Public Comments on the Suncor Energy Inc. Meadow Creek West Proposed Terms of Reference

February 27, 2017

Melanie Daneluk

From: Britta Eriksson <beriksson@raeandcompany.com>
Sent: Monday, February 27, 2017 2:59 PM
To: AEREnvironmental Assessment; tshepherd@suncor.com
Cc: Douglas Rae; Lee Carter
Subject: Suncor Meadow Creek West; comments on Proposed Terms of Reference
Attachments: Chard comment PToR 2017-02-27.pdf

Dear Director,

Please see the attached comments on behalf of Chard Metis Society and Chard Metis Dene Inc.

Regards,

Britta

Britta Eriksson | Head, Litigation Support

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Our File: 4302

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File No.: 4302
VIA EMAIL
AEREnvironmental.Assessment@aer.ca
tshepherd@suncor.com

February 27, 2017

Alberta Energy Regulator
Authorization Branch
1000, 250 – 5th Street SW
Calgary, AB T2P 0R4

ATTENTION: DIRECTOR, ENVIRONMENTAL ASSESSMENT

Suncor Energy Inc.
150 – 6th Avenue SW
Calgary, AB T2P 3E3

ATTENTION: TRAVIS SHEPHERD, SENIOR ADVISOR, ENVIRONMENT

Re: Proposed Terms of Reference for Environmental Impact Assessment
Suncor Energy Inc. – Meadow Creek West Project

We represent the Chard Metis Society and Chard Metis Dene Inc. (collectively the "Chard Metis"), who should now be recognized as a First Nation, not just another stakeholder, as a result of the Supreme Court of Canada's decision in *Daniels v. Canada (Indian Affairs and Northern Development)*, 2016 SCC 12.

The Environmental Impact Assessment ("EIA") should be carried out in accordance with Article 19 of the *United Nations Declaration on the Rights of Indigenous Peoples*, which declares:

> "States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them."

Further, the EIA must include anticipated improvements in technology that will result in greater efficiencies and lower Greenhouse Gas emissions, together with the consequences if these technological improvements are not realized.

The Chard Metis draw attention to the following deficiencies in the Propose Terms of Reference and would appreciate further information in their regard:

1. With respect to "adaptive management", describe the consequences of failing to utilize such an approach in Suncor's previous oil sands projects, including the consequences of this failure on Indigenous communities;

2. Describe what percentage of the total "economic rents" realized from the project will accrue to the Chard Metis;

3. Outline details with respect to the management of groundwater, as separate but equally important as water supply, surface water, and wastewater management;

4. Describe how the Chard Metis will be compensated for their loss of Aboriginal rights;

5. How will the proprietary rights of the Chard Metis to Traditional Ecological Knowledge and Land Use outlined in section 5 be protected;

6. Describe how Suncor will remedy the situation of the Chard Metis work opportunities are not realized, either due to competitive, lower bids or for other reasons;

7. Describe the sole source of contracts that will be awarded the Chard Metis; and

8. Quantify the number of Chard Metis monitors that will be hired during both the construction phase and post-construction phase.

Communications in regard to Chard Metis comments on the Proposed Terms of Reference for Environmental Impact Assessment can be directed to the following address:

Rae and Company
900, 1000 – 5 Avenue SW
Calgary AB T2P 4V1
Attention: L. Douglas Rae
T: 403.264.8389
F: 403.264.8399
E: lorddoug@raeandcompany.com

with copies by email to Margaret Caine at mcaine.chardmetisdene@gmail.com and Pam Herman at pherman.chardmetisdene@gmail.com.

The Chard Metis submit that the foregoing comments and believe that present consultation initiatives favour industrial projects instead of their people.

Yours truly,

Rae and Company

for L. Douglas Rae
LDR/ble

cc. Raoul Montgrand, Chard Metis (via email)
Margaret Caine (via email)
Pam Herman (via email)

Melanie Daneluk

From: Eddison Lee Johnson <elj@mckaymetis.com>
Sent: Monday, February 27, 2017 6:43 PM
To: AEP Environmental Assessment; Melanie Daneluk; AEREnvironmental Assessment
Cc: 'Shepherd, Travis'; Melody Nice; elj@mckaymetis.com; ARC Team
Subject: Suncor Energy Meadow Creek West SAGD Proposed ToR
Attachments: MeadowCreek-PTORPublicNotice-Jan02-2017.pdf; MeadowCreek-ProposedTOR-Nov07-2016_ Fort McKay Metis Community Review & Comments.pdf; Final Meadow Creek West SADG Project Proposed TOR_Fort McKay Metis Community Submission.pdf

Re: Fort McKay Metis Community (Local#63) Comments on Meadow Creek West In-situ Project Proposed Terms of Reference for the Environmental Impact Assessment

The Fort McKay Sustainability Centre is writing to you on behalf of the Fort McKay Metis Community Association (Fort McKay Metis Local#63) regarding Suncor Energy Inc's proposed Meadow Creek West In-situ Project. The Project is located:

- within Fort McKay Metis' Powley designated Traditional & Hunting Territory;
- Southeast of the Community of Fort McKay

As the AE&P is aware, Fort McKay Metis has lost use of, or access to, much of its intensely used Traditional Territory, significantly and this has adversely affecting its members' ability to exercise their aboriginal rights. Further infringement raises significant concern within Fort McKay Community as more and more land is taken up. It is also likely that this project and related development will lead to adverse effects, such as decreased wildlife, increased air pollution and odours, reduced water quality, noise, traffic, and other land use conflict and competition. Hence, this project is of interest and concern to Fort McKay members.

Please find attached, Fort McKay Metis' requested revisions to Suncor Energy Meadow Creek West's draft Terms of Reference (ToR). We have made our comments in 'track changes' and 'comments' in Word.

The following are some of the key issues that we have identified in our review of ToR and request that these be addressed in the final ToR.

Scope of the Assessment

Fort McKay requests that any access road and other utilities (e.g. pipelines, transmission lines) proposed for this project to be included in the scope of the environmental assessment and the cumulative effects assessment.

Assessment Project-specific and Cumulative Effects on the Ability of Fort McKay to Exercise Aboriginal Rights

In order to help Fort McKay Metis understand and assess the potential impacts of the Meadow Creek West Project on the Community, and on our Traditional and Hunting Territory, we request specific requirements within the EIA terms of reference to:

- Assess and determine the significance of the project effects and cumulative effects, on Fort McKay Metis'
  - opportunities for use of lands and resources for traditional purposes;
  - cultural heritage; and
  - on the ability to exercise aboriginal rights.
- Describe the consultation with aboriginal communities and the mitigation measures that are planned to prevent and minimize impacts on traditional use and resources within Fort McKay's Traditional and Hunting Territory.

Assessment Cases

As AE&P is aware, Fort McKay has requested in the past and requests for this EIA, the use of a pre-development (approximately mid-1960s) and a current (approximately 2017) assessment case. Fort McKay Metis and First Nation conducted the Fort McKay Specific Assessment in 2010, which showed that a pre-development and current case that the use of these assessment cases provides essential and meaningful assessment information to determine the effects of a project and cumulative developments on resources of interest to Fort McKay Metis Community embers, on traditional land use opportunities, cultural heritage and Fort McKay Metis's ability to exercise aboriginal rights.

We note that there is no specific discussion of assessment cases in the proposed EIA ToR and since it is covered in AE&Ps Guide to Preparing Environmental Impact Assessment Reports in Alberta (Updated August 2010), which does not specify a pre-development and current case.
Fort McKay Metis requests that that a pre-development and current case be required for the Meadow Creek West EIA and all EIAs within the region.
Assessment and Selection of Mitigation Options
Fort McKay Metis requires information on how Suncor will make best efforts to minimize air, water and land impacts. This information is required as part of the "contents of EIA report" as per EPEA legislation. This requires that Suncor provide an assessment of the options available to minimize these impacts and their rationale for choosing the option or strategy proposed. Without this information the Community will not be in a position to determine whether or not the project is acceptable. In this regard our proposed 'tracked changes' to the ToR in the attached file reflect the type of information required by the Community.
AENV Consultation with Fort McKay
Fort McKay Metis requests consultation with AE&P regarding the ToR and other aspects of the environmental assessment of the Suncor Energy Meadow Creek West Project, including options for mitigation and accommodation.
Summary
We appreciate the opportunity to review and provide comments on these ToR. Fort McKay Metis requests that Alberta Environment and Parks and Alberta Energy Regulator respond to the proposed revisions noting what was incorporated and additionally, if revision were not incorporated, provide rationale as to why. If you would like to discuss this further, please contact me.

Sincerely,

Eddison Lee-Johnson P.Ag., EP, MRICS
Director
Fort McKay Sustainability Centre

Cc: Fort McKay Metis President and Board members
Adi Adiele Senior Environmental & Regulatory Coordinator, FMMSC
Melanie Daneluk, Registrar of Environmental Assessment, EP&A
Travis Shepard, Senior Advisor, Environment, Suncor

February 26,2017

Director, Environmental Assessment, Regional Integration
Environment and Parks
2nd fl Petroleum Plaza ST
9915 - 108 Street
Edmonton, AB
T5K 2G8

e-mail: environmental.assessment@gov.ab.ca
melanie.daneluk@gov.ab.ca
AEREnvironmental.Assessment@AER.ca

Attention: Manager, Environmental Assessment

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Eddison Lee-Johnson P.Ag., EP, MRICS
Director
Fort McKay Sustainability Centre

Cc: Fort McKay Metis President and Board members
Adi Adiele Senior Environmental & Regulatory Coordinator, FMMSC
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Travis Shepard, Senior Advisor, Environment, Suncor

Fort McKay Metis Community (Local#63) Edits
Submitted by: McKay Metis Sustainability Centre (MMSC)

TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR SUNCOR ENERGY INC's PROPOSED

MEADOW CREEK WEST IN-SITU PROJECT

Approximately 33 km west of Anzac, Alberta

ISSUED BY: **Suncor Energy Inc.**
150 6th Avenue S.W., Calgary, Alberta T2P 3E3

DATE: **November 7, 2016**

TABLE OF CONTENTS

PURPOSE OF THE TERMS OF REFERENCE

The purpose of this document is to identify for Suncor Energy Inc. (Suncor), Indigenous communities and appropriate stakeholders the information required by government agencies for an Environmental Impact Assessment (EIA) report prepared under the *Environmental Protection and Enhancement Act* (EPEA) for the Meadow Creek West Project (the Project).

Suncor is seeking approval to develop the proposed Project within portions of Townships 84 and 85, Ranges 9, 10, 11 and 12, W4M, located about 33 km west of the town of Anzac and about 38 km south of the city of Fort McMurray. The Project is owned by Suncor (75% operating interest) and Nexen Energy ULC (25%). The Project will use in situ technologies for extraction of bitumen from the McMurray formation.

The Project is expected to produce 40,000 barrels of bitumen per day (bpd) from one central processing facility (CPF) for 25 to 40 years. Project components will include steam generation including natural gas-fired cogeneration, water treatment and recycling, bitumen treatment, multi-well production pads, steam delivery pipelines, product recovery pipelines, local access roads, and borrow pits. The Project will be accessed from Highway 63. Pending regulatory approval, Suncor is planning to construct the project in a single phase beginning in 2022 with first oil in 2025.

SCOPE OF THE EIA REPORT

Suncor shall prepare and submit an EIA report that examines the environmental and socio-economic effects of the Project and associated access road and other infrastructure (e.g. pipelines, transmission lines).

Comment [F1]: Fort McKay Metis considered a Project and its ancillary units like roads, pipelines important infrastructure for assessing to understand the cumulative impact of the project. Suncor should provide sufficient details to o inform review i.e. proposed route, environmental assessment of the routes, consultation regarding the road, pipeline, etc.

The EIA report shall be prepared considering all applicable provincial and federal legislation, codes of practice, guidelines, standards, policies and directives.

The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under EPEA and associated regulations, and the *Canadian Environmental Assessment Act* if applicable. The EIA report will form part of Suncor's application to the Alberta Energy Regulator (AER). An EIA report summary will also be included as part of the AER Application.

Suncor shall refer to the *Guide to Preparing Environmental Impact Assessment Reports in Alberta* published by Alberta Environment and Parks (the Guide) and these Terms of Reference when preparing the Environmental Impact Assessment report. In any case where there is a difference in requirements between the Guide and these Terms of Reference, the Terms of Reference shall take precedence.

The scope of the environmental assessment must include, the Project and the access road and utilities infrastructure (pipelines, transmission lines) including an assessment of direct, induced effects and cumulative effects of the access road and the Project.

CONTENT OF THE EIA REPORT

1 PUBLIC ENGAGEMENT AND INDIGENOUSCONSULTATION

[A] Describe the concerns and issues expressed by the public and the actions taken to address those concerns and issues, including how public input was incorporated into the Project development, impact mitigation and monitoring.

[B] Describe the process followed to identify and contact potentially adversely impacted aboriginal communities, the concerns and issues expressed by Indigenous communities and the actions taken to address those concerns and issues, including how Indigenous community input was incorporated into the Project's design, EIA development, impact avoidance or mitigation, and monitoring and

reclamation. Describe consultation undertaken with Indigenous communities and groups with respect to Traditional Ecological Knowledge and Traditional Use of land and water and the mitigation and buffers planned for minimizing effects on traditional land use and resources within the area.

[C] Describe plans to maintain the public engagement and Indigenous consultation process following completion of the EIA and during construction, operation and reclamation report to ensure that the public and Indigenous peoples will have an appropriate forum for expressing their views on the ongoing development, operation and reclamation of the Project.

2 PROJECT DESCRIPTION

2.1 Overview

[A] Provide a brief project description in sufficient detail to provide context for the EIA, including:

a) proponent information;
b) proposed extraction and bitumen processing technology;
c) amount and source of energy required for the Project;
d) the amount and source of diluent required for extraction and transportation over the life of the Project;
e) water supply and disposal requirements, including process water and potable water requirements;
f) proposed method to transport product to markets; and
g) development plan and schedule.

[B] Provide maps and/or drawings of the Project components and activities including:

a) existing infrastructure, leases and clearings, including exploration clearings;
b) proposed central processing/treatment and field facilities;
c) other buildings and infrastructure (e.g., pipelines and utilities);
d) temporary structures;
e) transportation and access routes;
f) on-site hydrocarbon storage;
g) containment structures such as retention ponds and storage ponds (e.g., lime sludge, stormwater runoff, boiler blow-down);
h) water wells/intakes, pipelines, and storage structures;
i) sources of aggregate resources, borrow material and other construction material and locations of any stockpiles that will be developed; and
j) waste storage area and disposal sites.

[C] Discuss the implications of a delay in proceeding with the Project, or any phase of the Project, or not going ahead with the Project.

~~[C]~~[D] Discuss how environmental, socio-economic, traditional use and traditional environmental knowledge (TEK) criteria and concerns expressed during consultation with aboriginal communities influenced the evaluation of alternatives and the selection of the proposed Project.

~~[D]~~[E] Describe the benefits of the Project, including jobs created, local training, employment and business opportunities, and royalties and taxes generated that accrue to:

a) Suncor;

b) local and regional communities, including Indigenous communities;
c) the local authority;
d) Alberta; and
e) Canada.

~~[E]~~[F] Provide the adaptive management approach that will be implemented throughout the life of the Project. Include how monitoring, mitigation and evaluation will be incorporated.

2.2 Constraints

[A] Discuss the process and criteria used to identify constraints to development, and how the Project has been designed to accommodate those constraints. Include the following:

a) any applicable *Alberta Land Stewardship Act* Regional Plan, including the Lower Athabasca Regional Plan and associated management frameworks;
b) how this Project aligns with the *Comprehensive Regional Infrastructure Sustainability Plan for the Athabasca Oil Sands Area*;
c) traditional land use policies and documentation of sensitive sites or areas ideintified by Aboriginal communities and resource management initiatives that pertain to the Project;
d) provincial and federal climate change policies and legislation;
e) Indigenous traditional land and water use;
f) campgrounds and recreational sites;
g) historic resource sites;
h) all known traplines and registered fur management areas;
~~h)~~i) potential critical habitat for "at risk" and culturally important wildlife species .
~~i)~~j) the environmental setting;
~~j)~~k) cumulative environmental impacts in the region;
l) cumulative social impacts in the region;
m) water supply sources how the project's required water supply connected to the regional water supply of oil sand industry
~~k)~~n) wastewater treatment, wastewater management and wastewater disposal
~~l)~~o) results of project-specific and regional monitoring; and
~~m)~~p)potential for new or additional best available technology to increase resource recovery or reduce emissions at later times; and
q) potential for changes in the regulatory regime.
~~n)~~r) waste disposal

Comment [F2]: Proponent should commit to identify and plan to avoid wildlife habitat as early as the planning stage.

[B] Provide a detailed assessment of the selection criteria used, options considered, and rationale for selecting:

a) location of facilities and infrastructure (including linear infrastructure); and
b) thermal energy and electric power required for the Project.
~~b)~~c) how Aboriginal communities would be contacted to discuss constraint mapping of the project to address the facilities and linear infrastructure of the project and their impact to land users and aboriginal rights

[C] Provide a list of facilities for which locations will be determined later. Describe the selection criteria that will be used to determine the specific location of these facilities.

2.3 Regional and Cooperative Efforts

[A] Discuss-Suncor's involvement in regional and cooperative efforts to address environmental and socio-economic issues associated with regional development.

[B] Describe opportunities for sharing existing or planned infrastructure (e.g., access roads, utility corridors, water infrastructure) with other resource development stakeholders. Identify any potential obstacles to sharing infrastructure.

[C] In the environmental assessment, reference regional monitoring programs, management frameworks (e.g. terrestrial ecosystems management framework, NOxSOx management

frameworks and recommendations or work plans) and guidelines. Show how the project will be designed, monitored and operated to be consistent with or adhere to these guidelines.

~~[B]~~[D]

2.4 Transportation Infrastructure

[A] Prepare a Traffic Impact Assessment as per Alberta Transportation's *Traffic Impact Assessment Guideline (http://www.transportation.alberta.ca/613.htm)*. If there are any previous Traffic Impact Assessment studies that have been carried out for the Project or adjacent Projects using the same access, review and validate the findings and recommendations.

a) Describe background traffic and consider the cumulative effects of traffic impacts due to other existing and planned developments using the same highways and accesses.

b) Discuss anticipated changes to highway traffic (e.g., type, volume) due to the Project.

c) Assess potential traffic impacts for all stages of the Project (e.g., construction, operation, maintenance, expansion, shutdown).
d) Determine any necessary improvements and methods to mitigate traffic impacts.

[B] Describe and map the locations of any new road or intersection construction, or any improvements to existing roads or intersections, related to the development of the Project, from the boundary of the Project Area up to and including the highway access points, and
a) discuss the alternatives and the rationale for selection for the preferred alternative;
b) discuss compatibility of the preferred alternative to Alberta Transportation's immediate and future plans;
c) describe the impacts to local communities of the changes in transportation and infrastructure; and
d) provide a proposed schedule for the work.

e) provide a summary of consultation with aboriginal communities and registered fur management area (RFMA) holders regarding proposed roads and access management.

~~d)~~f) Identify the type, volume, location and availability of construction and reclamation materials for all road construction and road improvement work, related to the development of the Project, within and outside of the Project Area.

[C] Describe any infrastructure or activity that could have a potential impact on existing roads (e.g., pipelines or utilities crossing provincial highways, any facilities in close proximity of the highways, any smoke, dust, noise, light or precipitation generated by the Project that could impact the highway and road users).

[D] Provide a summary of any discussions with Alberta Transportation and Aboriginal communities in regards to the Project and its traffic impacts.

2.5 Air Emissions Management

[A] Discuss the selection criteria used, options considered, and rationale for selecting control technologies to minimize air emission and ensure air quality management.

