

DETAILED
PROJECT DESCRIPTION

For the
PRAIRIE LIGHTS POWER PROJECT

REFERENCE NUMBER

80324

Project Location
35 km south of Grande Prairie, Alberta

Proponent

PRAIRIE LIGHTS POWER LIMITED PARTNERSHIP



Submitted to
IMPACT ASSESSMENT AGENCY OF CANADA

DOCUMENT COMPLETED BY



McCallum Environmental Ltd.

March 3, 2020

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LIST OF ACRONYMS

AAAQO	Alberta Ambient Air Quality Objectives
ACE	Air Contaminant Emissions
ACIMS	Alberta Conservation Information Management System
ACO	Aboriginal Consultation Office
ACMSW	Alberta Culture, Multiculturalism and Status of Women
ADC	Aseniwuche Development Corporation
AESO	Alberta Electric System Operator
AEP	Alberta Environment & Parks (formerly ESRD)
AER	Alberta Energy Regulator
AGENCY	Impact Assessment Agency
AMD	Air Monitoring Directive
AQA	Air Quality Assessment
ASETS	Aboriginal Skills and Employment Training Strategy
AUC	Alberta Utilities Commission
AVC	Animal Vehicle Collisions
AWA	Alberta Wildlife Act
AWN	Aseniwuche Winewak Nation
BATEA	Best Available Technology Economically Achievable
BLIERS	Base-level Industrial Emission Requirements
BMP	Best Management Practice
CAAQS	Canadian Ambient Air Quality Standards
CANFOR	Canadian Forest Products Ltd.
CASA	Clean Air Strategic Alliance
CCIR	Carbon Competitiveness Incentive Regulation
CEAA	Canadian Environmental Assessment Act
CEMS	Continuous Emissions Monitoring
CERP	Core Emergency Response Plan
CMSW	Culture, Multiculturalism and Status of Women
CO₂	Carbon Dioxide
COO	Chief Operating Officer
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CTG	Combustion Turbine Generator
CWS	Canadian Wildlife Service
DARS	Data Acquisition and Report generating system
dBA	A-weighted decibels
DC	Direct Current
DLN	Dry Low NOx

DML	Miscellaneous Lease
DSAAC	Draft Strategic Assessment of Climate Change
ECCC	Environment and Climate Change Canada
EEA	Environmental Effects Assessment
EM	Environmental Monitor
EO	Element Occurrence
EPEA	Environmental Protection and Enhancement Act
ESA	Environmentally Significant Area
ESRD	Alberta Environment and Sustainable Resource Development
FWIMT	Fish and Wildlife Internet Mapping Tool
FWMIS	Fisheries and Wildlife Management Information System
GHG	Greenhouse Gas
GIS	Geographic Information System
GSU	General Step-up
GW	Gigawatt
GWh	Gigawatt hours
GWP	Global Warming Potential
HR	Historical Resources
HRIA	Historical Resources Impact Assessment
HRMB	Historical Resources Management Branch
HRSG	Heat Recovery Steam Generator
IAAC	Impact Assessment Agency of Canada
IBA	Important Bird Area
IG	Indigenous Group
km	kilometres
kV	kiloVolt
LAT	Landscape Analysis Tool
LCOE	Levelized cost of electricity
LFE	Large Final Emitters
LP	Low pressure
LSD	Legal Sub-Division
LTO	Long Term Outlook
m	metre
m³	Cubic metre
mbg	Metres below ground
MD	Municipal District
MEL	McCallum Environmental Ltd.
MBCA	Migratory Birds Convention Act

MW	Megawatt
N	North
NGPG	Natural gas power generation
NGTL	Nova Gas Transmission
NIA	Noise Impact Assessment
NO_x	Nitric Oxide
NO₂	Nitrogen Dioxide
NAD83	North American Datum of 1983
NE	Northeast
O₂	Oxygen
OHV	Off Highway vehicle
OHSA	Occupational Health and Safety Act
OPaC	Online Permitting and Clearance
OSB	Oriented Strand Board
PAZA	Peace Airshed Zone Association
PIP	Participant Involvement Program
PLA	Pipeline Agreement
PLPLP	Prairie Lights Power Limited Partnership
PLPP	Prairie Lights Power Project
PM_{2.5}	Particulate matter less than 2.5 microns in diameter
PSL	Permissible Sound Level
RAP	Restricted Activity Period
REGULATIONS	<i>Information and Management of Time Limits Regulations</i>
SAR	Species at Risk
SARA	Species at Risk Act
SCR	Selective Catalytic Reduction
SMP	System Marginal Price
SO₂	Sulphur Dioxide
SOCI	Species of Conservation Interest
SOI	Solicitation of Interest
STG	Steam Turbine Generator
SW	Southwest
TBD	To Be Determined
TCPL	TransCanada Pipeline Ltd.
TIER	Technology Innovation and Emissions Reduction
TL	Transmission Line
TSP	Total Suspended Particulate
UTM	Universal Transverse Mercator
VEC	Valued Ecosystem Components

