strategies to mitigate any anticipated effects.
- [E] Describe the nature and significance of residual effects of the Project on biodiversity and fragmentation and Total's plans to manage those effects.

### **5.8.3 Monitoring**

- [A] Describe monitoring programs proposed to measure changes in biodiversity and the effects of increased fragmentation caused by the Project and the effectiveness of mitigation measures.

## **5.9 TERRAIN AND SOILS**

### **5.9.1 Baseline Information**

- [A] Describe and map the terrain and soils conditions for the Study Area, including the following:

- a) surficial geology and topography;
- b) biophysical conditions, including drainage patterns, soil and vegetation characteristics within the Local Study Area;
- c) provide an ecological context to the soil resource by supplying a soil survey report and maps to include:
  - i) Survey Intensity Level (SIL) 1 for parts of the Project Area where soil is to be disturbed, and
  - ii) SIL 2 for other areas in the Local Study Area;
- d) the pre-disturbance morphological, physical and chemical properties of the soil types and an assessment of pre-disturbance land capability.

[B] Discuss the sensitivity of soils to acidic deposition.

[C] Explain the methods used to assess sensitive soils and include information from grid cell sensitivity assessments that may be available for the Study Area.

### **5.9.2 Impact Assessment**

[A] Identify components of the Project that may affect terrain and soil resources, including topography and drainage patterns.

[B] Identify any activities associated with the Project, which may cause soil contamination or soil deterioration, including acid deposition and changes to land capability at the local and regional scale. Address the following:

- a) the amount of surface disturbance from plant and infrastructure-related activities;
- b) provide an inventory and map of the pre- and post-disturbance land capability classes for soils in the Local Study Area and describe the impacts to land capability due to the Project;
- c) the potential acidification impact on soils and, using modeled PAI, describe the soils that would exceed the Clean Air Strategic Alliance's recommended critical loads and include maps showing their spatial distribution; and
- d) potential effects of the Project on erosion-sensitive soils.

[C] Describe mitigation plans Total may implement to minimize effects on terrain and soils.

[D] Describe the nature and significance of residual effects of the Project on terrain and soils and Total's plans to manage those effects.

### **5.9.3 Monitoring**

[A] Describe programs proposed to monitor impacts due to the Project on terrain and soils and the success of mitigation.

## **5.10 LAND USE**

### **5.10.1 Baseline Information**

[A] Identify the existing land uses, including oil and gas development, agriculture, forestry, tourism, cultural use, food collection, trapping, fishing, hunting and other outdoor recreational activities.

[B] Identify unique sites or special features in the Study Area such as Natural Areas and Environmentally Significant Areas.

[C] Identify any land use policies and resource management initiatives that pertain to the Study Area, and discuss how the proposed development will be consistent with the intent of the guidelines and objectives of these initiatives.

[D] Identify Crown bed and shore.

### **5.10.2 Impact Assessment**

[A] Identify the potential impact of the Project on current land uses, including:

- a) the anticipated changes in nature, location and duration of land use as a result of the Project;
- b) impacts to unique sites or special features;
- c) potential impacts from the Project on local and regional land use management, residential areas, agricultural activities, areas with native vegetation, wildlife habitat, recreation uses, and other industrial uses in the region; and
- d) the implications of relevant land use policies and resource management initiatives for the Project, including any constraints to development.

[B] Discuss possible mitigative strategies to address the following:

- a) the process for addressing the needs of other users in the Local Study Area;
- b) measures to mitigate impacts on land use created by the Project; and
- c) compensation for disturbed Crown bed and shore.

[C] Describe the nature and significance of residual effects of the Project on land use and the measures Total proposes to manage those effects.

### **5.10.3 Monitoring**

[A] Describe programs proposed to monitor land use impacts resulting from the Project and the effectiveness of mitigation.

## **6.0 PUBLIC HEALTH AND SAFETY**

[A] Describe those aspects of the Project that may have implications for public health or the delivery of regional health services.