[B] Provide emission profiles (type, composition/constituents, rate and source) for the Project's operating and construction emissions including point and non-point sources and fugitive emissions. Consider both normal and upset conditions. Discuss:
a) odorous and visible emissions from the proposed facilities;
b) annual and total greenhouse gas emissions during all stages of the Project. Identify the primary sources and provide calculations;
c) the intensity of greenhouse gas emissions per unit of bitumen produced;
d) the Project's contribution to total provincial and national greenhouse gas emissions on an annual basis;
e) describe the Project's greenhouse gas emissions relative to the provincial greenhouse gas emission limit for oil sands developments;
f) Suncor's overall greenhouse gas management plans;
g) amount and nature of Criteria and Trace -Air Contaminants emissions;
h) the amount and nature of acidifying and eutrophying emissions, probable deposition patterns and rates;
i) control technologies used to reduce emissions; and justification of considering the technology chosen as adequately fitting the current best available technology and criteria

~~i)~~i) conduct an odour impact assessment including identification of potential odourous emissions, dispersion and management strategies to monitor and minimize off site odour impacts

~~j)~~k) emergency flaring scenarios (e.g., frequency and duration) and proposed measures to ensure flaring events are minimized;

~~k)~~l) upset condition scenarios (e.g., frequency and duration) and proposed measures to ensure upset conditions are minimized;

~~l)~~m) gas collection and conservation, and the applicability of vapour recovery technology;

~~m)~~n) applicability of sulphur recovery, acid gas re-injection or flue gas desulphurization to reduce sulphur emissions; and

~~n)~~o) fugitive emissions control technology to detect, measure and control emissions and odours from equipment leaks.

2.6 Water Management

2.6.1 Water Supply

[A] Describe the water supply requirements for the Project, including:

a) the criteria used, options considered and rationale for selection of water supply sources(s);
b) the expected water balance during all stages of the Project. Discuss assumptions made or methods chosen to arrive at the water balances;
c) the process water, potable water, and non-potable water requirements and sources for construction (including, but not limited to, road construction, winter road construction, lease construction, production well drilling and dust suppression), camp(s) and plant site, start-up, normal and emergency operating situations, decommissioning and reclamation. Identify the volume of water to be withdrawn from each source, considering plans for wastewater reuse , including criteria and rationale for selection of water sources as described;
d) the location of sources/intakes and associated infrastructure (e.g., pipelines for water supply);
e) the variability in the amount of water required on an annual and seasonal basis as the Project is implemented;
f) the expected cumulative effects on water losses/gains resulting from the Project operations;
~~g)~~ contingency plans in the event of restrictions on the Project's water supply source (e.g., due to license conditions, source volume limitations, climate change or cumulative impact water deficits);
~~h)~~g) potable water treatment systems for all stages of the Project;
~~i)~~h) type and quantity of potable water treatment chemicals used; and
i) measures for ensuring efficient use of water including alternatives to reduce the consumption of non-saline water such as water use minimization, recycling, conservation, including criteria and rationale for selection of water sources as described; use of saline groundwater, cooperation with other operators
j) and technological improvements.

2.6.2 Surface Water

[A] Describe the surface water management strategy for all stages of the Project, including:

a) design factors considered; and
b) permanent or temporary alterations or realignments of watercourses, wetlands and other waterbodies and
~~b)~~c) mitigation measures to prevent effects on fish and fish habitat.

[B] Describe and map all roadway, pipeline, powerline and any other utility crossings of watercourses, wetlands or other waterbodies.

2.6.3 Wastewater Management

[A] Describe the wastewater management strategy, including:

a) the criteria used, options considered and rationale for the selection of wastewater treatment and wastewater disposal;

b) the source, quantity and composition of each wastewater stream from each component of the proposed operation (e.g., bitumen extraction and associated

facilities) for all project conditions, including normal, start-up, worst-case and upset conditions;

c) the proposed disposal locations and methods for each wastewater stream;

d) geologic formations for the disposal of wastewaters;

e) design of facilities that will collect, treat, store and release wastewater streams and evaluation done to determine that the facilities represent best management or treatment practices;;

f) type and quantity of chemicals used in wastewater treatment; and

g) sewage treatment and disposal.

2.7 Waste Management

[A] Discuss the selection criteria used, options considered, and rationale for waste disposal.

[B] Characterize and quantify the anticipated dangerous goods, and hazardous, non-hazardous, and recyclable wastes generated by the Project, and describe:

a) the composition and volume of specific waste streams and discuss how each stream will be managed;

b) how the disposal sites and sumps will be constructed; and

c) plans for pollution prevention, waste minimization, recycling, and management to reduce waste quantities for all stages of the Project.

[C] Describe the location of off-site disposal, including landfills and deep well disposal sites if any that are in the Regional Municipality of Wood Buffalo.

~~c)~~a)

2.8 Conservation and Reclamation

[A] Provide a conceptual conservation and reclamation plan for the Project. Describe and map as applicable:

a) current and post-development land use and how equivalent land use capability from a number of perspectives including but not limited to aboriginal traditional land use, wildlife and forest productivity (include actual measures of forest productivity not just those based on calculations from the Land Capability Classification System);

~~a)~~b) that will be achieved;

~~b)~~c) anticipated timeframes for completion of reclamation stages and release of lands back to the Crown and for Aboriginal traditional use, including an outline of the key milestone dates for reclamation and how progress to achieve these targets will be measured;

~~c)~~d) constraints to reclamation such as timing of activities, availability of reclamation materials and influence of natural processes and cycles including natural disturbance regimes;

e) a revegetation plan for the Project Are,including organic wetlands (this includes existing baseline disturbance and project-related disturbance);

f) Discuss how the proposed reclamation methods have performed in similar situations (include specific examples of successful in-situ project reclamation), including ecosite and ecosite phases diversity establishment and re-population of these areas by plant and wildlife species of importance. Include in this discussion the plants and animals included in the Aboriginal communities' traditional species lists;

~~d)~~g) ~~a~~, including ;

h) reclamation material salvage, storage areas and handling procedures, including:

i) i). describe reclamation material salvage plans, including soil resources from the entire development footprint (e.g., plant site)

j) describe the volumes of soil to be salvaged and the length of time to be stored before use; for organic soil materials, describe the expected decomposition and how this will be managed and how any volume changes will be accommodated in the reclamation plan

k) include a description of LFH depth and volume and an assessment of the potential to strip LFH separately from topsoil

l) discuss the use of a certified soil scientist to supervise soil salvage and placement; and

~~e)~~m)~~; and~~

~~f)~~n) existing and conceptual final reclaimed site drainage plans including for wetlands.

[B] Provide the expected timelines for establishment and recovery of vegetative communities and wildlife habitat and the expected differences in the resulting communities.

[C] Describe how Suncor will consider the use of progressive reclamation in project design and reclamation planning.

[D] Discuss uncertainties related to the conceptual reclamation plan.

[E]

[F] Discuss how the Suncor has consulted with and will involve Aboriginal communities in reclamation planning and monitoring.

~~[D]~~[G]

3 ENVIRONMENTAL ASSESSMENT

3.1 Air Quality, Climate and Noise

3.1.1 Baseline Information

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

a) the type and frequency of meteorological conditions that may result in poor air quality;

b) potential receptors, current regional air quality issues and trends (e.g. odours, exceedances of Ambient Air Quality Objectives; and

c) appropriate ambient air quality parameters, including SO_2, CO, H_2S, other RSCs, NOx, PAHs, VOCs, NH_3, individual hydrocarbons of concern (e.g., odours and health) in the THC and VOC mixtures, ground-level ozone (O_3), representative heavy metals and particulates (TSP, PM_{10}, and $PM_{2.5}$).

3.1.2 Impact Assessment

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

a) describe the potential for reduced air quality (including odours and visibility) resulting from the Project and discuss implications of the expected air quality for environmental protection, quality of life (example, odour) and public health;

b) discuss the design, construction and operational factors to be incorporated into the Project to comply with the AER's Directive 60 *Odour Management Protocol;*

c) provide either a 15 ug/m3 annual ave. NO2 isopleth or a 30 ug/m3 average annual NOx isopleth for the RSA with the undisturbed area within the isopleth provided

d) provide 10 ug/m3 and 15 ug/m3 annual average SO2 isopleths for the RSA with the undisturbed area within these isopleth provided

e) provide the predicted Annual 95th Percentile and 50th Percentile 1 hour concentration values for the base, application and planned development cases for SO2, NO2, PM2.5 and TRS

~~b)~~*f)*

~~c)~~g) estimate ground-level concentrations of appropriate air quality parameters;

~~d)~~h) discuss expected changes to particulate deposition, nitrogen deposition or acidic deposition patterns;

~~e)~~i) provide the expected gas-to-oil ratio, the expected concentrations of Sulphur in the produced gas and the requested Sulphur dioxide emission limit. Show calculations for the Sulphur dioxide limit including the basis for the expected parameters, factors and assumptions used;

j) identify areas that are predicted to exceed Potential Acid Input critical loading criteria;

~~f)~~k) identify nitrogen deposition rates and patterns and the areas that are expected to exceed 8 kg N/ha/year

~~g)~~l) discuss interactive effects that may occur resulting from co-exposure of a receptor to all emissions; and

~~h)~~m) describe air quality impacts resulting from the Project, and their implications for other environmental resources.

[B] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

[C] Summarize the results of the noise assessment, and:

a) identify the nearest receptor used in the assessment; and

b) discuss the design, construction and operational factors to be incorporated into the Project to comply with the AER's *Directive 38: Noise Control*, *while taking in to consideration the following*

i). ~~,~~Estimate the impacts of any pure tonal sound sources (e.g., vehicle back-up beepers) or any intermittent noise sources (e.g., steam venting) from the project

on areas in the vicinity that are used by aboriginal peoples or the public.

ii). mitigation strategies and how best practices will be applied to minimize the potential impact of the Project on air quality and noise.

~~b)~~c)

3.2 Hydrogeology

3.2.1 Baseline Information

[A] Provide an overview of the existing geologic and hydrogeologic setting from the ground surface down to, and including, the oil producing zones and disposal zones, and:

a) present regional and Project Area geology to illustrate depth, thickness and spatial extent of lithology, stratigraphic units and structural features; and

b) present regional and Project Area hydrogeology describing:

i) the major aquifers, aquitards and aquicludes (Quaternary and bedrock), their spatial distribution, properties, hydraulic connections between aquifers, hydraulic heads, gradients, groundwater flow directions and velocities. Include maps and cross sections,

ii) the chemistry of groundwater aquifers including baseline concentrations of major ions, metals and hydrocarbon indicators,

iii) the potential discharge zones, potential recharge zones and sources, areas of groundwater-surface water interaction and areas of Quaternary aquifer-bedrock groundwater interaction,
iv) water well development and groundwater use, including an inventory of groundwater users,
v) the recharge potential for Quaternary aquifers,
vi) potential hydraulic connection between bitumen production zones, deep disposal formations and other aquifers resulting from project operations,
vii) the characterization of formations chosen for deep well disposal, including chemical compatibility and containment potential, injection capacity, hydrodynamic flow regime, and water quality assessments, and
viii) the locations of major facilities associated with the Project including facilities for waste storage, treatment and disposal (e.g., deep well disposal) and describe site-specific aquifer and shallow groundwater conditions beneath these proposed facilities. Provide supporting geological information.

3.2.2 Impact Assessment

[A] Describe project components and activities that have the potential to affect groundwater resource quantity and quality at all stages of the Project.

[B] Describe the nature and significance of the potential project impacts on groundwater with respect to:

a) inter-relationship between groundwater and surface water in terms of both groundwater and surface water quantity and quality, in particular as it relates to winter stream flow in affected streams and rivers;~~;~~
b) implications for terrestrial or riparian vegetation, wildlife and aquatic resources including wetlands;
c) changes in groundwater quality, quantity and flow;
d) conflicts with other groundwater users, and proposed resolutions to these conflicts;
e) potential implications of seasonal variations and climate change,~~;~~ and
f) groundwater withdrawal for project operations, including any expected alterations in the groundwater flow regime during and following project operations.

3.3 Hydrology

3.3.1 Baseline Information

[A] Describe and map the surface hydrology in the Project Area.

[B] Identify any surface water users who have existing approvals, permits or licenses.

3.3.2 Impact Assessment

[A] Describe the extent of hydrological changes that will result from disturbances to groundwater and surface water movement, and:

a) include an assessment of the potential impact on surface water flows from potential ground heave/subsidence;
b) include changes to the quantity of surface flow, water levels and channel regime in watercourses (during minimum, average and peak flows) and water levels in waterbodies;

c) assess the potential impact of alterations in flow on the hydrology and identify all temporary and permanent alterations, channel realignments, disturbances or surface water withdrawals;
d) discuss the 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
e) identify any potential erosion problems in watercourses resulting from the Project.

[B] Describe impacts on other surface water users resulting from the Project. Identify any potential water use conflicts.

[C] Discuss the impact of low flow conditions and in-stream flow needs on water supply and water and wastewater management strategies.

3.4 Surface Water Quality

3.4.1 Baseline Information

[A] Describe the baseline water quality of watercourses and waterbodies and their seasonal variations. Consider appropriate water quality parameters, including Predevelopment (1960) and current or exiting conditions.

Assess the potential Project-related and cumulative impacts of acidifying and other contaminants in air emissions on surface water and sediment quality.

[B] Discuss the effect of changes in surface runoff and/or groundwater withdrawal on water and sediment quality in surface water bodies.

[C] Describe the effects of any water withdrawals considered, including cumulative effects on fish, fish habitat or other aquatic resources.

[D] Describe how waterbodies and areas of importance to traditional users were identified and addressed in the assessment.

[E] Discuss surface water quality issues with Aboriginal people and review existing relevant TEK and TLU information to indicate how this information has influenced the assessment process. Convey how concerns raised in these discussions will be addressed. Cross-reference with other sections in the EIA (e.g., aquatic ecology) as appropriate.

3.4.2 Impact Assessment

[A] Describe the potential impacts of the Project on surface water quality. Include consideration for thermal plumes and changes in thermally mobilized constituents.

3.5 Fisheries

3.5.1 Baseline Information

[A] Describe the pre-development and existing fish and other aquatic resources (e.g. benthic invertebrates). Identify species composition, distribution, relative abundance, movements and general life history parameters.

~~[A]~~[B] Describe and map the fish, fish habitat (e.g., aquatic and benthic invertebrates) of the lentic and lotic ecosystems, including intermittent and ephemeral water bodies. Describe the species composition, distribution, relative abundance, movements and general life history parameters, including their use and potential use of habitats. Provide the methods used and rationale for the baseline data collection.

~~[B]~~[C] Describe any species that are:

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);
b) "species at risk" identified by the *Alberta Wildlife Act* as 'Endangered', 'Threatened', or 'Species of Special Concern';
c) listed in Schedule 1 of the federal *Species at Risk Act*;
d) listed as "at risk" by COSEWIC; and
e) traditionally used species.
f) Identify the key aquatic indicators that the Proponent used to assess project impacts. Discuss the rationale for their selection.

[C] Describe TEK, as appropriate, such as fishing practices and associated ecosystem knowledge (gathered through existing reports as well as community consultation).

~~[C]~~[D] Describe and map fish habitat including critical or sensitive areas as well as habitat disturbances that are related to proposed, existing and approved projects overlain on surface hydrology.

~~[D]~~[E] Describe the current and potential use of the fish resources by Indigenous, recreational fisheries.

3.5.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to fish, fish habitat, aquatic and benthic invertebrates and key indicators, including but not limited to:

a) habitat loss and alteration;
b) potential water quality and quantity changes;
c) potential impacts on riparian areas that could affect aquatic resources and productivity;
d) changes to benthic invertebrate communities;
e) increased fishing pressures in the region that could arise from the increased human activity and improved access from the Project;
f) increased habitat fragmentation;
g) acidification;
h) groundwater-surface water interactions;
i) Potential for thermal plumes to affect aquatic habitat; and
j) potential for ground heave/subsidence to affect aquatic habitat;

[B] Discuss the rationale for the selection of the key indicators

[C] Identify proposed plans to offset any loss in the productivity as a result of the Project. Indicate how environmental protection plans address applicable provincial and federal policies on fish habitat.

[D] Describe the effects of any water withdrawals considered, including cumulative effects on fish, fish habitat and other aquatic resources.

[E] Describe the residual impacts of the Project on fish, fish habitat, and other aquatic resources and discuss their significance in the context of local and regional and aboriginal fisheries. Describe the Proponent's plans to manage those impacts.

[F] Discuss aquatic issues with Aboriginal people and review existing relevant TEK and TLU information to indicate how this information has influenced the assessment process. Convey how concerns raised in these discussions will be addressed. Cross-reference with other sections in the EIA as appropriate.

~~[C]~~[G]

3.6 Vegetation

3.6.1 Baseline Information

[A] Describe and map the vegetation communities, wetlands, rare plants, old growth forests, and communities of limited distribution. Describe the occurrence, relative abundance and distribution of all plant species providing methods used and rationale for the baseline data collection.

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);
b) "species at risk" identified by the *Alberta Wildlife Act* as 'Endangered', 'Threatened', or 'Species of Special Concern';
c) listed in Schedule 1 of the federal *Species at Risk Act*;
d) listed as "at risk" by COSEWIC; and
e) traditionally used species.
f) Describe how you will appropriately use the following resources:
    - i). Alberta Vegetation Inventory (AVI) Standard AVI 2.1,

- ii). The Field Guide to Ecosites of Northern Alberta (Beckingham and Archibald, 1996) and
- iii). the Alberta Wetland Inventory Standards Manual (AWI) Version 1.0.
-
-

g). Map the Project development footprint at a scale of 1:20,000. Conduct verification of vegetation mapping to provide reliability equivalent to the soils mapping

[B] Describe and quantify the current extent of habitat fragmentation.

3.6.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project on vegetation communities, and key indicators, including, but not limited to:

a) both temporary (include timeframe) and permanent impacts;
b) the potential for introduction and colonization of weeds and non-native invasive species;
c) potential increased fragmentation and loss of upland, riparian and wetland habitats; and

d) implications of vegetation changes for other environmental resources (e.g., terrestrial and aquatic habitat diversity and quantity, water quality and quantity, erosion potential).

[B] Provide the rationale for the selection of the key indicators.

[C] Discuss the mitigation measures to minimize impacts on vegetation communities, wetlands, rare plants, old growth forests and communities of limited distribution. Clearly identify those mitigation measures that will be implemented and provide the rationale for their selection.

[D] Discuss weeds and non-native invasive species and describe how these species will be assessed and controlled prior to and during operation and reclamation.

[E] Consult with Aboriginal peoples and review existing literature to establish relevant and meaningful Study Areas and to document TEK regarding vegetation, wetlands and traditionally used species.

~~[B]~~[F]

3.7 Wildlife

3.7.1 Baseline Information

[A] Describe and map the wildlife resources (amphibians, reptiles, birds, and terrestrial and aquatic mammals). Describe species relative abundance, distribution and their use and potential use of habitat, providing methods used and rationale for the baseline data collection.

[B] Describe any species that are"

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Parks);
b) "species at risk" identified by the *Alberta Wildlife Act* as 'Endangered', 'Threatened', or 'Species of Special Concern';
c) listed in Schedule 1 of the federal *Species at Risk Act*;
d) listed as "at risk" by COSEWIC; and
e) traditionally used Keystone species identical to Fort McKay Metis.

[C] Describe and map existing wildlife habitat and habitat disturbance including exploration activities. Identify habitat disturbances that are related to existing and approved projects.

[D] Provide rationale behind sampling protocols and field methods implemented. Include information on the number, timing and locations of surveys as well as statistical parameters (e.g., range, confidence limits, and power analyses) used to determine populations estimates. Indicate to what extent the information is based on actual survey data or hunting and trapping data, TEK, scientific peer-reviewed literature, consultant reports or modelling.

[E] Discuss data sharing agreements with other operators and how this data was incorporated into the baseline.

~~[C]~~[F] Review existing TEK documents and consult with Aboriginal peoples to ascertain information on key wildlife species and wildlife use areas

3.7.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to wildlife and wildlife habitats,

and key indicators, including, but not limited to:

a) how the Project may affect wildlife relative abundance, , mortality, movement patterns, and distribution for all stages of the Project;
b) how improved or altered access may affect wildlife, including potential obstruction of daily and seasonal movements, increased human-wildlife incidents and increased hunting pressures
c) the spatial and temporal changes to habitat availability and function (type, quality, quantity, diversity and distribution);
d) how increased habitat fragmentation may affect wildlife. Consider edge effects, the availability of core habitat and the influence of linear features and infrastructure on wildlife movements and predator-prey relationships;
e) potential effects on wildlife resulting from changes to air and water quality, including both acute and chronic effects to animal health; and
f) potential effects on wildlife from the Proponent's proposed and planned exploration, seismic and core hole activities, including monitoring/4D seismic.

[B] Discuss the rationale for the selection of the key indicators.