W6M	West of the sixth meridian
WCSB	Western Canada Sedimentary Basin

1 INTRODUCTION

On November 18, 2019, Prairie Lights Power Limited Partnership ('PLPLP') submitted a Project Description (with accompanying materials) of a Designated Project for the Prairie Lights Power Project (the Project) (reference # 80324) to the Impact Assessment Agency of Canada (the Agency). The Agency conducted a consultation period from November 22, 2019 to December 12, 2019, inviting participants to provide feedback related to the submission.

Issues noted during that consultation period, were subsequently summarized by the Agency in a Summary of Issues document, provided to PLPLP on December 20, 2019. The Summary of Issues document is provided in Appendix C.

Pursuant to subsection 15(1) of the Impact Assessment Act, PLPLP is providing the Agency with this Detailed Project Description that sets out how PLPLP intends to address the issues in the Summary of Issues and includes the information described in the Information and Management of Time Limits Regulations (the Regulations).

1.1 PROJECT UPDATE

As a result of the Summary of Issues and potential concerns with water withdrawal and fisheries impacts on the Smoky River, PLPLP has reviewed the potential water sources for the raw source water. As the IAA is aware, the initial proposal included trucking water into the site from a pre-existing water source sump used for well fracking / drilling currently owned and operated by Hammerhead Resources. An AEP Water Act license would have been required to receive source freshwater from the HHR point of water diversion on the Smoky River at NE 31-067-04W6M, with a point of use/storage for the PLPP from the HHR water storage reservoir location SW 35-067-04W6M. The source location of the diversion on the Smoky River is already approved and in operation by HHR. Even though no new infrastructure would be required at the Smoky River, PLPLP has now eliminated this as a water source option for the PLPP. Going forward, the PLPP will source water from existing industrial water sources in proximity to the Project, under existing water licences. No water sources will include water withdrawal from any fish bearing watercourses, including the Smoky River. Therefore, there is no infrastructure required within or adjacent to the Smoky River, and there will be no interaction between the PLPP and the Smoky River, or its tributaries, and therefore no potential impact, adverse or otherwise, on the Smoky River.

PART A: UPDATED GENERAL INFORMATION

2 PROJECT NAME, TYPE AND PROPOSED LOCATION

PLPLP is proposing to permit, construct and operate a 360-Megawatt ('MW') Combined Cycle Power Project. The Project is known as the Prairie Lights Power Project ('PLPP').

2.1 TYPE OF PROJECT

The PLPP is a combined cycle plant that will be fueled using natural gas and will generate electricity from a "one-on-one" configuration consisting of one combustion turbine generator (CTG), one heat recovery steam generator (HRSG) and one steam turbine generator (STG).

Natural gas for the Project will be supplied from a new dedicated pipeline.

Two double circuit 144kV transmission line will provide electrical interconnection between the plant and the existing Big Mountain 845S substation.

The approximate installed generation capacity in Alberta in 2015 was 16,526 MW with coal-fired generation and natural gas-fired generation contributing 38% and 44%, respectively (Doluweera, et al., 2018). Historically, power production in Alberta is dominated by coal. In 2015, coal-fired units produced 67% of electricity in Alberta. Due to coal dominance, GHG intensity of power generation in Alberta is the highest among Canadian provinces (Doluweera, et al., 2018).

The PLPP represents an opportunity for PLPLP to realize the vision of providing a cost-effective, long-term and stable electrical supply to the Alberta market.

The Prairie Lights Power Project major goals to ensure a successful project are:

- Health and Safety - Maintain a "best in class" health and safety program exceeding the minimum requirements of occupational health and safety.
- Environment - Environmental impacts kept to a minimum and consistently striving for improvements.
- Reliability – Ensure the most reliable facilities are designed and erected.
- Budget - Capital costs within approved "do not exceed" budgets.
- Schedule – Establish a realistic and achievable project schedule consistently trying to improve upon.