[B] Determine whether there may be implications for public health arising from the Project. Specifically:

- a) describe the data and methods used by Total to assess the impacts of the Project on human health and safety;
- b) assess the potential health implications of the compounds that will be released to the environment from the proposed operation in relation to exposure limits established to prevent acute and chronic adverse effects on human health;
- c) identify the potential risk to human health from potential contamination of country foods and natural food sources taking into consideration all Project activities;
- d) provide information on compounds potentially released by the Project that may be present in selected species of vegetation and wildlife known to be consumed by humans and incorporate into the assessment;
- e) discuss the potential to increase human exposure to contaminants from changes to water quality and drinking water, air quality and soil quality taking all project activities into consideration;
- f) document the health and safety concerns raised by stakeholders during consultation on the Project;
- g) assess the cumulative health effects to receptors, including Aboriginal receptors, that are likely to result from the Project in combination with other existing, approved, and planned projects or reasonably-foreseeable activities in the region;

- h) identify anticipated follow-up work, including regional cooperative studies. Identify how such work will be implemented and coordinated with ongoing air, soil, and water quality initiatives;
- i) describe potential health and safety risks due to higher regional traffic volumes and the increased risk of accidental leaks and spills;
- j) provide a summary of Total's emergency response plan and discuss mitigation plans that will be implemented to ensure workforce and public safety during pre-construction, construction, operation, decommissioning and reclamation of the Project. Include prevention and safety measures for wildfire occurrences, water-saturated plumes from the cooling towers, icy roads in winter months, accidental release or spill of chemicals to the environment and failures of structures retaining water or fluid wastes;
- k) describe how local residents will be contacted during an emergency and what type of information will be communicated to them;
- l) describe existing agreements with area municipalities or industry groups such as, safety co-operatives, emergency response associations and municipal emergency response agencies; and
- m) document any health concerns identified by Aboriginal stakeholders due to the impacts of existing industrial development and of the Project, specifically on their traditional lifestyle. Determine the impact of the Project on the health of Aboriginal stakeholders and identify possible mitigation strategies.

## **7.0 HISTORIC RESOURCES**

- [A] Provide evidence of consultation with Alberta Tourism, Parks, Recreation and Culture. Provide a general overview of the results of any previous historic resource studies that have been conducted in the Study Area, including archaeological resources, palaeontological resources, historic period sites, and any other historic resources as defined within the *Historical Resources Act*.
- [B] Provide a summary of the results of any Historic Resources Impact Assessments that have been carried out with respect to the Project. The Historic Resources Impact Assessment(s) must encompass all projected development and impact areas.
- [C] Provide an outline of the historic resources management program and schedule of field investigations that Total may be required to undertake to mitigate the effects of the Project on historic resources.

## **8.0 SOCIO-ECONOMIC ASSESSMENT**

### **8.1.1 Baseline Information**

- [A] Describe the existing socio-economic conditions in the region.
- [B] Describe factors that may affect existing socio-economic conditions including:
  - a) Total's policies and programs regarding the use of regional and Alberta goods and services;
  - b) a general description of the overall engineering and contracting plan for the Project;
  - c) a breakdown of the labour force, type of employment, and number of employees with respect for the construction and operational workforces. Identify when the peaks in labour requirements will occur, the extent of the peaks and the source of labour for the Project;
  - d) local business development opportunities the Project may create; and
  - e) planned accommodations for the workforce during construction and operations.

### **8.1.2 Impact Assessment**

[A] Describe the socio-economic effects of the Project, including:

- a) impacts on the communities of the region and on Alberta including:
  - i) local employment and training,
  - ii) local procurement,
  - iii) population changes,
  - iv) housing concerns in local communities,
  - v) other recreational activities,
  - vi) trapping, hunting and fishing,
  - vii) effects on First Nations and Métis, and
  - viii) regional and provincial economic benefits;
- b) estimated industrial benefits including Alberta, other Canadian, and non-Canadian percentages of total project cost for engineering and project management, equipment and materials, construction labour and total overall project;
- c) impacts of the proposed Project on the availability of affordable housing and the quality of health care services;
- d) impacts on the transportation network, including the road leading to Project Area;
- e) the impact on local and regional infrastructure and community services, taking into consideration other projects that are reasonably anticipated during the life of the Project; and
- f) impacts of the Project's energy and infrastructure requirements and associated infrastructure on area residents and businesses.

[B] Discuss options for mitigating impacts including:

- a) plans to work with local residents and businesses with regards to employment, training needs, and other economic development opportunities arising from the construction and operation of the Project;
- b) plans to minimize impacts on area residents and businesses;
- c) measures that could be undertaken to address potential impacts on the availability of affordable housing and the quality of health care services; and
- d) strategies to mitigate socio-economic concerns raised by local municipalities, Regional Health Authorities and other stakeholders in the region.

[C] Describe the nature and significance of residual effects of the Project on socio-economic conditions and Total's plans to manage those effects.

### **8.1.3 Monitoring**

[A] Discuss monitoring plans proposed to measure the success of mitigation.