[C] Identify and describe wildlife models used to assess wildlife impacts;

[D] Describe wildlife models development, information sources used, model calibration, and how model predictions were verified using wildlife data from the Study Area.

[E] Comment on the availability and quality of species for traditional use considering habitat loss, habitat avoidance, vehicle-wildlife collisions, increased non-aboriginal hunting pressure and other Project related effects on wildlife populations.

[F] Discuss mitigation measures to minimize the potential impact of the Project on wildlife and wildlife habitat for all stages of the Project and to return productive wildlife habitat to the area. Clearly identify those mitigation measures, including buffers and offsets, to ensure that wildlife populations are maintained within their natural range of variability and are available for traditional use. Consider:

[G] consistency of the plan with applicable regional, provincial and federal wildlife habitat objectives and policies;

[H] a schedule for the return of habitat capability to areas impacted by the Project;

[I] the use of setbacks to protect riparian habitats and wildlife corridors, interconnectivity of such habitat and the unimpeded movement by wildlife species using that habitat;

[J] anticipated access controls or other management strategies to protect wildlife during and after Project operations;

[K] measures to prevent habituation of wildlife to minimize the potential for human-wildlife encounters and consequent destruction of wildlife, including any staff training program, fencing camps, garbage containment measures or regular follow-up;

[L] measures to mitigate habitat fragmentation considering impacts to habitat connectivity and wildlife movements resulting from linear features (e.g., above ground pipelines, roads etc.) and other Project infrastructure and activities; and

[M] measures to minimize the impacts of light on wildlife, and

[N] a Mitigation and Offset Plan that includes conservation areas to offset adverse impacts of the project on wildlife.

[O] Describe the Project's residual impacts on wildlife and wildlife habitat and the Proponent's plans to manage those impacts.

[P] Discuss wildlife issues with Aboriginal people and review existing relevant TEK and TLU information to indicate how this information has influenced the assessment process. Convey how concerns raised in these discussions will be addressed. Cross-reference with other sections in the EIA as appropriate.

~~[B]~~[Q]

3.8 Biodiversity

3.8.1 Baseline Information

[A] Describe and map the existing biodiversity, including any unique features that affect the Project area's biodiversity in comparison to the Local Study Area.

[B] Describe the changes to the Project area's biodiversity during operations and post-reclamation, and the significance of these changes in a local and regional context.

~~[A]~~[C] Identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline biodiversity. Discuss the rationale for their selection.

3.8.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to biodiversity including, but not limited to :

a) the biodiversity metrics, biotic and abiotic indicators selected;
b) the effects of fragmentation on biodiversity potential;
c) the contribution of the Project to any anticipated changes in regional biodiversity and the potential impact to local and regional ecosystems; and
d) effects during construction, operations and post-reclamation and the significance of these changes in a local and regional context.

[B] Discuss mitigation measures to minimize the potential impact of the Project on biodiversity. Clearly identify those mitigation measures that will be implemented and provide the rationale for their selection.

[C] Discuss biodiversity issues with Aboriginal people and review existing relevant TEK and TLU information to indicate how this information has influenced the assessment process. Convey how concerns raised in these discussions will be addressed. Cross-reference with other sections in the EIA as appropriate.

3.9 Terrain and Soils

3.9.1 Baseline Information

[A] Describe and map the terrain and soils conditions in the Project Area. The reliability of soil survey maps, both boundaries and map unit descriptions should be discussed.

[B] Describe and map soil types in the areas that are predicted to exceed Potential Acid Input critical loading criteria.

3.9.2 Impact Assessment

[A] Describe project activities and other related issues that could affect soil quality (e.g., compaction, contaminants) and:

a) indicate the expected amount (ha) of surface disturbance from the plant, field (e.g., pads, pipelines, access roads), aggregate and borrow sites, camps, drilling waste disposal and other infrastructure-related construction and operational activities;
b) discuss the relevance of any changes for the local and regional landscapes, biodiversity, productivity, ecological integrity, aesthetics and future use~~;~~ resulting from disturbance for all stages of the Project;
~~b)~~c) describe the effect on soils in the Local Study Area from changes to surface water flow and shallow groundwater flow;
~~c)~~d) identify the potential acidification impact on soils and discuss the significance of predicted impacts by acidifying emissions; and
~~d)~~e) describe potential sources of soil contamination.

[B] Discuss:

a) the environmental effects of proposed drilling methods on the landscape and surficial and bedrock geology;
b) the potential for changes in the ground surface during steaming and recovery operations (e.g., ground heave and/or subsidence) and their environmental implications; and

c) the potential impacts caused by the mulching and storage of woody debris considering, but not limited to, vulnerability to fire, degradation of soil quality, increased footprint.

[C] Discuss mitigation strategies to minimize the potential impact of the Project on soils or terrain.

[D] Include an assessment of soil types for reclamation suitability. Discuss reclamation material salvage, storage areas and handling procedures.

[E] Provide a mitigation plan to:

a) minimize surface disturbance including the use of existing clearings for the Project;
b) address potential effects of acid deposition;
c) mitigate changes to ground surface (temperature, heave and subsidence) during operations; and
d) address impacts to land capability including for traditional uses, wildlife and forest productivity.

~~[C]~~[F] Discuss soil and terrain issues with Aboriginal people and review existing relevant TEK and TLU information to indicate how this information has influenced the assessment process. Convey how concerns raised in these discussions will be addressed. Cross-reference with other sections in the EIA as appropriate.

3.10 Land Use and Management

3.10.1 Baseline Information

[A] Describe and map the current land uses in the Project Area, including all Crown land dispositions and Crown Reservations (Holding Reservation, Protective Notation, Consultative Notation).

[B] If known, indicate where Crown land dispositions may be needed for roads or other infrastructure for the Project

[C] Identify and map unique sites or special features such as Parks and Protected Areas, Heritage Rivers, Historic Sites, Environmentally Significant Areas, culturally significant sites and other designations (e.g., World Heritage Sites, Ramsar Sites, Internationally Important Bird Areas).

[D] Describe and map known land clearing activities, showing the timing of the activities.

[E] Describe the status of timber harvesting arrangements.

[F] Describe existing access control measures.

3.10.2 Impact Assessment

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

a) unique sites or special features;
b) traplines and registered fur management areas;
c) changes in public access arising from linear development, including secondary effects related to increased hunter, angler and other recreational access;
d) aggregate reserves that may be located on land under the Proponent's control and reserves in the region;
e) development and reclamation on commercial forest harvesting and fire management in the Project Area;
f) the amount of commercial and non-commercial forest land base that will be disturbed by the Project, including the Timber Productivity Ratings for the Project Area. Compare the baseline and reclaimed percentages and distribution of all forested communities in the Project Area;
g) how the Project impacts Annual Allowable Cuts and quotas within the Forest Management Agreement area;
h) the operation of any agricultural crown land and provincial grazing reserves;
i) anticipated changes (type and extent) to the topography, elevation and drainage patterns within the Project Area; and
j) access control for public, regional recreational activities, Indigenous land use and other land uses during and after development activities.

[B] Describe how Integrated Land Management will be considered (e.g., sharing of infrastructure, access requirements).

[C] Provide a wildfire control plan highlighting:

a) measures taken to ensure continued access for firefighters to adjacent wildland areas;
b) forest fire prevention, detection, reporting, and suppression measures, including proposed wildfire equipment;
c) measures for determining the clearing width of power line rights-of-way; and
d) required mitigation measures based on the *FireSmart Field Guide for the Upstream Oil and Gas Industry*.

4 HISTORICAL RESOURCES

4.1 Baseline Information

[A] Provide a brief overview of the regional historical resources setting including a discussion of the relevant archaeological, historic and palaeontological records.

[B] Describe and map known historical resources sites in the Project Area, considering:
a) site type and assigned Historic Resources Values; and
b) existing site specific *Historical Resources Act* requirements.

[C] Provide an overview of previous Historical Resources Impact Assessments that have been conducted within the Project Area, and for the project, including:
a) a description of the spatial extent of previous assessment relative to the Project Area, noting any assessment gap areas; and
b) a summary of *Historical Resources Act* requirements and/or clearances that have been issued for the Project to date.

[D] Identify locations within the Project Area that are likely to contain previously unrecorded historic resources. Describe the methods used to identify these areas.

4.2 Impact Assessment

[A] Describe project components and activities that have the potential to affect historic resources at all stages of the Project.

[B] Describe the impacts of the findings of the HRIA work on Project design and scheduling.

[C] Describe any Project uncertainties arising from the need for future HRIA work.

~~[A]~~[D] Consult with Aboriginal groups regarding historical resources and Project components that may adversely impact those resources.

~~[B]~~[E] Describe the nature and magnitude of the potential project impacts on historical resources, considering:
a) effects on historic resources site integrity; and
b) implications for the interpretation of the archaeological, historic and palaeontological records.

5 TRADITIONAL ECOLOGICAL KNOWLEDGE AND LAND USE

[A] During project consultation and any specific TLU or TEK studies, provide:

[B] detailed project information to Aboriginal communities (e.g., maps containing lease boundaries, well pads, locations of other project facilities or traplines) and site visits, as applicable; and

[C] references to information gathered during consultation or interviews in a format similar to literature citations (e.g., Last Name or Participant Code and date). This will help to clearly identify information sources.

[D] The Proponent must enter into information-sharing agreements with Fort McKay Metis and Aboriginal groups whose traditional land use information and TEK they seek, recognizing that the Aboriginal group has the right to control how traditional knowledge information is used and presented. Aboriginal groups retain ownership of the information throughout the process.

[E] Traditional land use study areas should be developed in consultation with Aboriginal peoples and should take into account both the full extent of Aboriginal traditional lands and areas most valued for resource harvesting and other traditional pursuits and how these overlap with the proposed project as well as other approved and planned projects.

[F]

~~[A]~~[G] Provide:

a) a map and description of Traditional Land Use areas including fishing, hunting, trapping and nutritional, medicinal or cultural plant harvesting by affected Indigenous peoples (if the Indigenous community or group is willing to have these locations disclosed);

b) a map of cabin sites, spiritual sites, cultural sites, gravesites and other traditional use sites considered historic resources under the *Historical Resources Act* (if the Indigenous community or group is willing to have these locations disclosed), as well as traditional trails and resource activity patterns; and

c) a discussion of:

i) the availability of vegetation, fish and wildlife species for food, traditional, medicinal and cultural purposes in the identified traditional land use areas considering all project related impacts, ~~and~~

ii) a traditional land use extent description in both the Project area and the Local Study Area, including fishing, hunting, trapping, nutritional or medicinal plant harvesting, and cultural use by affected Aboriginal peoples;

iii) a quantative assessment of impacts to traditionally important wildlife species (including, but not limited to Fort McKay's cultural keystone species, and as determined in discussion with Fort McKay, other species from Fort McKay's traditional wildlife list). Include mitigation strategies to address those impacts. Cross reference this information with the Wildlife section of the EIA;

iv) a list of the culturally important plant species (including, but not limited to, Fort McKay's cultural keystone species and traditional plant species list) that will be used in reclamation and indicate the species that are currently available commercially and can be used successfully in reclamation. Cross reference this information with the Vegetation section of the EIA;

v) an assessment of the richness, abundance and vigor of culturally important species collected during project vegetation surveys and include a summary of that information in both the Vegetation and Traditional Land Use sections of the EIA. Discuss project development impacts on those species (and the ecosites that support them) as well as mitigation and reclamation strategies that will be employed to address those impacts;

vi) include a discussion of:

vii) the access to traditional lands in the Project area pre-development (1960s), currently, and during all stages of the Project

viii) the vegetation and wildlife used for traditional, food, ceremonial, medicinal and other purposes

ix) impacts to traditional lands and culture, including considering the impacts of existing development on changes to access and traditional-use patterns

x) trapper consultation and compensation

Comment [F3]: Fort McKay Metis has provided these edits expecting that there will be sufficient interval between the approval of the terms of reference and when Suncor will submit an EIA for this project. This interval should provide time for Suncor to work with Fort McKay metis on these issues identified.

i)xi) Aboriginal views on traditionally and culturally meaningful land reclamation

[B][H] access to traditional lands in the Project Area during all stages of the Project. Describe how Traditional Ecological Knowledge and Traditional Land Use information was incorporated into the Project design, EIA development, the conservation and reclamation plan (including Indigenous views on land reclamation), monitoring and mitigation.

[I] Determine the impacts of the Project on traditional, medicinal and cultural purposes and identify possible mitigation strategies.

[J] Describe how TEK and TLU information was incorporated into the Project, EIA development, the conservation and reclamation plan, monitoring and mitigation.

[K] Determine the impacts of the Project and cumulative effects on traditional land use, culture and Aboriginal treaty rights from the perspective of Aboriginal communities and identify possible mitigation strategies. Describe the results of the consultation with Aboriginal communities with respect to traditional ecological knowledge and traditional land use. Include a clear summary table of traditional land uses, project-related concerns, the Aboriginal community's recommended mitigation measures, as well as the Proponent's response to these.

[L] Describe how TEK was incorporated into the technical components of the EIA and C&R report. Cross reference sections of the EIA that address or relate to TEK (e.g., Socio-economic, Vegetation, Wildlife and Aquatic Resources) as appropriate.

~~[C]~~[M] Describe how TEK will be considered during operations, i.e., through ongoing community consultation and review of existing reports, and in the reclamation plan development. Cross reference this in the Project Descriptions and Reclamation and Close Plan sections.

6 SITE-SPECIFIC AND PROJECT-SPECIFIC ISSUES

Describe the project-specific effects of the Project and cumulative effects on the Fort McKay Metis and other Aboriignal communities/peoples, the areas adjacent to the Project and access with regard to air quality, odours, noise, surface water, water quality, groundwater, aquatic resources, visual and aesthetics, vegetation, wildlife and traditional land use, as applicable.

Assess and determine the significance of the project effects and cumulative effects, on the Community of Fort McKay, the use of lands and resources for traditional purposes and on the ability to exercise treaty and aboriginal rights.

Describe the consultation with Aboriginal communities and the mitigation measures that are planned to prevent and minimize impacts on traditional use and resources within and adjacent to the Community of Fort McKay, it reserves and within Fort McKay's Traditional Territory.

7. PUBLIC HEALTH AND SAFETY

7.1 Public Health

[A] Describe aspects of the Project that may have implications for public health or the delivery of regional health services, including information specifically related to Aboriginal communities.. Determine quantitatively whether there may be implications for public health arising from the Project.

[B] Discuss the potential for changes to water quality, air and soil quality to increase human exposure to contaminants, taking into consideration all Project activities.

[C] Identify the human health impact on country foods and natural food sources potential contamination, taking into consideration all Project activities as well as the impact they might have on opportunities and desire (resulting from perceptions

of health safety) for traditional activities.

[D] Discuss the potential for fish contamination relative to fish consumption guidelines (e.g., mercury and PAHs) as well as potential for flavour tainting and how this might affect opportunities and desire (resulting from perceptions of health safety) for traditional activities.

~~[A]~~[E]

~~[B]~~[F] Document any health concerns raised by stakeholders during consultation on the Project.

~~[C]~~[G] Document any health concerns identified by Indigenous communities or groups resulting from impacts of existing development and of the Project, specifically on their traditional lifestyle and on overall health and community wellness and~~.~~ Include an Indigenous receptor type in the assessment.

[H] Describe the potential health impacts resulting from higher regional traffic volumes and the increased risk of accidental leaks and spills, including potential impacts on traditional-use plants and animals (e.g. fish).

[I] Assess human health from an ecosystem perspective, including, but not limited to, Health Canada determinants of health, stress or risk perception.

~~[D]~~[J] Discuss mitigation strategies to minimize the potential impact of the Project on human health. .

~~5.1~~6.1 Public Safety

[A] Describe aspects of the Project that may have implications for public safety. Specifically:

a) describe the emergency response plan including public notification protocol and safety procedures to minimize adverse environmental effects, including emergency reporting procedures for spill containment and management;
b) document any safety concerns raised by stakeholders during consultation on the Project;
c) describe the spill response plans and assessment approach that would address spills, including pipeline spills, flow-to-surface events, and well head blow outs, including
d) describe how local residents will be contacted during an emergency and the type of information that will be communicated to them;
~~d)~~e) describe the probability and potential consequences and effects on the Aboriginal communities of accidents and malfunctions;
~~e)~~f) describe the existing agreements with area municipalities or industry groups such as safety cooperatives, emergency response associations, regional mutual aid programs and municipal emergency response agencies; and
~~f)~~g) describe the potential safety impacts resulting from higher regional traffic volumes.

~~6~~7 SOCIO-ECONOMIC ASSESSMENT

~~6.1~~7.1 Baseline Information

[A] Describe the existing socio-economic conditions in the region and in the communities in the region.

[B] Describe factors that may affect existing socio-economic conditions including:

a) population changes;
b) workforce requirements for all stages of the Project, including a description of when peak activity periods will occur;

Comment [F4]: There terms are very vital in assessing the impact of the project from an Aboriginal perspectives. Many of the conventional health assessment criteria do not factor these terms and therefore fall short of meeting the basic health requirements of Aboriginal peoples.

c) planned accommodations for the workforce for all stages of the Project. Discuss the rationale for their selection;
d) the Proponent's policies and programs regarding the use of local, regional and Alberta goods and services;
e) the project schedule and periods of peak employment and production; and

f) the overall engineering and contracting plan for the Project.

[C] In consultation with Aboriginal communities, provide community-specific socio-economic baseline information.

~~f)~~a)

~~6.2~~7.2 Impact Assessment

[A] Describe the effects of construction and operation of the Project on and its contribution to cumulative socio-economic effects in the region, especially as it relates to:

a) housing;
b) availability and quality of health care services;
c) local and regional infrastructure and community services;
d) recreational activities
e) traffic
f) income disparity between aboriginal and non-aboriginal peoples.
g) hunting, fishing, trapping and gathering and loss of land and access to land required to carry out traditional pursuits by Aboriginal people guaranteed under Treaty 8 and the Canadian Constitution; and
~~d)~~h) First Nations and Métis (e.g., traditional land use and social and cultural implications).

[B] Describe the socio-economic effects of any new or existing camp(s) required for the Project and identify:

a) its location and the rationale for selecting this location;
b) the number of workers it is intended to house;
c) whether the camp will service the Project only or other clients;
d) the length of time the camp will be in service;
e) describe the services that will be provided in the camp (e.g., security, recreation and leisure, medical services), including a description of the impacts on Municipal or other external services; and
f) outline the emergency services and evacuation plan that will be in place.

[C] Discuss opportunities to work with First Nation and Métis communities and groups, other local residents and businesses regarding employment, training needs and other economic development opportunities arising from the Project, including

i). Aboriginal hiring and procurement policies and programs and how the Proponent will maximize local Aboriginal works, show its increase in hiring over time;

ii). the systemic barriers that obstruct advancement in Aboriginal education, training, employment and business development and describe how the Proponent will address those barriers; and

iii). describing and providing copies of the Proponent's policies and practices that will be implemented to design, manage, monitor and evaluate the company's employment and business development opportunities for First Nation and Métis peoples in the region. .

~~[C]~~[D] Provide the estimated total project cost, including a breakdown for engineering and project management, equipment and materials, and labour for both construction and operation stages. Indicate the percentage of expenditures expected to occur in the region, within or associated with specific communities in the region (including Aboriginal

Comment [F5]: Fort McKay Metis Community expects Suncor to commit to working with each of the Aboriginal communities to include community specific Socio-economic impact information, and not just data from desktop regional socio economic data used in EIAs, which have proven to be very basic and mostly outdated.

communities), Alberta, Canada outside of Alberta, and outside of Canada.

~~7~~8 **MITIGATION MEASURES**

[A] Discuss mitigation measures planned to avoid, minimize or eliminate the potential impacts for all stages of the Project on socio-economic conditions in the region and communities, specifically including Aboriginal communities within the region..

[B] Identify the mitigation objectives for each associated impact and describe those mitigation measures that will be implemented. Provide rationale for their selection, including the effectiveness of the proposed mitigation.

~~8~~9 **RESIDUAL IMPACTS**

[A] Describe the residual impacts of the Project following implementation of Suncor's mitigation measures and Suncor's plans to manage those residual impacts.