- Quality Assurance – Establish a quality management plan that meets industry standards and ensure a strong organizational commitment to quality throughout the project.
- Plant Performance - Complies with PLPLP operational mandate.
- Support local and regional (Aboriginal and non-Aboriginal) businesses in the project area as much as possible.

The Project provides Alberta with a viable option to assist the transition from coal power plants. When compared to coal, combined cycle plants emit significantly fewer emissions of carbon dioxide (CO₂), sulfur dioxide (SO₂), nitrogen oxide (NO_x) and other air emissions.

The location for the Project was selected based on proximity to natural gas supply; demand for electricity and available export grid capacity; adequate acreage; minimum number of neighbors to avoid noise inconvenience; access to site and road load capacity; and other environmental factors.

2.2 PROJECT LOCATION

The PLPP is located about 35 km south of Grande Prairie, Alberta, within the Municipal District of Greenview #16. (Figure 1. PLPP Location)

The site is just northeast of the Canadian Forest Products Ltd. (Canfor) 2000 Road turnoff from Alberta Highway 40.

The Project is located in Legal Subdivisions (LSD) 5 and 12, Section 3, LSD 8 and 9, Section 4, Township 68, Range 5, West of the 6th Meridian.

Centre of Project lands located at:

- Latitude 54°51'25.64"N
- Longitude 118°41'12.00"W
- Easting 391720.77 m E (Zone 11U)
- Northing 6080217.41 m N (Zone 11U)

The PLPP lands encompass approximately 20.6 hectares and the lands were clearcut in the last 5 years.

2.3 PURPOSE OF THE PROJECT

The purpose of the Prairie Lights Power Project is to provide a clean, reliable, cost-effective source of new electricity supply to the Alberta Interconnected Electric System, to help reduce greenhouse gas emissions by reducing transmission line losses from the Alberta grid, and to help enhance the local and regional reliability of power supply. The Alberta Electric System Operator (“AESO”) has outlined in its 2019 Long Term Outlook (“LTO”), the need for approximately 4300 MW of new gas fired combined cycle power generation in Alberta by 2034. The need for this capacity has 3 main drivers:

- 1) Replacement for the approximately 5700MW of existing coal fired capacity, including the provision for transitional coal to gas conversions.
- 2) Reliable, high efficiency low emission thermal generation to enable the addition of renewable power generation that has intermittent production profiles.
- 3) Incremental supply for expected load growth additions, net of energy efficiency measures.

The amount and pace of generation development is affected by technology costs, government policy, upcoming coal plant retirement decision and profitability expectations, among other factors. Alberta’s competitive electricity market determines the amount of private sector generation investment required to reliably meet demand, and the 2019 AESO LTO provides a view of what generation is expected to develop and where¹.

The Prairie Lights Power Project proponents have determined the proposed plant location has the following benefits:

- a) Location is adjacent to area gas production that provides ample low cost supplies of natural gas.
- b) Electrical interconnection to the AESO to support an area of relatively weak transmission system capacity, as evidenced by relatively high loss factors. The size of the Prairie Power plant is constrained by the demand for electric power in the region and by the ability to transmit the power via the existing power distribution system. A study was done in conjunction with AESO to determine the largest, practical size.
- c) Incremental area environmental impacts are minimized as the project is adjacent to existing industrial activities, and relatively distant to local populations.

¹ <https://www.aeso.ca/assets/Uploads/AESO-2019-LTO-updated-10-17-19.pdf>

- d) Selection of highly efficient combined cycle technology with aerial cooling minimizes air and water impacts compared to less efficient and higher emission power generation elsewhere in the province.
- e) Project construction and operation creates economic and employment opportunities, including for Indigenous Peoples, at a time when the people of Alberta need such opportunities.
- f) Engagement with Indigenous groups has revealed that no historical use or culturally sensitive areas are expected to be affected by the PLPP to date. However, engagement with the listed Indigenous groups will continue.
- g) By using existing roads for all access, no new public access is being created to previously undisturbed areas.
- h) Using existing disturbed areas and existing transmission and pipeline corridors results in no expected adverse effects to flora and fauna.

Environmental laws and policies affect the economics and incentives of electricity market participants. In addition to the current legislation and regulations, there are a number of federal and provincial initiatives and policies which were considered by the project proponents.