~~9~~10 **MONITORING**

[A] Describe Suncor's current and proposed monitoring programs, including:

a) how the monitoring programs will assess project impacts and measure the effectiveness of mitigation plans. Discuss how Suncor will address project impacts identified through the monitoring program;

b) how Suncor will contribute to current and proposed regional monitoring programs;

c) monitoring performed in conjunction with other stakeholders, including Indigenous communities and groups;

d) how Aboriginal communities might be involved in monitoring programs such as through partnering with the community-based monitoring programs and ongoing dialogue about the process and results of integrating monitoring outcomes in the Suncor Adaptive Management plan and outcomes of the project

e)

~~c)~~f)

Comment [F6]: Most EIA's generalized the socio-economic situation of the region, Alberta and Canada, and fail to address the specific issues of Aboriginal communities in which the projects are located.

Comment [F7]: Again, as above, most EIA's generalized the socio-economic situation of the region, Alberta and Canada, and fail to address the specific issues of Aboriginal communities in which the projects are located.

Comment [F8]: Fort McKay Metis and Aboriginal communities are expecting a greater involvement in the monitoring, planning, participation, reporting and Adaptive outcomes of oil sands projects. Suncor needs to describe in details how their EIA will make provision for Aboriginal community's involvement in monitoring

~~d)~~g) new monitoring initiatives that may be required as a result of the Project;
~~e)~~h) regional monitoring that will be undertaken to assist in managing environmental effects and improve environmental protection strategies;
~~f)~~i) how monitoring data will be disseminated to the public, Indigenous communities or other interested parties; and
~~g)~~j) how the results of monitoring programs and publicly available monitoring information will be integrated with Suncor's environmental management system.

Melanie Daneluk

From: Jennifer Gerbrandt <regulatory@mcmurraymetis.org>
Sent: Monday, February 27, 2017 12:07 PM
To: AEREnvironmental Assessment; carolyn.bennett@parl.gc.ca; Catherine.McKenna@parl.gc.ca; Lawrence Aimoe; Hundseth, Greg
Cc: Dan Stuckless
Subject: McMurray Métis Local 1935 comments on the proposed Terms of Reference for Suncor Energy Inc.'s Meadow Cree West Project
Attachments: Letter regarding Suncor MCW Draft pTOR comments by McMuray Metis Local 1935 FINAL.pdf; Draft Proposed TOR_MeadowCreekWest_Suncor - ML1935 FINAL.pdf; Draft Proposed TOR_MeadowCreekWest_Suncor - ML1935 FINAL with Track Changes.docx

Attention: Director, Environmental Assessment Authorizations Branch AER

Please find attached:

- A letter regarding McMurray Métis Local 1935 comments on the proposed Terms of Reference for Suncor Energy Inc.'s Meadow Cree West Project.
- McMurray Métis Local 1935 comments on the proposed Terms of Reference for Suncor Energy Inc.'s Meadow Cree West Project in two formats:
  - Microsoft Word document with McMurray Métis Local 1935 changes tracked.
  - PDF clean document with McMurray Métis Local 1935 changes accepted.

I am sending this on behalf of Dan Stuckless, General Manager of McMurray Métis Local 1935.

Thank you,

MCMURRAY MÉTIS

Jenny Gerbrandt, Regulatory Affairs and Heritage Research Associate
B.A. Hons. Anthropology
M.A. Environmental Anthropology

McMurray Métis (MNA Local 1935)
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Fort McMurray, AB T9H 4P3

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Please consider the environment before printing this email.

February 27, 2017

Director, Environmental Assessment
Authorizations Branch
Alberta Energy Regulator
Suite 1000, 250 – 5th Street SW
Calgary, AB T2P 0R4
E-mail: AEREnvironmental.Assessment@aer.ca

Re: McMurray Métis Comments on Suncor Energy's Meadow Creek West Proposed Terms of Reference for the Environmental Impact Assessment

Attention: Director Environmental Assessment Authorizations Branch AER

McMurray Métis is writing you on behalf of the Métis Nation of Alberta members belonging to our organization. Suncor Energy is proposing to build and operate the Meadow Creek West Project. The Project is located:

- within McMurray Métis Traditional Territory;
- about 45 km south of Fort McMurray

As the Alberta Energy Regulator and the Government of Alberta is aware, McMurray Métis has lost use of, or access to, much of its intensely used Traditional Territory, significantly and this has adversely affecting its members' ability to exercise their Métis rights. Further infringement raises significant concern within our community as more and more land is taken up. It is also likely that this project and related development will lead to adverse effects, such as decreased wildlife, increased air pollution and odours, reduced water quality, noise, traffic, and other land use conflict and competition. Hence, this project is of interest and concern to McMurray Métis.

Please find attached, McMurray Métis requested revisions to Suncor's draft Terms of Reference (ToR). We have made our comments in 'track changes' and 'comments' in Word.

The following are some of the key issues that we have identified in our review of the ToR and we request that these be addressed in the final ToR.

Scope of the Assessment

The Government of Alberta has yet to create an off-settlement Métis Consultation Policy, and have yet to make a determination as to whether McMurray Métis can creditably assert as an organization representing rights of members who hold "Powley" Métis rights in Fort McMurray. McMurray Métis request that the proponent clearly explain how they propose to meet undertake the (procedural) aspects of consultation without clarity from the Government of Alberta and the Government of Alberta to provide in writing an update as to their position on Métis consultation with McMurray Métis.

Assessment Project-specific and Cumulative Effects on the Ability of McMurray Métis to Exercise Aboriginal Rights

For McMurray Métis to understand and assess the potential impacts of Project on the Community, and on our Traditional Territory, we request specific requirements within the EIA terms of reference to:

- Assess and determine the significance of the project effects and cumulative effects, on McMurray Métis'
  - opportunities for use of lands and resources for traditional purposes;
  - cultural heritage; and
  - on the ability to exercise Métis rights.
- Describe the consultation with aboriginal communities and the mitigation measures that are planned to prevent and minimize impacts on traditional use and resources within McMurray Métis' Traditional Territory.

Assessment Cases

As ESRD is aware, McMurray Métis (along with many other Indigenous communities) has requested in the past and requests for this EIA, the use of a pre-development (approximately mid-1960s) and a current (approximately 2017) assessment case. McMurray Métis conducted the Teck Cultural Impact Assessment in 2015, which showed that a pre-development and current case that the use of these assessment cases provides essential and meaningful assessment information to determine the cultural effects of a project and cumulative developments on resources of interest to McMurray Métis, on traditional land use opportunities, cultural heritage and McMurray Métis ability to practice Métis rights. While this study was project specific, and additional work needs to be completed to include in the assessment potential environmental impacts to McMurray Métis, it provides a possible template to understanding the full scope of impacts to the community.

We note that there is no specific discussion of assessment cases in the proposed EIA ToR and since it is covered in AENV's Guide to Preparing Environmental Impact

Assessment Reports in Alberta (Updated March 2013), which does not specify a pre-development and current case.

McMurray Métis requests that that a pre-development and current case be required for the Meadow Creek West EIA and all EIAs within the region.

Assessment and Selection of Mitigation Options
McMurray Métis requires information on how Suncor will make best efforts to minimize air, water and land impacts. This information is required as part of the "contents of EIA report" as per *EPEA* legislation. This requires that Suncor provide an assessment of the options available to minimize these impacts and their rationale for choosing the option or strategy proposed. Without this information the Community will not be in a position to determine whether or not the project is acceptable. In this regard our proposed 'tracked changes' to the ToR in the attached file reflect the type of information required by McMurray Métis.

AEP Consultation with McMurray Métis
McMurray Métis requests consultation with AEP and IR regarding the ToR and other aspects of the environmental assessment of the Meadow Creek West Project, including options for mitigation and accommodation.

Summary
We appreciate the opportunity to review and provide comments on these ToR. McMurray Métis requests that Alberta Environment and Parks respond to the proposed revisions noting what was incorporated and additionally, if revisions were not incorporated, provide rationale as to why. If you would like to discuss this further, please contact me.

Sincerely,

Daniel Stuckless

_____
Dan Stuckless, General Manager McMurray Métis Local 1935

Cc: Minister Bennett
Minister McKenna
Lawrence Aimoe
Greg Hundseth
MNA Region 1 Presidents

Métis Nation of Alberta Association Fort McMurray Local Council 1935
441 Sakitawaw Trail, Fort McMurray, AB, T9H 4P3
P: 780-743-2659 | F: 780-791-2654
E: Metis1935@FortMcMurrayMetis.org | T: McMurrayMetis | W: www.FortMcMurrayMetis.org

TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR SUNCOR ENERGY INC's PROPOSED

Meadow Creek West In-Situ PROJECT

Approximately 33 km west of Anzac, Alberta

ISSUED BY: **Suncor Energy Inc.**
150 6th Avenue S.W., Calgary, Alberta T2P 3E3

DATE:

TABLE OF CONTENTS

PURPOSE OF THE TERMS OF REFERENCE

The purpose of this document is to identify for Suncor Energy Inc. (Suncor), Aboriginal communities and appropriate stakeholders the information required by government agencies for an Environmental Impact Assessment (EIA) report prepared under the *Environmental Protection and Enhancement Act* (EPEA) for the Meadow Creek West Project (the Project).

Suncor is seeking approval to develop the proposed Project within portions of Townships 84 and 85, Ranges 9, 10, 11 and 12, W4M, located about 33 km west of the town of Anzac and about 38 km south of the city of Fort McMurray. The Project is owned by Suncor (75% operating interest) and Nexen Energy ULC (25%). The Project will use in situ technologies for extraction of bitumen from the McMurray formation.

The Project is expected to produce 40,000 barrels of bitumen per day (bpd) from one central processing facility (CPF) for 25 to 40 years. Project components will include steam generation including natural gas-fired cogeneration, water treatment and recycling, bitumen treatment, multi-well production pads, steam delivery pipelines, product recovery pipelines, local access roads, and borrow pits. The Project will be accessed from Highway 63. Pending regulatory approval, Suncor is planning to construct the project in a single phase beginning in 2022 with first oil in 2025.

SCOPE OF THE EIA REPORT

Suncor shall prepare and submit an EIA report that examines the cultural, environmental and socio-economic effects of the Project.

The EIA report shall be prepared considering all applicable provincial and federal legislation, codes of practice, guidelines, standards, policies and directives. This should include consideration of all Indigenous rights that may be impacted by the project and the Government of Alberta and Canada's commitment to implementing the United Nations Declaration on the Rights of Indigenous People (UNDRIP), the Truth and Reconciliation Commission of Canada (TRC) and rights protected under section 35 of the Canadian Constitution (s.35).

The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under EPEA and associated regulations, and the *Canadian Environmental Assessment Act* including an assessment as to whether Alberta consultation processes effectively meet the duty to consult with Métis communities. The EIA report will form part of Suncor's application to the Alberta Energy Regulator (AER). An EIA report summary will also be included as part of the AER Application.

Suncor shall refer to the *Guide to Preparing Environmental Impact Assessment Reports in Alberta* published by Alberta Environment and Parks (the Guide) and these Terms of Reference when preparing the Environmental Impact Assessment report. In any case where there is a difference in requirements between the Guide and these Terms of Reference, the Terms of Reference shall take precedence.

CONTENT OF THE EIA REPORT

1 PUBLIC ENGAGEMENT AND INDIGENOUS CONSULTATION

[A] Describe the concerns and issues expressed by the public and the actions taken to address those concerns and issues, including how public input was incorporated into the Project development, impact mitigation and monitoring.

[B] Describe the concerns and issues expressed by Aboriginal communities and the actions taken to address those concerns and issues, including how Aboriginal community input and traditional knowledge was specifically incorporated into the Project, EIA development, mitigation, monitoring and reclamation. Describe your approach to consultation with Aboriginal communities with respect to, traditional knowledge and traditional use of land, water and air, and how you plan to use information shared to develop a better project.

[C] Describe plans to maintain the public engagement and Aboriginal consultation process following completion of the EIA report to ensure that the public and Aboriginal peoples will have an appropriate forum for expressing their views on the ongoing development, operation and reclamation of the Project.

[D] Describe how Suncor plans to understand and then measure the potential impact of the project to Aboriginal culture.

[E] Describe how Suncor's engagement and consultation plan will follow the United Nations Declaration on the Rights of Indigenous Peoples.

[F] Describe how Suncor plans to follow the principles outlined in the Indigenous Traditional Knowledge Framework submitted by the Cumulative Environmental Management Association **(CEMA ITKF)** in 2015.[1]

2 PROJECT DESCRIPTION

2.1 Overview

[A] Provide a brief project description in sufficient detail to provide context for the EIA, including:

a) proponent information;
b) proposed extractio**n and bitume**n processing technology;
c) amount and source of energy required for the Project;
d) water supply and disposal requirements, including process water and potable water requirements;
e) proposed method to transport product to markets; and
f) development plan and schedule.
g) Proposed climate change adaptation strategies for closure and reclamation planning;
h) Explain how the Project plans to meet the conditions defined in the Alberta Climate Plan

[B] Provide maps and/or drawings of the Project components and activities including:

[1] http://cemaonline.ca/index.php/administration/cat_view/2-communications/13-cema-general

a) existing infrastructure, leases and clearings, including exploration clearings;
b) proposed central processing/treatment and field facilities;
c) other buildings and infrastructure (e.g., pipelines and utilities);
d) temporary structures;
e) transportation and access routes including watercourse crossings;
f) on-site hydrocarbon storage;
g) containment structures such as retention ponds and storage ponds (e.g., lime sludge, stormwater runoff, boiler blow-down);
h) water wells/intakes, pipelines, and storage structures;
i) sources of aggregate resources, borrow material and other construction material and locations of any stockpiles that will be developed; and
j) waste storage area and disposal sites.
k) Make such maps and drawings publically available as shapefiles and KML files.

[C] Discuss the implications of a delay in proceeding with the Project, or any phase of the Project, or not going ahead with the Project. Also discuss whether changes to the project schedule might have a positive impact on the region's ecosystem and Indigenous people's use of the land.

[D] Describe the benefits of the Project, including jobs created, local training, employment and business opportunities, and royalties and taxes generated that accrue to:
a) Suncor;
b) local and regional communities, including local Aboriginal communities;
c) the local authority;
d) Alberta; and
e) Canada.

[E] Describe how benefits will be measured and how they might be weighed against one another (i.e. how is an economic benefit measured against a potential impact to a s.35 right?)

[F] Provide the adaptive management approach that will be implemented throughout the life of the Project. Include how monitoring, mitigation and accommodation of Aboriginal rights evaluation will be incorporated. Describe how traditional knowledge will be used throughout the project's life cycle to inform adaptive management practices.

[G] Discuss how Suncor will support Aboriginal community participation in regional monitoring initiatives defined in the adaptive management approach to evaluate mitigation measures implemented to address impacts to Aboriginal land uses and cultural practices.

[H] Provide rigorous updates to Environmental Impact Assessment if, in the project approval process, major process or reservoir exploitation changes are proposed (e.g. solvent injection, water treatment changes, etc.) or if project parameters are changed (e.g. SOR changed, thief zones discovered, water plant or boilers performance changed, etc.).

2.2 Constraints

[A] Discuss the process and criteria used to identify constraints to development, and how the Project has been designed to accommodate those constraints. Include the following:

a) any applicable *Alberta Land Stewardship Act* Regional Plan, including the Lower Athabasca Regional Plan and associated management frameworks;
b) how this Project aligns with the *Comprehensive Regional Infrastructure Sustainability Plan for the Athabasca Oil Sands Area*;
c) land use policies and resource management initiatives that pertain to the Project;
d) provincial and federal climate change policies and legislation;
e) Aboriginal traditional land, water and other use including any potential infringements to Aboriginal Rights;
f) fish and fish habitat maps for traditional use species and species at risk (as described in Section 3.5.1 [A] a to d) indicating critical or sensitive areas such as spawning, rearing and overwintering habitats, seasonal habitat use including migration and spawning routes;
g) map project footprint and facilities in relation to waterbodies, fish habitat and Aboriginal fisheries and describe how these were used to identify constraints, adjust footprint, minimize risks to aquatic resources and define proposed setbacks from waterbodies;
h) map project footprint and facilities in relation to biodiversity providing ability for Aboriginal communities to exercise constitutionally protected rights to hunt, fish and trap for food and to engage in traditional land uses and cultural practices associated with these rights;
i) discuss how implementation of environmental stewardship practices by Suncor could contribute to reductions in greenhouse gas emissions and how Suncor's development schedule may be modified to implement environmental stewardship practices supporting climate change adaptation strategies.
j) all known traplines and Registered Fur Management Areas;
k) the environmental setting;
l) cumulative environmental impacts in the region;
m) cumulative social impacts in the region;
n) cumulative cultural impacts to Aboriginal communities in the region;
o) results of project-specific and regional monitoring;
p) results of community-based monitoring programs; and
q) potential for new or additional technology to increase resource recovery or reduce emissions at later times; and
r) potential for changes in the regulatory regime; and
s) geologic conditions that may limit resource recovery strategies including, for example, pressure constraints for maintaining caprock integrity. Provide proposed mitigations and protection approaches to prevent cap rock failure or other causes of leaks of hydrocarbon to surface. .

[B] Discuss the selection criteria used, options considered, and rationale for selecting:
a) location of facilities and infrastructure (including linear infrastructure); and
b) thermal energy and electric power required for the Project.
c) Water supply sources;
d) Wastewater treatment management and disposal
e) Air emissions and air quality management systems, including environmental health and cumulative effects management considerations behind the selection and how the selections reflect best practice and technology

f) How traditional knowledge influenced the selection criteria, options and rational for selecting facilities and infrastructure.

[C] Provide a list of facilities for which locations will be determined later. Describe the selection criteria that will be used to determine the specific location of these facilities. Discuss how traditional knowledge and land-use constraints mapping will be used to identify facility locations.

2.3 Regional and Cooperative Efforts

[A] Discuss Suncor's involvement in regional and cooperative efforts to address environmental and socio-economic issues associated with regional development including how Suncor will support Aboriginal community involvement in these initiatives.

[B] Discuss Suncor's involvement in regional climate change adaptation initiatives including how Suncor will support establishment of a Climate and Traditional Knowledges Working Group for Aboriginal Communities to be involved in development and implementation of climate change adaptation policy and strategies.

[C] Discuss how Suncor will present performance standard results to Aboriginal communities regarding achieving regional climate leadership targets; include analysis for how missed outcomes will be achieved in subsequent years & describe financial contributions for missing targets or compliance flexibility; and define limits on flexibility to achieve certain targets;

[D] List regional multistakeholder groups that Suncor actively participates and how they have used, specifically discuss:

[a] Suncor's participation in regional forum and rational for choosing participation in some and not others;

[b] Suncor's fiscal commitments to regional and cooperative efforts as a percentage of overall estimated Project cost;

[c] How Suncor works with Indigenous communities to ensure those community's perspectives are part of regional and cooperative efforts.

[E] Describe opportunities for sharing infrastructure (e.g., access roads, utility corridors, water infrastructure) with other resource development stakeholders. Identify any potential obstacles to sharing infrastructure.

2.4 Transportation Infrastructure

[A] Prepare a Traffic Impact Assessment as per Alberta Transportation's *Traffic Impact Assessment Guideline (http://www.transportation.alberta.ca/613.htm)*.

a) Describe background traffic and consider the cumulative effects of traffic impacts due to other existing and planned developments using the same highways and accesses.
b) Discuss anticipated changes to highway traffic (e.g., type, volume) due to the Project.
c) Assess potential traffic impacts for all stages of the Project (e.g., construction, operation, maintenance, expansion, shutdown).
d) Determine any necessary improvements and methods to mitigate traffic impacts.

e) Describe how local Aboriginal community input was used to make determinations regarding the Traffic Impact Assessment

[B] Describe and map the locations of any new road or intersection construction, or any improvements to existing roads or intersections, related to the development of the Project, from the boundary of the Project Area up to and including the highway access points, and

a) discuss the alternatives and the rationale for selection for the preferred alternative;
b) discuss compatibility of the preferred alternative to Alberta Transportation's immediate and future plans;
c) describe the impacts to local communities of the changes in transportation and infrastructure; and
d) provide a proposed schedule for the work.

[C] Describe any infrastructure or activity that could have a potential impact on existing roads (e.g., pipelines or utilities crossing provincial highways, any facilities in close proximity of the highways, any smoke, dust, noise, light or precipitation generated by the Project that could impact the highway and road users).

[D] Provide a summary of any discussions with Alberta Transportation in regards to the Project and its traffic impacts.

[E] Develop an access management plan that incorporates traditional knowledge and land-use.