The Government of Canada published the following regulation in the Canada Gazette, Part II, on Dec. 12, 2018:

Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity (2018) provides CO₂ emission intensity standards for natural gas-fired electricity². These regulations cover new gas-fired units and coal-fired units that are converted to run on natural gas.

The Prairie Lights Project represent an incremental emissions and economic advantage as compared to coal to gas conversions, potentially advancing the date whereby the current coal operators may retire their less efficient, higher emission generation.

The Alberta Government announced the Technology Innovation and Emissions Reductions (TIER) regime for large industrial emitters in Alberta will be effective Jan. 1, 2020. Under this proposed system, large final emitters (LFEs) in the electricity sector will be required to meet a “good-as-best gas” performance standard. The TIER

² <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/technical-backgrounder-regulations-2018.html>

Fund will be implemented to help companies reduce emissions with cleaner technology.

The technology selected for the Prairie Lights Project is consistent with the “good-as-best gas” performance standard and are expected to be consistent with Provincial and Federal Environmental standards as they continue to evolve.

The Environmental and Technology benefits of the project, coupled with the other local area economic and electric system advantages, represents a robust environmental and economic solution to Alberta’s evolving electricity energy needs.

3 PROPONENT & PROJECT INFORMATION

Table 1. Proponent Information

Name of the Designated Project	Prairie Lights Power Project
Name of the Proponent	Prairie Lights Power Limited Partnership
Address of the Proponent	525 8 Ave SW Suite 2700, Calgary, AB T2P 1G1
President and CEO	Scott Rennie srennie@prairielights.ca p. 1-855-930-0560
Principal Contact Person	Greg Belostotsky Staff Facilities and Pipelines Specialist gbelostotsky@prairielights.ca Main: (855) 930-0560 24-Hour Emergency Response: (877) 431-5716
Primary Representative for the Detailed Project Description	Robert McCallum President McCallum Environmental Ltd. robert@mccallumenvironmental.com p. 902-446-8252

Figure 1. PLPP Location

Prepared For:

Prairie Lights Power LP

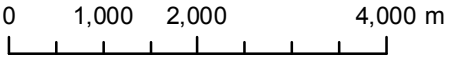
FIGURE 1

Prairie Lights Power Plant Location

 Project Area



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter



1:80,000 Scale when printed @ 11" x 17"

Drawn By: John R. Gallop Date: 2019-04-04



McCallum Environmental Ltd.



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3.1 ANCILLARY FACILITIES

3.1.1 NATURAL GAS PIPELINE

A 6 inch natural gas steel pipeline will run south from the PLPP, approximately 2200 metres to the existing Nova Gas Transmission (NGTL) pipeline branch. The pipeline will run through Section 3, Township 68, Range 5 and Section 34, Township 067, Range 05, W6M. The exact pipeline routing has not yet been surveyed. The route, once surveyed, will be assessed and permitted as per Alberta Energy Regulator (AER) requirements. This will include an assessment of environmental site conditions.



Figure 2. Pipeline route

3.1.2 TRANSMISSION LINE

Design and construction of the new transmission line and expansion of the Big Mountain substation to accommodate the new transmission line will be done by ATCO and/or by a

separate contractor. The Big Mountain substation is located just south of Grande Prairie and 24 km north of the plant. An existing transmission line right-of-way runs north-south between the plant site and the Big Mountain substation. The new transmission line for the power plant will be installed adjacent to the existing right of way parallel to the existing transmission line. Three options for a new transmission line for the power plant have been assessed. No determination on the preferred and alternate routes has been decided at this time.

The three potential Transmission Line (TL) line routes were selected by desktop analysis and then assessed in the field as potential route options, however only one approved by the Alberta Utilities Commission (AUC) will be constructed. The preferred route will run north from the PLPP, through the following lands:

- Sections 3, 10, 15, 22, 27, 33, Township 68, Range 5, W6M
- Sections 4, 9, 17, 20, 29, 32, Township 69, Range 5, W6M
- Sections 5, 8, 17, Township 70, Range 5, W6M

3.2 ALTERNATIVES TO THE PROJECT AND ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

3.2.1 PROJECT LOCATIONS

Alternative locations for the Project site were initially identified from aerial photographs and site reconnaissance. Both the surveyed location and a number of alternate locations were evaluated to determine which siting would have the least impacts on operational design, environmental features, and existing infrastructure and existing land use. The evaluation of project locations considered:

- Good existing access
- Avoidance of areas that were unique or potentially sensitive to disturbance
- Avoidance of disturbance to areas with large concentrations of salvageable timber
- Minimization or avoidance of fish and wildlife conflicts
- Utilization of existing clearings
- Minimization of disturbance to natural drainage patterns
- Avoidance of areas with permanent residences
- Allowance to meet noise setbacks as regulated by the Alberta Utilities Commission (AUC)

- Proximity to the Alberta Interconnected Electric System with grid capacity to receive the expected power output from the PLPP
- Proximity to existing natural gas fuel supply
- Avoidance of lands with known historical resource values
- Avoidance of areas that were likely to have traditional use or current use by Indigenous Groups (as determined by land use at the time of siting)

Considering the above noted preliminary characteristics, the proposed location was chosen as it minimizes the impacts as noted above.

3.2.2 PROJECT TECHNOLOGY

PLPLP undertook a detailed technology screening to identify numerous potential technologies that were initially considered feasible for project execution. The study considered 11 different gas turbine engine configurations, open cycle, combined cycle, etc... This study concluded that a 1x1x1 GTG/HRSG/STG configuration, with an “F-class” gas turbine, such as the Siemens SGT6-5000F, would best meet the objectives.

A Technology Selection study was done using Thermoflow GTPRO and PEACE estimating software. Thermoflow is the leading thermal engineering design and simulation software for the power and cogeneration industries. Thermoflow’s comprehensive software suite has a vast, built-in knowledge base of current performance and financial data, allowing the designer to optimize a new power plant both technically and economically.

While water is available, power plants based on dry air-cooling were thought to minimize the permitting effort and potential environmental concerns around water use. Air-cooling would penalize steam turbine performance slightly, especially during hot weather however it eliminates the need for much of the water handling equipment. Therefore, it was decided to do further analyze cost and financial performance for both wet and dry, a total of four configurations, again using the Thermoflow PEACE cost estimating software. Financial input assumptions were held consistent between the four variations.

Therefore, through detailed engineering and financial feasibility analysis it was determined the Project as proposed represents the best technically and economically feasible option.

3.2.3 TECHNICAL ALTERNATIVES TO THE PROJECT - UPDATED

PLPLP has not identified any potential alternatives to the Project that are technically or economically feasible. The Project is a standalone project to provide electricity to the Alberta

Interconnected Electric System. Capacity access at the electrical grid is the single largest limiting factor to the location and power output design of the Project. In addition, the Project requires both land access to the source gas, and an adequate supply of source gas, to provide energy inputs to the facility.

In order to supply the stated power of 360MW to the electrical grid, a number of additional alternatives the project have been considered but are not feasible for the reasons as follows:

1. Wind Power – Although turbine sizes and outputs vary, assuming a typical turbine energy output of 4 MW, would require approximately 85 turbines to supply the necessary energy. Assuming a 1 hectare x 1 hectare turbine footprint, the resulting surface disturbance from the turbines would be 85 hectares. Additionally, setbacks between turbines due to wake loss and turbulence from blades while they are in operation. Generally, a five (5) times rotor diameter setback distance may be required in the prevailing wind direction between turbines, and a minimum three (3) times rotor diameter setback distance may be required perpendicular to the prevailing wind direction between turbines to limit effects of wake loss and turbulence. Assuming a 100 metre rotor diameter, this would place the distance between turbines at 500m. For connection of roads and underground or overhead collector lines, this would increase the level of disturbance by an additional 85 hectares (500 m of road x 20 m wide x 85 turbines). Thus, the total disturbance for a wind project of a comparable size is approximately 170 hectares, which is 150 hectares larger than the current disturbance. More importantly, an appropriate wind resource to make the Project economically viable is required. Turbine locations are selected based on the wind resource that is specific to the Project lands from validated wind measurements. The collection of site-specific data for wind speed and direction are crucial to determining site potential. Wind resource mapping and data from meteorological towers would be required over multiple years to identify optimal wind resource areas within the original land base. This would allow for effective placement of the turbines to maximize power generation from the wind resource for the Project based upon expected energy outputs within the modeled wind resource.
2. Solar Power: Similar to wind power projects, a number of factors need to be considered for a successful solar project. These include an appropriate solar regime to make the Project economically viable, the presence of adequate land base for placement of solar panels and associated infrastructure; relatively level topography with minimal existing right-of-ways and easements; and the ability to place solar panels to meet regulatory setbacks. Using a recent solar project approved by the AUC in Alberta (Brooks Solar II Project, AUC Decision #: 24573-D01-2020), the Brooks Solar II project required 96 hectares of land to generate 36 MW of Direct Current (DC) energy. Using this estimated land base, the PLPP would then require 960

hectares of land. In this region, all land is forested and would therefore require extensive clearing for infrastructure placement.