2.5 Air Emissions Management

[A] Discuss the selection criteria used, including human health and cumulative effects management options considered, and rationale for selecting control technologies to minimize air emission and ensure air quality management including the management of odours.

[B] Provide emission profiles (type, composition, rate and source) for the Project's operating and construction emissions including point and non-point sources and fugitive emissions. Consider both normal and upset conditions. Describe:

a) odorous and visible emissions from the proposed facilities;
b) annual and total greenhouse gas emissions during all stages of the Project. Identify the primary sources and provide calculations;
c) the intensity of greenhouse gas emissions per unit of bitumen produced;
d) the Project's contribution to total provincial and national greenhouse gas emissions on an annual basis;
e) describe the Project's greenhouse gas emissions relative to the provincial greenhouse gas emission limit for oil sands developments;
f) Suncor's overall greenhouse gas management plans;
g) amount and nature of Criteria and Trace Air Contaminants emissions;
h) the amount and nature of acidifying and eutrophying emissions, probable deposition patterns and rates;
i) control technologies used to reduce emissions;
j) emergency flaring scenarios (e.g., frequency and duration) and proposed measures to ensure flaring events are minimized;
k) upset condition scenarios (e.g., frequency and duration) and proposed measures to ensure upset conditions are minimized;

l) gas collection and conservation, and the applicability of vapour recovery technology;
m) applicability of sulphur recovery, acid gas re-injection or flue gas desulphurization to reduce sulphur emissions; and
n) fugitive emissions control technology to detect, measure and control emissions and odours from equipment leaks.
o) Develop a planned and unplanned event protocol with Aboriginal communities for potential upsets; and
p) Develop a continuous improvement plan for air emissions management that includes regular engagement with key Aboriginal stakeholders.
q) Develop a community-based monitoring plan for concerns with air quality

2.6 Water Management

2.6.1 Water Supply

[A] Describe the water supply requirements for the Project, including:

a) the criteria used, options considered and rationale for selection of water supply sources(s);
b) the expected water balance during all stages of the Project. Discuss assumptions made or methods chosen to arrive at the water balances;
c) the process water, potable water, and non-potable water requirements and sources for construction (including, but not limited to, road construction, winter road construction, lease construction, production well drilling and dust suppression), camp(s) and plant site, start-up, normal and emergency operating situations, decommissioning and reclamation. Identify the volume of water to be withdrawn from each source, considering plans for wastewater reuse. Describe the criteria and rational for selection of water sources and how traditional environmental knowledge was used in the process;
d) the location of sources/intakes and associated infrastructure (e.g., pipelines for water supply);
e) the variability in the amount of water required on an annual and seasonal basis as the Project is implemented;
f) the expected cumulative effects on water losses/gains resulting from the Project operations; assess cumulative effects on groundwater and surface water bodies from regional projects and the project's contribution to these using an integrated surface/water groundwater model that has been calibrated for local watersheds (e.g. USGD GS Flow Model which has been calibrated by Earth Fx for CEMA Water Working Group study);
g) contingency plans in the event of restrictions on the Project's water supply source (e.g., due to license conditions, source volume limitations, climate change or cumulative impact water deficits);
h) potable water treatment systems for all stages of the Project;
i) type and quantity of potable water treatment chemicals used; and
j) measures for ensuring efficient use of water including alternatives to reduce the consumption of non-saline water such as water use minimization, recycling, conservation, and technological improvements.

2.6.2 Surface Water

[A] Describe the surface water management strategy for all stages of the Project, including maps and supporting documentation pertaining to:

a) design factors considered; and
b) permanent or temporary alterations or realignments of watercourses, wetlands and other waterbodies.
c) stormwater facilities and management plans for plant sites, pad sites, soil stockpiles and linear infrastructure (e.g. roads and ROW's) Provide design criteria for any ponds, detention facilities or stormwater management infrastructure;
d) erosion control practices for soil stockpiles; and
e) impacts to taste and odor for local users of water from surface water sources.
f) Consideration to how the project might adversely affect Indigenous land use and rights.

[B] Describe and map all roadway, pipeline, powerline and any other utility crossings of watercourses or waterbodies.

2.6.3 Wastewater Management

[A] Describe the wastewater management strategy, including:

a) the criteria used, options considered and rationale for the selection of wastewater treatment and wastewater disposal;
b) the source, quantity and composition of each wastewater stream from each component of the proposed operation (e.g., bitumen extraction and associated facilities) for all project conditions, including normal, start-up, worst-case and upset conditions;
c) the proposed disposal locations and methods for each wastewater stream;
d) geologic formations for the disposal of wastewaters;
e) design of facilities that will collect, treat, store and release wastewater streams;
f) type and quantity of chemicals used in wastewater treatment; and
g) sewage treatment and disposal.
h) Demonstrate that all decisions made regarding Wastewater management meet best management and/or treatment practices;
i) Include adaptive management plans to ensure best management and/or treatment practices are updated as they become available.

2.7 Waste Management

[A] Discuss the selection criteria used, options considered, and rationale for all waste disposal relating to the Project both on and off-site

[B] Ensure that all decisions regarding on and off-site waste removal include consultation with the Aboriginal community to minimize potential impacts to traditional land-use and s. 35 rights;

[C] Establish a planned and unplanned event protocol with Aboriginal communities for upsets;

[D] Propose a Continuous Improvement Plan for managing Air Emissions and Odours

[E] Characterize and quantify the anticipated dangerous goods, and hazardous, non-hazardous, and recyclable wastes generated by the Project, and describe:

a) the composition and volume of specific waste streams and discuss ~~describe~~ how each stream will be managed;
b) how the disposal sites and sumps will be constructed; and
c) plans for pollution prevention, waste minimization, recycling, and management to reduce waste quantities for all stages of the Project.

2.8 Conservation and Reclamation

[A] Provide a lease-wide conceptual conservation and reclamation plan for the Project. Describe and map as applicable:

a) current land use and capability and proposed post-development land use and capability including the capability to support s.35 protected Aboriginal rights, Indigenous rights and traditional land-use;
b) anticipated timeframes for completion of reclamation stages and release of lands back to the Crown including an outline of the key milestone dates for reclamation and how progress to achieve these targets will be measured;
c) explain how reclamation will be completed to meet the Crown's obligation to provide lands for the exercising of s.35 rights, Aboriginal rights, and traditional land-use;
d) constraints to reclamation such as timing of activities, availability of reclamation materials and influence of natural processes and cycles including natural disturbance regimes;
e) constraints to reclamation resulting from potential impacts of climate change and climate change adaptation strategies to mitigate these constraints;
f) a revegetation plan for the disturbed terrestrial, riparian and wetland areas;
g) a plan to reestablish biodiversity across the lease to provide functioning ecosystems that provide the ability for Aboriginal communities to exercise constitutionally protected rights to hunt, fish and trap for food and to engage in traditional land uses and cultural practices associated with these rights on reclaimed lands;
h) a plan describing how Aboriginal communities will be involved in contributing to reclamation planning, monitoring and certification throughout the progressive reclamation activities of the Project;
i) reclamation material salvage, storage areas and handling procedures;
j) integrated weed management plan including a strategy to minimize use of chemical treatments in areas of Aboriginal traditional land use; and
k) existing and conceptual final reclaimed site drainage plans.

[B] Provide the expected timelines for establishment and recovery of vegetative communities and wildlife habitat and the expected differences in the resulting communities. .

[C] Describe how Suncor will consider the use of progressive reclamation in project design and reclamation planning.

[D] Describe uncertainties related to the conceptual reclamation plan.

[E] Discuss how Suncor will support Aboriginal community participation in advancing research to address knowledge gaps identified by the Cumulative Environmental Management Association's Reclamation Working Group and Land Working Group in 2015 and continued maintenance and updating of reclamation guidance policy documents referred to in EPEA approvals for oil sands extraction operations based on this research.

[F] Discuss opportunities for Aboriginal communities to operate nursery systems similar to the Brooks Crop Diversification Centre South Greenhouse for research and propagation of native plant species for use in oil sands reclamation.

[G] Discuss opportunities for Aboriginal communities to participate in the Oil Sands Vegetation Research Co-operative project underway at COSIA.

3 ENVIRONMENTAL ASSESSMENT

3.1 Assessment Base Case

[A] In addition to the assessment scenarios described in the Guide to Preparing Environmental Impact Assessments in Alberta, assess the following scenarios:

a) Pre-development base case as described in the CEMA ITKF

b) Current Case (approximately 2016)

The pre-development case should serve as the baseline upon which all other cases including the application case are compared.

[B] Cumulative Effects Case

a) assess the effects of past, present and future developments and activities that might magnify the impacts of the proposed project including:

i. Environmental, social and cultural impacts caused by the 2016 Horse River Wildfire;

ii. existing approved and reasonably foreseeable anthropogenic and natural events (i.e. other regional forest fires);

iii. Impacts to the environment that may contribute to Aboriginal cultural effects (i.e. project impacts to traditional land-use activities that negatively impact intergenerational knowledge transfer);

iv. Climate change.

3.2 Air Quality, Climate and Noise

3.2.1 Baseline Information

[A] Describe the baseline climatic and air quality conditions including:

a) the type and frequency of meteorological conditions that may result in poor air quality;
b) current regional air quality and air quality issues and trends including issues surrounding odours; and
c) appropriate ambient air quality parameters.
d) Consideration of the pre-disturbance baseline of existing and proposed industrial development projects in the region;
e) Consideration of how air quality issues might affect traditional land-use and how community-based monitoring and traditional knowledge might help better understand this issue.

3.2.2 Impact Assessment

[A] Identify components of the Project that will affect air quality, and:
a) describe the potential for reduced air quality (including odours and visibility) resulting from the Project and discuss implications of the expected air quality for environmental protection, quality of life and public health;
b) estimate ground-level concentrations of appropriate air quality parameters;
c) discuss expected changes to particulate deposition, nitrogen deposition or acidic deposition patterns;
d) identify areas that are predicted to exceed Potential Acid Input critical loading criteria;
e) discuss interactive effects that may occur resulting from 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.

[B] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

[C] Summarize the results of the noise assessment, and:
a) identify the nearest receptor used in the assessment; and
b) discuss the design, construction and operational factors to be incorporated into the Project to comply with the AER's *Directive 38: Noise Control*.
c) Discuss the potential for noise from the project to affect traditional land use activities and describe planned mitigation, best practices, and consultation with Aboriginal communities

3.3 Hydrogeology

3.3.1 Baseline Information

[A] Provide an overview of the existing geologic and hydrogeologic setting from the ground surface down to, and including, the oil producing zones and disposal zones, and:
a) present regional and Project Area geology to illustrate depth, thickness and spatial extent of lithology, stratigraphic units and structural features; and
b) present regional and Project Area hydrogeology describing:
    i) the major aquifers, aquitards and aquicludes (Quaternary and bedrock), their spatial distribution, properties, hydraulic connections between aquifers,

hydraulic heads, gradients, groundwater flow directions and velocities. Include maps and cross sections,

ii) the chemistry of groundwater aquifers including baseline concentrations of major ions, metals and hydrocarbon indicators,

iii) the potential discharge zones, potential recharge zones and sources, areas of groundwater-surface water interaction and areas of Quaternary aquifer-bedrock groundwater interaction,

iv) water well development and groundwater use, including an inventory of groundwater users,

v) the recharge potential for Quaternary aquifers,

vi) potential hydraulic connection between bitumen production zones, deep disposal formations and other aquifers resulting from project operations,

vii) the characterization of formations chosen for deep well disposal, including chemical compatibility and containment potential, injection capacity, hydrodynamic flow regime, and water quality assessments, and

viii) the locations of major facilities associated with the Project including facilities for waste storage, treatment and disposal (e.g., deep well disposal) and describe site-specific aquifer and shallow groundwater conditions beneath these proposed facilities. Provide supporting geological information.

3.3.2 Impact Assessment

[A] Describe project components and activities that have the potential to affect groundwater resource quantity and quality at all stages of the Project.

[B] Describe the nature and significance of the potential project impacts on groundwater with respect to:

a) inter-relationship between groundwater and surface water in terms of both groundwater and surface water quantity and quality;

b) implications for terrestrial or riparian vegetation, wildlife and aquatic resources including wetlands;

c) changes in groundwater quality, quantity and flow;

d) thermal impacts or changes resulting from reservoir steaming;

e) impacts on groundwater quality of any chemicals, gases or solvents used in drilling, well workovers or production operations;

f) conflicts with other groundwater users, and proposed resolutions to these conflicts;

g) potential implications of seasonal variations; and

h) groundwater withdrawal for project operations, including any expected alterations in the groundwater flow regime during and following project operations.

3.4 Hydrology

3.4.1 Baseline Information

[A] Describe and map the surface hydrology in the Project Area.

[B] Identify any surface water users who have existing approvals, permits or licenses.

3.4.2 Impact Assessment

[A] Describe the extent of hydrological changes that will result from disturbances to groundwater and surface water movement, and:

a) include changes to the quantity of surface flow, water levels and channel regime in watercourses (during minimum, average and peak flows) and water levels in waterbodies;
b) assess the potential impact of alterations in flow on the hydrology and identify all temporary and permanent alterations, channel realignments, disturbances or surface water withdrawals;
c) discuss the 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
d) identify any potential erosion problems in watercourses resulting from the Project.
e) identify and discuss impacts of potential surface heave.

[B] Describe impacts on other surface water users resulting from the Project. Identify any potential water use conflicts.

[C] Discuss the impact of low flow conditions and in-stream flow needs on water supply and water and wastewater management strategies.

[D] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

3.5 Surface Water Quality

3.5.1 Baseline Information

[A] Describe the baseline water quality of watercourses and waterbodies and their seasonal variations. Consider appropriate water quality parameters.

3.5.2 Impact Assessment

[A] Describe the potential impacts of the Project on surface water quality.

[B] Describe the potential impacts of the Project on: [1] "aesthetic" criteria including taste, color and odour as relevant to land users who may drink from surface waters; [2] possible migration of dissolved metals.

[C] Impacts on surface water quality of any chemicals, gases or solvents used in drilling, well workovers or production operations;

[D] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

3.6 Aquatic Ecology

3.6.1 Baseline Information

[A] Describe and map the fish, fish habitat and aquatic resources (e.g., aquatic and benthic invertebrates) of the lakes, rivers, ephemeral water bodies and other waters. Describe the species composition, distribution, relative abundance, movements and general life history parameters of fish resources. Also identify and map key habitat and distribution of any species that are:
a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);

b) listed in Schedule 1 of the federal *Species at Risk Act*;
c) listed as "at risk" by COSEWIC; and
d) traditionally used species (seek specific input from Aboriginal communities).

[B] Describe and map existing critical or sensitive areas such as spawning, rearing, and over-wintering habitats, seasonal habitat use including migration and spawning routes for "at risk" and traditionally used species.

[C] Describe the current and potential use of the fish resources by Aboriginal, sport or commercial fisheries.

[D] Describe regional baseline fish tissue quality including PAHs, metals, hydrocarbons, metals and tainting compounds.

3.6.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to fish, fish habitat, and other aquatic resources, considering:
a) habitat loss and alteration;
b) increased fishing pressures in the region that could arise from the increased human activity and improved access from the Project. Characterize the current use of local and regional fisheries resources to support the assessment of potential changes in angling pressure; Describe the fisheries management unit(s) and watercourses and waterbodies potentially affected by increased fishing pressure and identify any sport or commercial fisheries that are currently closed or substantially restricted and the reasons why;
c) increased habitat fragmentation;
d) proposed watercourse crossings including detail on fish and fish habitat and fish distribution upstream and downstream of the crossings, type of infrastructure to be installed (e.g. pipeline, road etc.), proposed crossing types (e.g, directional drilling, culvert, bridge); describe potential risks to aquatic resources from construction, operation and potential spills or leaks and how these risks will be mitigated. Describe monitoring, mitigation and emergency response plans;
e) acidification; and
f) groundwater-surface water interactions.
g) impacts of any chemicals, gases or solvents used in drilling, well workovers or production operations.

[B] Identify the key aquatic indicators that the Proponent used to assess project impacts. Discuss the rationale for their selection including consultation with Aboriginal communities.

[C] Identify plans proposed to offset any loss in the productivity of fish habitat. 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.

[D] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

3.7 Vegetation

3.7.1 Baseline Information

[A] Describe and map the vegetation communities, wetlands, rare plants, old growth forests, and communities of limited distribution. Identify the occurrence, relative abundance and distribution and identify any species that are:

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);
b) listed in Schedule 1 of the federal *Species at Risk Act*;
c) listed as "at risk" by COSEWIC; and
d) traditionally used species (seek specific input from Aboriginal communities).

[B] Describe and quantify the current extent of habitat fragmentation.

[C] Where lands have been disturbed (either anthropogenic or natural disturbance) in the study areas, map vegetation communities to pre-disturbance ecological classification units to quantify pre-industrial baseline. Seek input from Aboriginal communities to delineate pre-industrial baseline vegetation conditions.

3.7.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project on vegetation communities, considering:

a) existing, temporary (include timeframe) and permanent impacts;
b) potential impacts of climate change to vegetation and proposed climate change adaptation strategies;
c) the potential for introduction and colonization of weeds and non-native invasive species;
d) potential increased fragmentation and loss of upland, riparian and wetland habitats; and
e) implications of vegetation changes for other environmental resources (e.g., terrestrial and aquatic habitat diversity and quantity, water quality and quantity, erosion potential); and
f) impacts wetlands from any chemicals, gases or solvents used in drilling, well workovers or production operations.

[B] Identify key vegetation indicators used to assess the Project impacts. Discuss ~~Provide~~ the rationale for the indicator's selection. Seek specific input from Aboriginal communities to identify key vegetation indicators representative of traditional and cultural land uses.

3.8 Wildlife

3.8.1 Baseline Information

[A] Describe and map the wildlife resources (amphibians, reptiles, birds, and terrestrial and aquatic mammals). Describe species relative abundance, distribution and their use and potential use of habitats. Also identify any species that are:

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);
b) listed in Schedule 1 of the federal *Species at Risk Act*;
c) listed as "at risk" by COSEWIC; and

d) traditionally used species (Seek specific input from Aboriginal communities to identify key wildlife indicators representative of traditional and cultural land uses).

[B] Describe and map existing wildlife habitat and habitat disturbance including exploration activities. Identify habitat disturbances that are related to existing and approved projects.

3.8.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to wildlife and wildlife habitats, considering:

a) how the Project may affect wildlife relative abundance, habitat availability, mortality, movement patterns, and distribution for all stages of the Project;
b) how improved or altered access may affect wildlife;
c) how increased habitat fragmentation may affect wildlife. Consider edge effects, the availability of core habitat and the influence of linear features and infrastructure on wildlife movements and predator-prey relationships;
d) potential effects on wildlife resulting from changes to air and water quality, including both acute and chronic effects to animal health; and
e) potential effects on wildlife from the Proponent's proposed and planned exploration, seismic and core hole activities, including monitoring/4D seismic.

[B] Identify the key wildlife and habitat indicators used to assess project impacts. Discuss the rationale for their selection.

[C] Identify existing and future disturbance to caribou habitat in provincial and federal caribou ranges. Develop a caribou habitat restoration plan for existing disturbance and a lease-wide caribou habitat restoration plan for proposed disturbances including oil sands exploration and extraction disturbances.

[D] Identify how Suncor will support participation of Aboriginal communities in regional wildlife research and monitoring initiatives managed through COSIA (i.e., Regional Industry Caribou Collaboration) and provincial caribou range management planning activities.

[E] Identify how Suncor will support completion of unfinished wildlife reclamation research projects identified by the Cumulative Environmental Management Association's Reclamation Working Group and Land Working Group to address knowledge gaps and contribute to maintenance and updating of reclamation guidance documents referred to in EPEA approvals for oil sands extraction projects.

3.9 Biodiversity

3.9.1 Baseline Information

[A] Describe and map the existing biodiversity.

[B] Identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline biodiversity. Discuss the rationale for their selection. Seek specific input from Aboriginal communities to identify key biodiversity indicators at all scales (i.e., species, ecosystem, lease) representative of traditional and cultural land uses.

3.9.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to biodiversity considering:

a) the biodiversity metrics, biotic and abiotic indicators selected;
b) the effects of fragmentation on biodiversity potential;
c) the contribution of the Project to any anticipated changes in regional biodiversity and the potential impact to local and regional ecosystems;
d) the effects on functioning ecosystems that provide the ability for Aboriginal communities to exercise constitutionally protected rights to hunt, fish and trap for food and to engage in traditional land uses and cultural practices associated with these rights; and
e) effects during construction, operations and post-reclamation and the significance of these changes in a local and regional context.

3.10 Terrain and Soils

3.10.1 Baseline Information

[A] Describe and map the terrain and soils conditions in the Project Area.

[B] Describe and map soil types in the areas that are predicted to exceed Potential Acid Input critical loading criteria.

3.10.2 Impact Assessment

[A] Describe project activities and other related issues that could affect soil quality (e.g., compaction, contaminants) and:
a) indicate the expected amount (ha) of surface disturbance from the Project and associated infrastructure;
b) discuss the relevance of any changes for the local and regional landscapes, biodiversity, productivity, ecological integrity, aesthetics and future use;
c) identify the potential acidification impact on soils and discuss ~~describe~~ the significance of predicted impacts by acidifying emissions; and
d) describe potential sources of soil contamination.

[B] Discuss:
a) the environmental effects of proposed drilling methods on the landscape and surficial and bedrock geology;
b) the potential for changes in the ground surface during steaming and recovery operations (e.g., ground heave and/or subsidence) and their environmental implications; and
c) the potential impacts caused by the mulching and storage of woody debris considering, but not limited to, vulnerability to fire, degradation of soil quality, increased footprint.
d) proposed mitigation strategies to reduce use and need for chemicals (such as herbicides) & fertilizers in reclaimed lands associated with oil sands developments (i.e., pipeline rights-of-way, oil sands exploration disturbances, access roads, in situ well pads)

3.11 Land Use and Management

3.11.1 Baseline Information

[A] Describe and map the current land uses in the Project Area, including all Crown land dispositions and Crown Reservations (Holding Reservation, Protective Notation, Consultative Notation) and Aboriginal traditional land-use.

[B] If known, indicate where Crown land dispositions may be needed for roads or other infrastructure for the Project

[C] Identify and map unique sites or special features such as Parks and Protected Areas, Heritage Rivers, Historic Sites, Environmentally Significant Areas, cultural landscapes, Aboriginal land-use sites and other designations (e.g., World Heritage Sites, Ramsar Sites, Internationally Important Bird Areas).

[D] Describe and map known land clearing activities, showing the timing of the activities.

[E] Describe the status of timber harvesting arrangements.

[F] Describe existing access control measures.

[G] Make any data layers created through mapping processes available to the public as Shapefiles and KML files.

3.11.2 Impact Assessment

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

a) unique sites or special features;
b) changes in public access arising from linear development, including secondary effects related to increased hunter, angler and other recreational access;
c) aggregate reserves that may be located on land under the Proponent's control and reserves in the region; describe potential impacts of climate change to commercial forest harvesting and fire management and identify climate change adaptation strategies;
d) development and reclamation on commercial forest harvesting and fire management in the Project Area;
e) the amount of commercial and non-commercial forest land base that will be disturbed by the Project, including the Timber Productivity Ratings for the Project Area. Compare the baseline and reclaimed percentages and distribution of all forested communities in the Project Area;
f) how the Project impacts Annual Allowable Cuts and quotas within the Forest Management Agreement area;
g) the operations of any agricultural crown leases and provincial grazing reserves;
h) anticipated changes (type and extent) to the topography, elevation and drainage patterns within the Project Area; and
i) access control for public, regional recreational activities, Aboriginal land use and other land uses during and after development activities.

[B] Describe how Integrated Land Management will be considered (e.g., sharing of infrastructure, access requirements). Describe how Aboriginal communities were consulted and engaged in identifying Integrated Land Management strategies for maintenance of traditional land use areas.

[C] Describe how other Aboriginal land uses were used to establish an Access Management Plan that will minimize potential project impacts.

[D] Provide a wildfire control plan highlighting:

a) measures taken to ensure continued access for firefighters to adjacent wildland areas;
b) forest fire prevention, detection, reporting, and suppression measures, including proposed wildfire equipment;
c) measures for determining the clearing width of power line rights-of-way; and
d) required mitigation measures based on the *FireSmart Field Guide for the Upstream Oil and Gas Industry*.
e) Demonstrated engagement with Aboriginal communities, Regional Municipality of Wood Buffalo, and other key stakeholders.
f) Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project. Provide monitoring plans to check for such variability and indicate mitigations in such case.

4 HISTORIC RESOURCES

4.1 Baseline Information

[A] Provide an overview of the regional historical resources setting including a description of the relevant archaeological, historic and palaeontological records.

[B] Describe and map known historic resources sites in the Project Area, considering:

a) site type and assigned Historic Resources Values; and
b) existing site specific *Historical Resources Act* requirements.

[C] Provide an overview of previous Historical Resources Impact Assessments that have been conducted within the Project Area, including:

a) a description of the spatial extent of previous assessment relative to the Project Area, noting any assessment gap areas; and
b) a summary of *Historical Resources Act* requirements and/or clearances that have been issued for the Project to date.

[D] Identify locations within the Project Area that are likely to contain previously unrecorded historic resources. Describe the methods used to identify these areas. Seek specific input from Aboriginal communities. Describe proposed mitigation measures to avoid or reduce impacts to historic resources, whether previously identified or discovered in the course of project impact identification and planning.

[E] Identify locations within the Project Area that are likely to contain historic resources based upon traditional land-use information and traditional knowledge.

4.2 Impact Assessment

[A] Describe project components and activities that have the potential to affect historic resources at all stages of the Project.

[B] Describe the nature and magnitude of the potential project impacts on historical resources, considering:

a) effects on historic resources site integrity; and

b) implications for the interpretation of the archaeological, historic and palaeontological records.

5 TRADITIONAL ENVIRONMENTAL KNOWLEDGE, LAND USE AND CULTURAL IMPACTS

5.1 Baseline Information

[A] Provide a pre-development baseline (mid-1960s) of traditional land-use and cultural heritage.

a) Provide: a cultural impact assessment that determines the extent of the potential project impacts for each Aboriginal group identified through project consultation. This should include a specific assessment for McMurray Métis and Métis Nation of Alberta Members in Fort McMurray;
b) a map and description of traditional land use areas including fishing, hunting, trapping, nutritional, medicinal, cultural plant harvesting and other areas of interest to Aboriginal peoples (if the Aboriginal community or group is willing to have these locations disclosed);
c) a map of cabin sites, spiritual sites, cultural sites, graves and other traditional use sites traditional trails and resource activity patterns considered cultural resources and/or historic resources under the *Historical Resources Act* (if the Aboriginal community or group is willing to have these locations disclosed; and
d) a discussion of:
    i) the availability of vegetation, fish and wildlife species for food, traditional, medicinal and cultural purposes in the identified traditional land use areas considering all project related impacts, and access to traditional lands in the Project Area during all stages of the Project.

ii) Following the recommendations from the CEMA ITKF, describe how Traditional Environmental Knowledge and Traditional Land Use information was incorporated into the Project design, EIA development, the conservation, reclamation (including Indigenous views on land reclamation), monitoring and mitigation plans. If other constraints limited the ability to use recommendations based in Traditional Environmental Knowledge, please explain the accommodation efforts agreed to with each affected community.

Describe how the adaptive management model will include Traditional Environmental Knowledge and Traditional Land-Use information into the project at all development and reclamation phases.

5.2 Impact Assessment

[B] Determine the direct, indirect and cumulative impacts of the Project on traditional, medicinal and cultural purposes and identify possible mitigation strategies.

[C] Develop a plan to identify, monitor, mitigate and accommodate potential project impacts to Indigenous rights and traditional land-use.

6 PUBLIC HEALTH AND SAFETY

6.1 Public Health

[A] Describe aspects of the Project that may have implications for public health and quality of life or the delivery of regional health services. Determine quantitatively whether there may be implications for public health arising from the Project.

[B] Document any health concerns including mental health and stress raised by stakeholders and Aboriginal communities during consultation on the Project.

[C] Complete a cumulative effects assessment that determines whether the new project will have incremental impact on communities, particularly Aboriginal communities.

[D] Document any health concerns identified by Aboriginal communities resulting from impacts of existing development and of the Project, considering direct and indirect impacts to health, community wellness and culture. Include an Aboriginal receptor type in the assessment.

[E] Describe how perceived impacts to traditional resources might have a negative impact on the community.

[F] Describe the potential health impacts resulting from higher regional traffic volumes and the increased risk of accidental leaks and spills.

6.2 Public Safety

[A] Describe aspects of the Project that may have implications for public safety. Specifically:

a) describe the emergency response plan including public notification protocol and safety procedures to minimize adverse environmental effects, including emergency reporting procedures for spill containment and management;
b) document any safety concerns raised by stakeholders during Project consultation;
c) describe how local residents including those actively using the land (e.g. while hunting, fishing, gathering etc.) will be contacted during an emergency and the type of information that will be communicated to them;
d) describe the existing agreements with area municipalities or industry groups such as safety cooperatives, emergency response associations, regional mutual aid programs and municipal emergency response agencies; and
e) describe the potential safety impacts resulting from higher regional traffic volumes.
f) Document safety concerns raised by Aboriginal communities; include concerns raised in relation to traditional land-use.
g) Develop an emergency response plan in partnership with Aboriginal communities.

7 SOCIO-ECONOMIC ASSESSMENT

7.1 Baseline Information

[A] Describe the existing socio-economic conditions in the region and in the communities in the region.

[B] Describe the existing socio-economic conditions in the region’s Aboriginal communities, completing project specific socio-economic assessments in partnership with communities. This should include a specific socio-economic assessment of the McMurray Métis and Métis Nation of Alberta card holders in Fort McMurray.

[C]

[D] Describe factors that may affect existing socio-economic conditions including:

a) Identify the pre-development baseline socio-economic conditions;
b) population changes;
c) workforce requirements for all stages of the Project, including a description of when peak activity periods will occur;
d) planned accommodations for the workforce for all stages of the Project. Discuss the rationale for their selection;
e) the Proponent's policies and programs regarding the use of Aboriginal, local, regional and Alberta goods and services;
f) the project schedule; and
g) the overall engineering and contracting plan for the Project

7.2 Impact Assessment

[A] Describe the effects of construction and operation of the Project and its cumulative impact to existing socioeconomic conditions in the region including:

a) Aboriginal culture (e.g. traditional land-use and social, cultural, economic and political implications);
b) housing; including housing for First Nations and Métis residents of the RMWB
c) availability and quality of health care services; including availability and quality of health care services for First Nations and Métis residents;
d) local and regional infrastructure and community services; including local and regional infrastructure and community services for First Nations and Métis residents;
e) recreational activities; including recreational activities for First Nations and Métis residents;
f) hunting, fishing, trapping and gathering.

[B] Describe the socio-economic effects of any new or existing camp(s) required for the Project and identify:

a) its location;
b) the number of workers it is intended to house;
c) whether the camp will service the Project only or other clients;
d) the length of time the camp will be in service;
e) describe the services that will be provided in the camp (e.g., security, recreation and leisure, medical services), including a description of the impacts on Municipal or other external services; and
f) outline the emergency services and evacuation plan that will be in place;
g) How the project could be constructed without new camp infrastructure.

[C] Describe opportunities to work with First Nation and Métis communities and groups, other local residents and businesses regarding employment, training needs and other economic development opportunities arising from the Project.

[D] Describe how work with Aboriginal communities will be measured, monitored and evaluated for the life of the project;

[E] Describe how work with Aboriginal communities will be measured, monitored and evaluated between communities (how will the benefits to one community be measured against the benefits to another).

[F] Provide the estimated total project cost, including a breakdown for engineering and project management, equipment and materials, and labour for both construction and operation stages. Indicate the percentage of expenditures expected to occur in each Aboriginal community, the region, Alberta, Canada outside of Alberta, and outside of Canada.

[G] Explain whether Suncor plans to develop a social procurement strategy that will benefit not-for-profit and local socially minded businesses

8 MITIGATION MEASURES

[A] Discuss mitigation measures planned to avoid, minimize or eliminate the potential impacts for all stages of the Project.

[B] Discuss how Suncor will address project impacts to Aboriginal rights and s. 35 rights

[C] Identify the mitigation objectives for each associated impact and describe those mitigation measures that will be implemented. Provide rationale for their selection, including the effectiveness of the proposed mitigation.

[D] Describe how Suncor will engage Aboriginal communities in the development, implementation and monitoring of the effectiveness of mitigation measures for addressing impacts to Aboriginal traditional land uses.

[E] For impacts to Aboriginal communities, explain Suncor's process for working with the community to mitigate and accommodate those impacts.

9 RESIDUAL IMPACTS

[A] Describe the residual and cumulative residual impacts of the Project following implementation of Suncor's mitigation measures and Suncor's plans to manage those residual and cumulative impacts.

[B] Describe how Suncor will engage Aboriginal communities to manage residual impacts to Aboriginal traditional land uses and cultural practices.

10 MONITORING

[A] Describe Suncor's current and proposed monitoring programs, including:

a) how the monitoring programs will assess project impacts and measure the effectiveness of mitigation plans. Discuss how Suncor will address project impacts identified through the monitoring program;
b) how the adaptive management approach implemented by Suncor will be evaluated and modified based on monitoring data and how Aboriginal communities will be involved in evaluation of the effectiveness of the adaptive management approach;
c) how the monitoring programs will include community-based monitoring components;
d) How the monitoring programs will include traditional knowledge;
e) how Suncor will contribute to current and proposed regional monitoring programs;

f) monitoring performed in conjunction with other stakeholders, including Aboriginal communities and groups;
g) new monitoring initiatives that may be required as a result of the Project;
h) regional monitoring that will be undertaken to assist in managing environmental effects and improve environmental protection strategies;
i) how Aboriginal communities will be provided opportunities to obtain certification as Aboriginal Monitors (i.e., Alberta Innovates' Aboriginal Environmental Services Network Aboriginal Monitor Training Program) and be involved in design, delivery and analysis of monitoring programs;
j) how Aboriginal communities will be provided opportunities to develop monitoring programs specific to evaluating mitigation measures implemented to address impacts to traditional land uses and cultural practices;
k) how monitoring data will be disseminated to the public, Aboriginal communities or other interested parties; and
l) how the results of monitoring programs and publicly available monitoring information will be integrated with Suncor's environmental management system.

TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR SUNCOR ENERGY INC's PROPOSED

Meadow Creek West In-Situ PROJECT

Approximately 33 km west of Anzac, Alberta

ISSUED BY: **Suncor Energy Inc.**
150 6th Avenue S.W., Calgary, Alberta T2P 3E3

DATE:

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PURPOSE OF THE TERMS OF REFERENCE

The purpose of this document is to identify for Suncor Energy Inc. (Suncor), Aboriginal communities and appropriate stakeholders the information required by government agencies for an Environmental Impact Assessment (EIA) report prepared under the *Environmental Protection and Enhancement Act* (EPEA) for the Meadow Creek West Project (the Project).

Suncor is seeking approval to develop the proposed Project within portions of Townships 84 and 85, Ranges 9, 10, 11 and 12, W4M, located about 33 km west of the town of Anzac and about 38 km south of the city of Fort McMurray. The Project is owned by Suncor (75% operating interest) and Nexen Energy ULC (25%). The Project will use in situ technologies for extraction of bitumen from the McMurray formation.

The Project is expected to produce 40,000 barrels of bitumen per day (bpd) from one central processing facility (CPF) for 25 to 40 years. Project components will include steam generation including natural gas-fired cogeneration, water treatment and recycling, bitumen treatment, multi-well production pads, steam delivery pipelines, product recovery pipelines, local access roads, and borrow pits. The Project will be accessed from Highway 63. Pending regulatory approval, Suncor is planning to construct the project in a single phase beginning in 2022 with first oil in 2025.

SCOPE OF THE EIA REPORT

Suncor shall prepare and submit an EIA report that examines the cultural, environmental and socio-economic effects of the Project.

The EIA report shall be prepared considering all applicable provincial and federal legislation, codes of practice, guidelines, standards, policies and directives. This should include consideration of all Indigenous rights that may be impacted by the project and the Government of Alberta and Canada's commitment to implementing the United Nations Declaration on the Rights of Indigenous People (UNDRIP), the Truth and Reconciliation Commission of Canada (TRC) and rights protected under section 35 of the Canadian Constitution (s.35).

The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under EPEA and associated regulations, and the *Canadian Environmental Assessment Act* including an assessment as to whether Alberta consultation processes effectively meet the duty to consult with Métis communities. The EIA report will form part of Suncor's application to the Alberta Energy Regulator (AER). An EIA report summary will also be included as part of the AER Application.

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Suncor shall refer to the *Guide to Preparing Environmental Impact Assessment Reports in Alberta* published by Alberta Environment and Parks (the Guide) and these Terms of Reference when preparing the Environmental Impact Assessment report. In any case where there is a difference in requirements between the Guide and these Terms of Reference, the Terms of Reference shall take precedence.

CONTENT OF THE EIA REPORT

1 PUBLIC ENGAGEMENT AND INDIGENOUS CONSULTATION

[A] Describe the concerns and issues expressed by the public and the actions taken to address those concerns and issues, including how public input was incorporated into the Project development, impact mitigation and monitoring.

[B] Describe the concerns and issues expressed by Aboriginal communities and the actions taken to address those concerns and issues, including how Aboriginal community input and traditional knowledge was specifically incorporated into the Project, EIA development, mitigation, monitoring and reclamation. Describe your approach to consultation with Aboriginal communities with respect to, traditional knowledge and traditional use of land, water and air, and how you plan to use information shared to develop a better project.

[C] Describe plans to maintain the public engagement and Aboriginal consultation process following completion of the EIA report to ensure that the public and Aboriginal peoples will have an appropriate forum for expressing their views on the ongoing development, operation and reclamation of the Project.

[D] Describe how Suncor plans to understand and then measure the potential impact of the project to Aboriginal culture.

[E] Describe how Suncor's engagement and consultation plan will follow the United Nations Declaration on the Rights of Indigenous Peoples.

[F] Describe how Suncor plans to follow the principles outlined in the Indigenous Traditional Knowledge Framework submitted by the Cumulative Environmental Management Association **(CEMA ITKF)** in 2015.[1]

2 PROJECT DESCRIPTION

2.1 Overview

[A] Provide a brief project description in sufficient detail to provide context for the EIA, including:

a) proponent information;
b) proposed extraction **and bitume**n processing technology;
c) amount and source of energy required for the Project;
d) water supply and disposal requirements, including process water and potable water requirements;
e) proposed method to transport product to markets; and
f) development plan and schedule.
g) Proposed climate change adaptation strategies for closure and reclamation planning;
h) Explain how the Project plans to meet the conditions defined in the Alberta Climate Plan

[B] Provide maps and/or drawings of the Project components and activities including:

[1] http://cemaonline.ca/index.php/administration/cat_view/2-communications/13-cema-general

a) existing infrastructure, leases and clearings, including exploration clearings;
b) proposed central processing/treatment and field facilities;
c) other buildings and infrastructure (e.g., pipelines and utilities);
d) temporary structures;
e) transportation and access routes including watercourse crossings;
f) on-site hydrocarbon storage;
g) containment structures such as retention ponds and storage ponds (e.g., lime sludge, stormwater runoff, boiler blow-down);
h) water wells/intakes, pipelines, and storage structures;
i) sources of aggregate resources, borrow material and other construction material and locations of any stockpiles that will be developed; and
j) waste storage area and disposal sites.
k) Make such maps and drawings publically available as shapefiles and KML files.

[C] Discuss the implications of a delay in proceeding with the Project, or any phase of the Project, or not going ahead with the Project. Also discuss whether changes to the project schedule might have a positive impact on the region's ecosystem and Indigenous people's use of the land.

[D] Describe the benefits of the Project, including jobs created, local training, employment and business opportunities, and royalties and taxes generated that accrue to:
a) Suncor;
b) local and regional communities, including local Aboriginal communities;
c) the local authority;
d) Alberta; and
e) Canada.

[E] Describe how benefits will be measured and how they might be weighed against one another (i.e. how is an economic benefit measured against a potential impact to a s.35 right?)

[F] Provide the adaptive management approach that will be implemented throughout the life of the Project. Include how monitoring, mitigation and accommodation of Aboriginal rights evaluation will be incorporated. Describe how traditional knowledge will be used throughout the project's life cycle to inform adaptive management practices.

[G] Discuss how Suncor will support Aboriginal community participation in regional monitoring initiatives defined in the adaptive management approach to evaluate mitigation measures implemented to address impacts to Aboriginal land uses and cultural practices.

[H] Provide rigorous updates to Environmental Impact Assessment if, in the project approval process, major process or reservoir exploitation changes are proposed (e.g. solvent injection, water treatment changes, etc.) or if project parameters are changed (e.g. SOR changed, thief zones discovered, water plant or boilers performance changed, etc.).

2.2 Constraints

[A] Discuss the process and criteria used to identify constraints to development, and how the Project has been designed to accommodate those constraints. Include the following:

a) any applicable *Alberta Land Stewardship Act* Regional Plan, including the Lower Athabasca Regional Plan and associated management frameworks;
b) how this Project aligns with the *Comprehensive Regional Infrastructure Sustainability Plan for the Athabasca Oil Sands Area*;
c) land use policies and resource management initiatives that pertain to the Project;
d) provincial and federal climate change policies and legislation;
e) Aboriginal traditional land, water and other use including any potential infringements to Aboriginal Rights;
f) fish and fish habitat maps for traditional use species and species at risk (as described in Section 3.5.1 [A] a to d) indicating critical or sensitive areas such as spawning, rearing and overwintering habitats, seasonal habitat use including migration and spawning routes;
g) map project footprint and facilities in relation to waterbodies, fish habitat and Aboriginal fisheries and describe how these were used to identify constraints, adjust footprint, minimize risks to aquatic resources and define proposed setbacks from waterbodies;
h) map project footprint and facilities in relation to biodiversity providing ability for Aboriginal communities to exercise constitutionally protected rights to hunt, fish and trap for food and to engage in traditional land uses and cultural practices associated with these rights;
i) discuss how implementation of environmental stewardship practices by Suncor could contribute to reductions in greenhouse gas emissions and how Suncor's development schedule may be modified to implement environmental stewardship practices supporting climate change adaptation strategies.
j) all known traplines and Registered Fur Management Areas;
k) the environmental setting;
l) cumulative environmental impacts in the region;
m) cumulative social impacts in the region;
n) cumulative cultural impacts to Aboriginal communities in the region;
o) results of project-specific and regional monitoring;
p) results of community-based monitoring programs; and
q) potential for new or additional technology to increase resource recovery or reduce emissions at later times; and
r) potential for changes in the regulatory regime; and
s) geologic conditions that may limit resource recovery strategies including, for example, pressure constraints for maintaining caprock integrity. Provide proposed mitigations and protection approaches to prevent cap rock failure or other causes of leaks of hydrocarbon to surface. .

[B] Discuss the selection criteria used, options considered, and rationale for selecting:
a) location of facilities and infrastructure (including linear infrastructure); and
b) thermal energy and electric power required for the Project.
c) Water supply sources;
d) Wastewater treatment management and disposal
e) Air emissions and air quality management systems, including environmental health and cumulative effects management considerations behind the selection and how the selections reflect best practice and technology

f) How traditional knowledge influenced the selection criteria, options and rational for selecting facilities and infrastructure.

[C] Provide a list of facilities for which locations will be determined later. Describe the selection criteria that will be used to determine the specific location of these facilities. Discuss how traditional knowledge and land-use constraints mapping will be used to identify facility locations.

2.3 Regional and Cooperative Efforts

[A] Discuss Suncor's involvement in regional and cooperative efforts to address environmental and socio-economic issues associated with regional development including how Suncor will support Aboriginal community involvement in these initiatives.

[B] Discuss Suncor's involvement in regional climate change adaptation initiatives including how Suncor will support establishment of a Climate and Traditional Knowledges Working Group for Aboriginal Communities to be involved in development and implementation of climate change adaptation policy and strategies.

[C] Discuss how Suncor will present performance standard results to Aboriginal communities regarding achieving regional climate leadership targets; include analysis for how missed outcomes will be achieved in subsequent years & describe financial contributions for missing targets or compliance flexibility; and define limits on flexibility to achieve certain targets;

[D] List regional multistakeholder groups that Suncor actively participates and how they have used, specifically discuss:

[a] Suncor's participation in regional forum and rational for choosing participation in some and not others;

[b] Suncor's fiscal commitments to regional and cooperative efforts as a percentage of overall estimated Project cost;

[c] How Suncor works with Indigenous communities to ensure those community's perspectives are part of regional and cooperative efforts.

[A] Describe opportunities for sharing infrastructure (e.g., access roads, utility corridors, water infrastructure) with other resource development stakeholders. Identify any potential obstacles to sharing infrastructure.

2.4 Transportation Infrastructure

[A] Prepare a Traffic Impact Assessment as per Alberta Transportation's *Traffic Impact Assessment Guideline (http://www.transportation.alberta.ca/613.htm)*.

a) Describe background traffic and consider the cumulative effects of traffic impacts due to other existing and planned developments using the same highways and accesses.
b) Discuss anticipated changes to highway traffic (e.g., type, volume) due to the Project.
c) Assess potential traffic impacts for all stages of the Project (e.g., construction, operation, maintenance, expansion, shutdown).
d) Determine any necessary improvements and methods to mitigate traffic impacts.

e) Describe how local Aboriginal community input was used to make determinations regarding the Traffic Impact Assessment

[B] Describe and map the locations of any new road or intersection construction, or any improvements to existing roads or intersections, related to the development of the Project, from the boundary of the Project Area up to and including the highway access points, and

a) discuss the alternatives and the rationale for selection for the preferred alternative;
b) discuss compatibility of the preferred alternative to Alberta Transportation's immediate and future plans;
c) describe the impacts to local communities of the changes in transportation and infrastructure; and
d) provide a proposed schedule for the work.

[C] Describe any infrastructure or activity that could have a potential impact on existing roads (e.g., pipelines or utilities crossing provincial highways, any facilities in close proximity of the highways, any smoke, dust, noise, light or precipitation generated by the Project that could impact the highway and road users).

[D] Provide a summary of any discussions with Alberta Transportation in regards to the Project and its traffic impacts.

[E] Develop an access management plan that incorporates traditional knowledge and land-use.

2.5 Air Emissions Management

[A] Discuss the selection criteria used, including human health and cumulative effects management options considered, and rationale for selecting control technologies to minimize air emission and ensure air quality management including the management of odours.

[B] Provide emission profiles (type, composition, rate and source) for the Project's operating and construction emissions including point and non-point sources and fugitive emissions. Consider both normal and upset conditions. Describe:

a) odorous and visible emissions from the proposed facilities;
b) annual and total greenhouse gas emissions during all stages of the Project. Identify the primary sources and provide calculations;
c) the intensity of greenhouse gas emissions per unit of bitumen produced;
d) the Project's contribution to total provincial and national greenhouse gas emissions on an annual basis;
e) describe the Project's greenhouse gas emissions relative to the provincial greenhouse gas emission limit for oil sands developments;
f) Suncor's overall greenhouse gas management plans;
g) amount and nature of Criteria and Trace Air Contaminants emissions;
h) the amount and nature of acidifying and eutrophying emissions, probable deposition patterns and rates;
i) control technologies used to reduce emissions;
j) emergency flaring scenarios (e.g., frequency and duration) and proposed measures to ensure flaring events are minimized;
k) upset condition scenarios (e.g., frequency and duration) and proposed measures to ensure upset conditions are minimized;

l) gas collection and conservation, and the applicability of vapour recovery technology;
m) applicability of sulphur recovery, acid gas re-injection or flue gas desulphurization to reduce sulphur emissions; and
n) fugitive emissions control technology to detect, measure and control emissions and odours from equipment leaks.
o) Develop a planned and unplanned event protocol with Aboriginal communities for potential upsets; and
p) Develop a continuous improvement plan for air emissions management that includes regular engagement with key Aboriginal stakeholders.
q) Develop a community-based monitoring plan for concerns with air quality

2.6 Water Management

2.6.1 Water Supply

[A] Describe the water supply requirements for the Project, including:

a) the criteria used, options considered and rationale for selection of water supply sources(s);
b) the expected water balance during all stages of the Project. Discuss assumptions made or methods chosen to arrive at the water balances;
c) the process water, potable water, and non-potable water requirements and sources for construction (including, but not limited to, road construction, winter road construction, lease construction, production well drilling and dust suppression), camp(s) and plant site, start-up, normal and emergency operating situations, decommissioning and reclamation. Identify the volume of water to be withdrawn from each source, considering plans for wastewater reuse. Describe the criteria and rational for selection of water sources and how traditional environmental knowledge was used in the process;
d) the location of sources/intakes and associated infrastructure (e.g., pipelines for water supply);
e) the variability in the amount of water required on an annual and seasonal basis as the Project is implemented;
f) the expected cumulative effects on water losses/gains resulting from the Project operations; assess cumulative effects on groundwater and surface water bodies from regional projects and the project's contribution to these using an integrated surface/water groundwater model that has been calibrated for local watersheds (e.g. USGD GS Flow Model which has been calibrated by Earth Fx for CEMA Water Working Group study);
g) contingency plans in the event of restrictions on the Project's water supply source (e.g., due to license conditions, source volume limitations, climate change or cumulative impact water deficits);
h) potable water treatment systems for all stages of the Project;
i) type and quantity of potable water treatment chemicals used; and
j) measures for ensuring efficient use of water including alternatives to reduce the consumption of non-saline water such as water use minimization, recycling, conservation, and technological improvements.

2.6.2 Surface Water

[A] Describe the surface water management strategy for all stages of the Project, including maps and supporting documentation pertaining to:

a) design factors considered; and
b) permanent or temporary alterations or realignments of watercourses, wetlands and other waterbodies.
c) stormwater facilities and management plans for plant sites, pad sites, soil stockpiles and linear infrastructure (e.g. roads and ROW's) Provide design criteria for any ponds, detention facilities or stormwater management infrastructure;
d) erosion control practices for soil stockpiles; and
e) impacts to taste and odor for local users of water from surface water sources.
f) Consideration to how the project might adversely affect Indigenous land use and rights.

[B] Describe and map all roadway, pipeline, powerline and any other utility crossings of watercourses or waterbodies.

2.6.3 Wastewater Management

[A] Describe the wastewater management strategy, including:

a) the criteria used, options considered and rationale for the selection of wastewater treatment and wastewater disposal;
b) the source, quantity and composition of each wastewater stream from each component of the proposed operation (e.g., bitumen extraction and associated facilities) for all project conditions, including normal, start-up, worst-case and upset conditions;
c) the proposed disposal locations and methods for each wastewater stream;
d) geologic formations for the disposal of wastewaters;
e) design of facilities that will collect, treat, store and release wastewater streams;
f) type and quantity of chemicals used in wastewater treatment; and
g) sewage treatment and disposal.
h) Demonstrate that all decisions made regarding Wastewater management meet best management and/or treatment practices;
i) Include adaptive management plans to ensure best management and/or treatment practices are updated as they become available.

2.7 Waste Management

[A] Discuss the selection criteria used, options considered, and rationale for all waste disposal relating to the Project both on and off-site

[B] Ensure that all decisions regarding on and off-site waste removal include consultation with the Aboriginal community to minimize potential impacts to traditional land-use and s. 35 rights;

[C] Establish a planned and unplanned event protocol with Aboriginal communities for upsets;

[D] Propose a Continuous Improvement Plan for managing Air Emissions and Odours

[E] Characterize and quantify the anticipated dangerous goods, and hazardous, non-hazardous, and recyclable wastes generated by the Project, and describe:

a) the composition and volume of specific waste streams and discuss ~~describe~~ how each stream will be managed;
b) how the disposal sites and sumps will be constructed; and
c) plans for pollution prevention, waste minimization, recycling, and management to reduce waste quantities for all stages of the Project.

2.8 Conservation and Reclamation

[A] Provide a lease-wide conceptual conservation and reclamation plan for the Project. Describe and map as applicable:

a) current land use and capability and proposed post-development land use and capability including the capability to support s.35 protected Aboriginal rights, Indigenous rights and traditional land-use;
b) anticipated timeframes for completion of reclamation stages and release of lands back to the Crown including an outline of the key milestone dates for reclamation and how progress to achieve these targets will be measured;
c) explain how reclamation will be completed to meet the Crown's obligation to provide lands for the exercising of s.35 rights, Aboriginal rights, and traditional land-use;
d) constraints to reclamation such as timing of activities, availability of reclamation materials and influence of natural processes and cycles including natural disturbance regimes;
e) constraints to reclamation resulting from potential impacts of climate change and climate change adaptation strategies to mitigate these constraints;
f) a revegetation plan for the disturbed terrestrial, riparian and wetland areas;
g) a plan to reestablish biodiversity across the lease to provide functioning ecosystems that provide the ability for Aboriginal communities to exercise constitutionally protected rights to hunt, fish and trap for food and to engage in traditional land uses and cultural practices associated with these rights on reclaimed lands;
h) a plan describing how Aboriginal communities will be involved in contributing to reclamation planning, monitoring and certification throughout the progressive reclamation activities of the Project;
i) reclamation material salvage, storage areas and handling procedures;
j) integrated weed management plan including a strategy to minimize use of chemical treatments in areas of Aboriginal traditional land use; and
k) existing and conceptual final reclaimed site drainage plans.

[B] Provide the expected timelines for establishment and recovery of vegetative communities and wildlife habitat and the expected differences in the resulting communities. .

[C] Describe how Suncor will consider the use of progressive reclamation in project design and reclamation planning.

[D] Describe uncertainties related to the conceptual reclamation plan.

[E] Discuss how Suncor will support Aboriginal community participation in advancing research to address knowledge gaps identified by the Cumulative Environmental Management Association's Reclamation Working Group and Land Working Group in 2015 and continued maintenance and updating of reclamation guidance policy documents referred to in EPEA approvals for oil sands extraction operations based on this research.

[F] Discuss opportunities for Aboriginal communities to operate nursery systems similar to the Brooks Crop Diversification Centre South Greenhouse for research and propagation of native plant species for use in oil sands reclamation.

[G] Discuss opportunities for Aboriginal communities to participate in the Oil Sands Vegetation Research Co-operative project underway at COSIA.

3 ENVIRONMENTAL ASSESSMENT

3.1 Assessment Base Case

[A] In addition to the assessment scenarios described in the Guide to Preparing Environmental Impact Assessments in Alberta, assess the following scenarios:

a) Pre-development base case as described in the CEMA ITKF

b) Current Case (approximately 2016)

The pre-development case should serve as the baseline upon which all other cases including the application case are compared.

[B] Cumulative Effects Case

a) assess the effects of past, present and future developments and activities that might magnify the impacts of the proposed project including:

i. Environmental, social and cultural impacts caused by the 2016 Horse River Wildfire;

ii. existing approved and reasonably foreseeable anthropogenic and natural events (i.e. other regional forest fires);

iii. Impacts to the environment that may contribute to Aboriginal cultural effects (i.e. project impacts to traditional land-use activities that negatively impact intergenerational knowledge transfer);

iv. Climate change.

3.2 Air Quality, Climate and Noise

3.2.1 Baseline Information

[A] Describe the baseline climatic and air quality conditions including:

a) the type and frequency of meteorological conditions that may result in poor air quality;
b) current regional air quality and air quality issues and trends including issues surrounding odours; and
c) appropriate ambient air quality parameters.
d) Consideration of the pre-disturbance baseline of existing and proposed industrial development projects in the region;
e) Consideration of how air quality issues might affect traditional land-use and how community-based monitoring and traditional knowledge might help better understand this issue.

3.2.2 Impact Assessment

[A] Identify components of the Project that will affect air quality, and:
a) describe the potential for reduced air quality (including odours and visibility) resulting from the Project and discuss implications of the expected air quality for environmental protection, quality of life and public health;
b) estimate ground-level concentrations of appropriate air quality parameters;
c) discuss expected changes to particulate deposition, nitrogen deposition or acidic deposition patterns;
d) identify areas that are predicted to exceed Potential Acid Input critical loading criteria;
e) discuss interactive effects that may occur resulting from 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.

[B] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

[C] Summarize the results of the noise assessment, and:
a) identify the nearest receptor used in the assessment; and
b) discuss the design, construction and operational factors to be incorporated into the Project to comply with the AER's *Directive 38: Noise Control*.
c) Discuss the potential for noise from the project to affect traditional land use activities and describe planned mitigation, best practices, and consultation with Aboriginal communities

3.3 Hydrogeology

3.3.1 Baseline Information

[A] Provide an overview of the existing geologic and hydrogeologic setting from the ground surface down to, and including, the oil producing zones and disposal zones, and:
a) present regional and Project Area geology to illustrate depth, thickness and spatial extent of lithology, stratigraphic units and structural features; and
b) present regional and Project Area hydrogeology describing:
    i) the major aquifers, aquitards and aquicludes (Quaternary and bedrock), their spatial distribution, properties, hydraulic connections between aquifers,

hydraulic heads, gradients, groundwater flow directions and velocities. Include maps and cross sections,

ii) the chemistry of groundwater aquifers including baseline concentrations of major ions, metals and hydrocarbon indicators,

iii) the potential discharge zones, potential recharge zones and sources, areas of groundwater-surface water interaction and areas of Quaternary aquifer-bedrock groundwater interaction,

iv) water well development and groundwater use, including an inventory of groundwater users,

v) the recharge potential for Quaternary aquifers,

vi) potential hydraulic connection between bitumen production zones, deep disposal formations and other aquifers resulting from project operations,

vii) the characterization of formations chosen for deep well disposal, including chemical compatibility and containment potential, injection capacity, hydrodynamic flow regime, and water quality assessments, and

viii) the locations of major facilities associated with the Project including facilities for waste storage, treatment and disposal (e.g., deep well disposal) and describe site-specific aquifer and shallow groundwater conditions beneath these proposed facilities. Provide supporting geological information.

3.3.2 Impact Assessment

[A] Describe project components and activities that have the potential to affect groundwater resource quantity and quality at all stages of the Project.

[B] Describe the nature and significance of the potential project impacts on groundwater with respect to:

a) inter-relationship between groundwater and surface water in terms of both groundwater and surface water quantity and quality;

b) implications for terrestrial or riparian vegetation, wildlife and aquatic resources including wetlands;

c) changes in groundwater quality, quantity and flow;

d) thermal impacts or changes resulting from reservoir steaming;

e) impacts on groundwater quality of any chemicals, gases or solvents used in drilling, well workovers or production operations;

f) conflicts with other groundwater users, and proposed resolutions to these conflicts;

g) potential implications of seasonal variations; and

h) groundwater withdrawal for project operations, including any expected alterations in the groundwater flow regime during and following project operations.

3.4 Hydrology

3.4.1 Baseline Information

[A] Describe and map the surface hydrology in the Project Area.

[B] Identify any surface water users who have existing approvals, permits or licenses.

3.4.2 Impact Assessment

[A] Describe the extent of hydrological changes that will result from disturbances to groundwater and surface water movement, and:

a) include changes to the quantity of surface flow, water levels and channel regime in watercourses (during minimum, average and peak flows) and water levels in waterbodies;
b) assess the potential impact of alterations in flow on the hydrology and identify all temporary and permanent alterations, channel realignments, disturbances or surface water withdrawals;
c) discuss the 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
d) identify any potential erosion problems in watercourses resulting from the Project.
e) identify and discuss impacts of potential surface heave.

[B] Describe impacts on other surface water users resulting from the Project. Identify any potential water use conflicts.

[C] Discuss the impact of low flow conditions and in-stream flow needs on water supply and water and wastewater management strategies.

[D] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

3.5 Surface Water Quality

3.5.1 Baseline Information

[A] Describe the baseline water quality of watercourses and waterbodies and their seasonal variations. Consider appropriate water quality parameters.

3.5.2 Impact Assessment

[A] Describe the potential impacts of the Project on surface water quality.

[B] Describe the potential impacts of the Project on: [1] "aesthetic" criteria including taste, color and odour as relevant to land users who may drink from surface waters; [2] possible migration of dissolved metals.

[C] Impacts on surface water quality of any chemicals, gases or solvents used in drilling, well workovers or production operations;

[D] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

3.6 Aquatic Ecology

3.6.1 Baseline Information

[A] Describe and map the fish, fish habitat and aquatic resources (e.g., aquatic and benthic invertebrates) of the lakes, rivers, ephemeral water bodies and other waters. Describe the species composition, distribution, relative abundance, movements and general life history parameters of fish resources. Also identify and map key habitat and distribution of any species that are:
a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);

b) listed in Schedule 1 of the federal *Species at Risk Act*;
c) listed as "at risk" by COSEWIC; and
d) traditionally used species (seek specific input from Aboriginal communities).

[B] Describe and map existing critical or sensitive areas such as spawning, rearing, and over-wintering habitats, seasonal habitat use including migration and spawning routes for "at risk" and traditionally used species.

[C] Describe the current and potential use of the fish resources by Aboriginal, sport or commercial fisheries.

[D] Describe regional baseline fish tissue quality including PAHs, metals, hydrocarbons, metals and tainting compounds.

3.6.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to fish, fish habitat, and other aquatic resources, considering:.

a) habitat loss and alteration;
b) increased fishing pressures in the region that could arise from the increased human activity and improved access from the Project. Characterize the current use of local and regional fisheries resources to support the assessment of potential changes in angling pressure; Describe the fisheries management unit(s) and watercourses and waterbodies potentially affected by increased fishing pressure and identify any sport or commercial fisheries that are currently closed or substantially restricted and the reasons why;
c) increased habitat fragmentation;
d) proposed watercourse crossings including detail on fish and fish habitat and fish distribution upstream and downstream of the crossings, type of infrastructure to be installed (e.g. pipeline, road etc.), proposed crossing types (e.g, directional drilling, culvert, bridge); describe potential risks to aquatic resources from construction, operation and potential spills or leaks and how these risks will be mitigated. Describe monitoring, mitigation and emergency response plans;
e) acidification; and
f) groundwater-surface water interactions.
g) impacts of any chemicals, gases or solvents used in drilling, well workovers or production operations.

[B] Identify the key aquatic indicators that the Proponent used to assess project impacts. Discuss the rationale for their selection including consultation with Aboriginal communities.

[C] Identify plans proposed to offset any loss in the productivity of fish habitat. 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.

[D] Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project.

3.7 Vegetation

3.7.1 Baseline Information

[A] Describe and map the vegetation communities, wetlands, rare plants, old growth forests, and communities of limited distribution. Identify the occurrence, relative abundance and distribution and identify any species that are:

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);
b) listed in Schedule 1 of the federal *Species at Risk Act*;
c) listed as "at risk" by COSEWIC; and
d) traditionally used species (seek specific input from Aboriginal communities).

[B] Describe and quantify the current extent of habitat fragmentation.

[C] Where lands have been disturbed (either anthropogenic or natural disturbance) in the study areas, map vegetation communities to pre-disturbance ecological classification units to quantify pre-industrial baseline. Seek input from Aboriginal communities to delineate pre-industrial baseline vegetation conditions.

3.7.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project on vegetation communities, considering:

a) existing, temporary (include timeframe) and permanent impacts;
b) potential impacts of climate change to vegetation and proposed climate change adaptation strategies;
c) the potential for introduction and colonization of weeds and non-native invasive species;
d) potential increased fragmentation and loss of upland, riparian and wetland habitats; and
e) implications of vegetation changes for other environmental resources (e.g., terrestrial and aquatic habitat diversity and quantity, water quality and quantity, erosion potential); and
f) impacts wetlands from any chemicals, gases or solvents used in drilling, well workovers or production operations.

[B] Identify key vegetation indicators used to assess the Project impacts. Discuss ~~Provide~~ the rationale for the indicator's selection. Seek specific input from Aboriginal communities to identify key vegetation indicators representative of traditional and cultural land uses.

3.8 Wildlife

3.8.1 Baseline Information

[A] Describe and map the wildlife resources (amphibians, reptiles, birds, and terrestrial and aquatic mammals). Describe species relative abundance, distribution and their use and potential use of habitats. Also identify any species that are:

a) listed as "at Risk, May be at Risk and Sensitive" in the *General Status of Alberta Wild Species* (Alberta Environment and Sustainable Resource Development);
b) listed in Schedule 1 of the federal *Species at Risk Act*;
c) listed as "at risk" by COSEWIC; and

d) traditionally used species (Seek specific input from Aboriginal communities to identify key wildlife indicators representative of traditional and cultural land uses).

[B] Describe and map existing wildlife habitat and habitat disturbance including exploration activities. Identify habitat disturbances that are related to existing and approved projects.

3.8.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to wildlife and wildlife habitats, considering:

a) how the Project may affect wildlife relative abundance, habitat availability, mortality, movement patterns, and distribution for all stages of the Project;
b) how improved or altered access may affect wildlife;
c) how increased habitat fragmentation may affect wildlife. Consider edge effects, the availability of core habitat and the influence of linear features and infrastructure on wildlife movements and predator-prey relationships;
d) potential effects on wildlife resulting from changes to air and water quality, including both acute and chronic effects to animal health; and
e) potential effects on wildlife from the Proponent's proposed and planned exploration, seismic and core hole activities, including monitoring/4D seismic.

[B] Identify the key wildlife and habitat indicators used to assess project impacts. Discuss the rationale for their selection.

[C] Identify existing and future disturbance to caribou habitat in provincial and federal caribou ranges. Develop a caribou habitat restoration plan for existing disturbance and a lease-wide caribou habitat restoration plan for proposed disturbances including oil sands exploration and extraction disturbances.

[D] Identify how Suncor will support participation of Aboriginal communities in regional wildlife research and monitoring initiatives managed through COSIA (i.e., Regional Industry Caribou Collaboration) and provincial caribou range management planning activities.

[E] Identify how Suncor will support completion of unfinished wildlife reclamation research projects identified by the Cumulative Environmental Management Association's Reclamation Working Group and Land Working Group to address knowledge gaps and contribute to maintenance and updating of reclamation guidance documents referred to in EPEA approvals for oil sands extraction projects.

3.9 Biodiversity

3.9.1 Baseline Information

[A] Describe and map the existing biodiversity.

[B] Identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline biodiversity. Discuss the rationale for their selection. Seek specific input from Aboriginal communities to identify key biodiversity indicators at all scales (i.e., species, ecosystem, lease) representative of traditional and cultural land uses.

3.9.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project to biodiversity considering:

a) the biodiversity metrics, biotic and abiotic indicators selected;
b) the effects of fragmentation on biodiversity potential;
c) the contribution of the Project to any anticipated changes in regional biodiversity and the potential impact to local and regional ecosystems;
d) the effects on functioning ecosystems that provide the ability for Aboriginal communities to exercise constitutionally protected rights to hunt, fish and trap for food and to engage in traditional land uses and cultural practices associated with these rights; and
e) effects during construction, operations and post-reclamation and the significance of these changes in a local and regional context.

3.10 Terrain and Soils

3.10.1 Baseline Information

[A] Describe and map the terrain and soils conditions in the Project Area.

[B] Describe and map soil types in the areas that are predicted to exceed Potential Acid Input critical loading criteria.

3.10.2 Impact Assessment

[A] Describe project activities and other related issues that could affect soil quality (e.g., compaction, contaminants) and:
a) indicate the expected amount (ha) of surface disturbance from the Project and associated infrastructure;
b) discuss the relevance of any changes for the local and regional landscapes, biodiversity, productivity, ecological integrity, aesthetics and future use;
c) identify the potential acidification impact on soils and discuss ~~describe~~ the significance of predicted impacts by acidifying emissions; and
d) describe potential sources of soil contamination.

[B] Discuss:
a) the environmental effects of proposed drilling methods on the landscape and surficial and bedrock geology;
b) the potential for changes in the ground surface during steaming and recovery operations (e.g., ground heave and/or subsidence) and their environmental implications; and
c) the potential impacts caused by the mulching and storage of woody debris considering, but not limited to, vulnerability to fire, degradation of soil quality, increased footprint.
d) proposed mitigation strategies to reduce use and need for chemicals (such as herbicides) & fertilizers in reclaimed lands associated with oil sands developments (i.e., pipeline rights-of-way, oil sands exploration disturbances, access roads, in situ well pads)

3.11 Land Use and Management

3.11.1 Baseline Information

[A] Describe and map the current land uses in the Project Area, including all Crown land dispositions and Crown Reservations (Holding Reservation, Protective Notation, Consultative Notation) and Aboriginal traditional land-use.

[B] If known, indicate where Crown land dispositions may be needed for roads or other infrastructure for the Project

[C] Identify and map unique sites or special features such as Parks and Protected Areas, Heritage Rivers, Historic Sites, Environmentally Significant Areas, cultural landscapes, Aboriginal land-use sites and other designations (e.g., World Heritage Sites, Ramsar Sites, Internationally Important Bird Areas).

[D] Describe and map known land clearing activities, showing the timing of the activities.

[E] Describe the status of timber harvesting arrangements.

[F] Describe existing access control measures.

[G] Make any data layers created through mapping processes available to the public as Shapefiles and KML files.

3.11.2 Impact Assessment

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

a) unique sites or special features;
b) changes in public access arising from linear development, including secondary effects related to increased hunter, angler and other recreational access ;
c) aggregate reserves that may be located on land under the Proponent's control and reserves in the region; describe potential impacts of climate change to commercial forest harvesting and fire management and identify climate change adaptation strategies;
d) development and reclamation on commercial forest harvesting and fire management in the Project Area;
e) the amount of commercial and non-commercial forest land base that will be disturbed by the Project, including the Timber Productivity Ratings for the Project Area. Compare the baseline and reclaimed percentages and distribution of all forested communities in the Project Area;
f) how the Project impacts Annual Allowable Cuts and quotas within the Forest Management Agreement area;
g) the operations of any agricultural crown leases and provincial grazing reserves;
h) anticipated changes (type and extent) to the topography, elevation and drainage patterns within the Project Area; and
i) access control for public, regional recreational activities, Aboriginal land use and other land uses during and after development activities.

[B] Describe how Integrated Land Management will be considered (e.g., sharing of infrastructure, access requirements). Describe how Aboriginal communities were consulted and engaged in identifying Integrated Land Management strategies for maintenance of traditional land use areas.

[C] Describe how other Aboriginal land uses were used to establish an Access Management Plan that will minimize potential project impacts.

[D] Provide a wildfire control plan highlighting:

a) measures taken to ensure continued access for firefighters to adjacent wildland areas;
b) forest fire prevention, detection, reporting, and suppression measures, including proposed wildfire equipment;
c) measures for determining the clearing width of power line rights-of-way; and
d) required mitigation measures based on the *FireSmart Field Guide for the Upstream Oil and Gas Industry*.
e) Demonstrated engagement with Aboriginal communities, Regional Municipality of Wood Buffalo, and other key stakeholders.
f) Identify stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discuss the potential impacts over the life of the Project. Provide monitoring plans to check for such variability and indicate mitigations in such case.

4 HISTORIC RESOURCES

4.1 Baseline Information

[A] Provide an overview of the regional historical resources setting including a description of the relevant archaeological, historic and palaeontological records.

[B] Describe and map known historic resources sites in the Project Area, considering:

a) site type and assigned Historic Resources Values; and
b) existing site specific *Historical Resources Act* requirements.

[C] Provide an overview of previous Historical Resources Impact Assessments that have been conducted within the Project Area, including:

a) a description of the spatial extent of previous assessment relative to the Project Area, noting any assessment gap areas; and
b) a summary of *Historical Resources Act* requirements and/or clearances that have been issued for the Project to date.

[D] Identify locations within the Project Area that are likely to contain previously unrecorded historic resources. Describe the methods used to identify these areas. Seek specific input from Aboriginal communities. Describe proposed mitigation measures to avoid or reduce impacts to historic resources, whether previously identified or discovered in the course of project impact identification and planning.

[E] Identify locations within the Project Area that are likely to contain historic resources based upon traditional land-use information and traditional knowledge.

4.2 Impact Assessment

[A] Describe project components and activities that have the potential to affect historic resources at all stages of the Project.

[B] Describe the nature and magnitude of the potential project impacts on historical resources, considering:

a) effects on historic resources site integrity; and

b) implications for the interpretation of the archaeological, historic and palaeontological records.

5 TRADITIONAL ENVIRONMENTAL KNOWLEDGE, LAND USE AND CULTURAL IMPACTS

5.1 Baseline Information

[A] Provide a pre-development baseline (mid-1960s) of traditional land-use and cultural heritage.

a) Provide: a cultural impact assessment that determines the extent of the potential project impacts for each Aboriginal group identified through project consultation. This should include a specific assessment for McMurray Métis and Métis Nation of Alberta Members in Fort McMurray;

b) a map and description of traditional land use areas including fishing, hunting, trapping, nutritional, medicinal, cultural plant harvesting and other areas of interest to Aboriginal peoples (if the Aboriginal community or group is willing to have these locations disclosed);

c) a map of cabin sites, spiritual sites, cultural sites, graves and other traditional use sites traditional trails and resource activity patterns considered cultural resources and/or historic resources under the *Historical Resources Act* (if the Aboriginal community or group is willing to have these locations disclosed; and

d) a discussion of:

i) the availability of vegetation, fish and wildlife species for food, traditional, medicinal and cultural purposes in the identified traditional land use areas considering all project related impacts, and access to traditional lands in the Project Area during all stages of the Project.

ii) Folllowing the recommendations from the CEMA ITKF, describe how Traditional Environmental Knowledge and Traditional Land Use information was incorporated into the Project design, EIA development, the conservation, reclamation (including Indigenous views on land reclamation), monitoring and mitigation plans. If other constraints limited the ability to use recommendations based in Traditional Environmental Knowledge, please explain the accommodation efforts agreed to with each affected community.

Describe how the adaptive management model will include Traditional Environmental Knowledge and Traditional Land-Use information into the project at all development and reclamation phases.

5.2 Impact Assessment

[A] Determine the direct, indirect and cumulative impacts of the Project on traditional, medicinal and cultural purposes and identify possible mitigation strategies.

[B] Develop a plan to identify, monitor, mitigate and accommodate potential project impacts to Indigenous rights and traditional land-use.

6 PUBLIC HEALTH AND SAFETY

6.1 Public Health

[A] Describe aspects of the Project that may have implications for public health and quality of life or the delivery of regional health services. Determine quantitatively whether there may be implications for public health arising from the Project.

[B] Document any health concerns including mental health and stress raised by stakeholders and Aboriginal communities during consultation on the Project.

[C] Complete a cumulative effects assessment that determines whether the new project will have incremental impact on communities, particularly Aboriginal communities.

[D] Document any health concerns identified by Aboriginal communities resulting from impacts of existing development and of the Project, considering direct and indirect impacts to health, community wellness and culture. Include an Aboriginal receptor type in the assessment.

[E] Describe how perceived impacts to traditional resources might have a negative impact on the community.

[F] Describe the potential health impacts resulting from higher regional traffic volumes and the increased risk of accidental leaks and spills.

6.2 Public Safety

[A] Describe aspects of the Project that may have implications for public safety. Specifically:

a) describe the emergency response plan including public notification protocol and safety procedures to minimize adverse environmental effects, including emergency reporting procedures for spill containment and management;
b) document any safety concerns raised by stakeholders during Project consultation;
c) describe how local residents including those actively using the land (e.g. while hunting, fishing, gathering etc.) will be contacted during an emergency and the type of information that will be communicated to them;
d) describe the existing agreements with area municipalities or industry groups such as safety cooperatives, emergency response associations, regional mutual aid programs and municipal emergency response agencies; and
e) describe the potential safety impacts resulting from higher regional traffic volumes.
f) Document safety concerns raised by Aboriginal communities; include concerns raised in relation to traditional land-use.
g) Develop an emergency response plan in partnership with Aboriginal communities.

7 SOCIO-ECONOMIC ASSESSMENT

7.1 Baseline Information

[A] Describe the existing socio-economic conditions in the region and in the communities in the region.

[B] Describe the existing socio-economic conditions in the region's Aboriginal communities, completing project specific socio-economic assessments in partnership with communities. This should include a specific socio-economic assessment of the McMurray Métis and Métis Nation of Alberta card holders in Fort McMurray.

Delete

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[C]

[D] Describe factors that may affect existing socio-economic conditions including:

a) Identify the pre-development baseline socio-economic conditions;
b) population changes;
c) workforce requirements for all stages of the Project, including a description of when peak activity periods will occur;
d) planned accommodations for the workforce for all stages of the Project. Discuss the rationale for their selection;
e) the Proponent's policies and programs regarding the use of Aboriginal, local, regional and Alberta goods and services;
f) the project schedule; and
g) the overall engineering and contracting plan for the Project

7.2 Impact Assessment

[A] Describe the effects of construction and operation of the Project and its cumulative impact to existing socioeconomic conditions in the region including:

a) Aboriginal culture (e.g. traditional land-use and social, cultural, economic and political implications);
b) housing; including housing for First Nations and Métis residents of the RMWB
c) availability and quality of health care services; including availability and quality of health care services for First Nations and Métis residents;
d) local and regional infrastructure and community services; including local and regional infrastructure and community services for First Nations and Métis residents;
e) recreational activities; including recreational activities for First Nations and Métis residents;
f) hunting, fishing, trapping and gathering.

[B] Describe the socio-economic effects of any new or existing camp(s) required for the Project and identify:

a) its location;
b) the number of workers it is intended to house;
c) whether the camp will service the Project only or other clients;
d) the length of time the camp will be in service;
e) describe the services that will be provided in the camp (e.g., security, recreation and leisure, medical services), including a description of the impacts on Municipal or other external services; and
f) outline the emergency services and evacuation plan that will be in place;
g) How the project could be constructed without new camp infrastructure.

[C] Describe opportunities to work with First Nation and Métis communities and groups, other local residents and businesses regarding employment, training needs and other economic development opportunities arising from the Project.

[D] Describe how work with Aboriginal communities will be measured, monitored and evaluated for the life of the project;

[E] Describe how work with Aboriginal communities will be measured, monitored and evaluated between communities (how will the benefits to one community be measured against the benefits to another).

[F] Provide the estimated total project cost, including a breakdown for engineering and project management, equipment and materials, and labour for both construction and operation stages. Indicate the percentage of expenditures expected to occur in each Aboriginal community, the region, Alberta, Canada outside of Alberta, and outside of Canada.

[G] Explain whether Suncor plans to develop a social procurement strategy that will benefit not-for-profit and local socially minded businesses

8 MITIGATION MEASURES

[A] Discuss mitigation measures planned to avoid, minimize or eliminate the potential impacts for all stages of the Project.

[B] Discuss how Suncor will address project impacts to Aboriginal rights and s. 35 rights

[C] Identify the mitigation objectives for each associated impact and describe those mitigation measures that will be implemented. Provide rationale for their selection, including the effectiveness of the proposed mitigation.

[D] Describe how Suncor will engage Aboriginal communities in the development, implementation and monitoring of the effectiveness of mitigation measures for addressing impacts to Aboriginal traditional land uses.

[E] For impacts to Aboriginal communities, explain Suncor's process for working with the community to mitigate and accommodate those impacts.

9 RESIDUAL IMPACTS

[A] Describe the residual and cumulative residual impacts of the Project following implementation of Suncor's mitigation measures and Suncor's plans to manage those residual and cumulative impacts.

[B] Describe how Suncor will engage Aboriginal communities to manage residual impacts to Aboriginal traditional land uses and cultural practices.

10 MONITORING

[A] Describe Suncor's current and proposed monitoring programs, including:

a) how the monitoring programs will assess project impacts and measure the effectiveness of mitigation plans. Discuss how Suncor will address project impacts identified through the monitoring program;
b) how the adaptive management approach implemented by Suncor will be evaluated and modified based on monitoring data and how Aboriginal communities will be involved in evaluation of the effectiveness of the adaptive management approach;
c) how the monitoring programs will include community-based monitoring components;
d) How the monitoring programs will include traditional knowledge;
e) how Suncor will contribute to current and proposed regional monitoring programs;

f) monitoring performed in conjunction with other stakeholders, including Aboriginal communities and groups;
g) new monitoring initiatives that may be required as a result of the Project;
h) regional monitoring that will be undertaken to assist in managing environmental effects and improve environmental protection strategies;
i) how Aboriginal communities will be provided opportunities to obtain certification as Aboriginal Monitors (i.e., Alberta Innovates' Aboriginal Environmental Services Network Aboriginal Monitor Training Program) and be involved in design, delivery and analysis of monitoring programs;
j) how Aboriginal communities will be provided opportunities to develop monitoring programs specific to evaluating mitigation measures implemented to address impacts to traditional land uses and cultural practices;
k) how monitoring data will be disseminated to the public, Aboriginal communities or other interested parties; and
l) how the results of monitoring programs and publicly available monitoring information will be integrated with Suncor's environmental management system.