The most significant constraint to the alternative use of wind or solar power in this area is the regulatory environment. Currently, Alberta does not have regulations that allow renewable energy to be permitted on Crown Land. As the PLPP is located on Crown Land, and is only surrounded by Crown Land, there is no regulatory mechanism to support renewable energy alternatives to the PLPP in this operating region.

3. Nuclear Power: Currently there are no active nuclear power plants in Alberta. The regulatory and financial uncertainty, in addition to the technical expertise requirements, are outside the scope and function of PLPLP and this is not a feasible option for PLPLP.

3.2.4 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

Prior to final siting and design of the PLPP, considerable effort was placed on determining potential alternative means for delivery of power using natural gas to the Alberta EG. The following considerations were used to determine the final project and ultimately eliminate alternate means of carrying out the Project.

PLPLP considered the proximity of the PLPP to both the transmission system and the gas pipeline system and weighed project economics and other technical and environmental considerations on an optimal placement of the PLPP:

- The length of the incoming gas pipeline was minimized. Other pipeline tie-in locations were considered but the distance to tie-in locations was greater than the current proposal. This would have also increased costs and impacts associated with transmission and development of new access.
- Proximity to the existing transmission line and the Big Mountain substation. The proximity to the substation was key as the electrical generation capacity of the PLPP (360MW) needs to be available at the substation for interconnection to the grid. The availability of existing substations to support the PLPP power inputs is a constraining factor for the location of the PLPP and a primary reason for the current location as presented.
- Good existing road access provided by Highway 40 and existing secondary roads significantly reduces construction, transportation and operational costs and impacts.

- Good existing rail access for transportation of large components for the PLPP. The proximity to the existing and active Gold Creek rail siding reduces transportation costs.
- Using existing disturbance (i.e. existing cut block) significantly reduces potential conflicts with other land users and environmental features.
- The PLPP potential raw water volume use, and subsequent wastewater volumes was reduced by deciding to use an air cooling system instead of a water cooling system. While water is available, power plants based on dry air-cooling would minimize the permitting effort and potential environmental concerns around water extraction from the Smoky River. Air-cooling would penalize steam turbine performance slightly, especially during hot weather however it eliminates the need for much of the water handling equipment. Therefore, it was decided to do further analyze cost and financial performance for both the GE and Siemens, each both wet and dry, a total of four configurations, again using the Thermoflow PEACE cost estimating software.
- The final configuration eliminated the need for raw water ponds and significantly reduced the required water volumes for operations. This use of an air cooled system increased the overall PLPP costs by approximately \$10,000,000 but PLPLP deemed the reduction in water use as a fundamental operating commitment.

The PLPP as proposed was approved by the AUC and granted Prairie Lights Power LP the approval Power Plant Approval 24758-D02-2019 – October 30, 2019. (Refer to Appendix M - AUC Approval & Decision). In the decision the AUC indicated in *Section 4 – Findings*, the AUC assessed whether the project is in the public interest, having regard to its social, economic and environmental effects. The AUC has previously found that the public interest will be largely met if an application complies with existing regulatory standards, and the project’s public benefits outweigh its negative impacts. The AUC considered the application having regard to the applicable legislative and regulatory framework and found that the project is in the public interest having regard to its social, economic and environmental effects.

As the AUC has granted provincial approval, considering further alternative means would require completion of a new application to both the AUC and AEP. Given the AUC has determined that the Project is in the public interest, further alternative means to carry out the project are no longer being considered.

3.2.5 ALTERNATIVES TO THE NATURAL GAS SUPPLY

In order to fuel the PLPP, natural gas will be supplied from a new dedicated pipeline from the ATCO Grande Prairie Mainline (refer to Section 1.1.1.1 above). However, an additional option to build a pipeline and take gas off the existing TCPL Gold Creek compressor station located 2.5 km southeast of the plant site in NW-26-067-05W6M was considered. This option was eliminated due to the technical challenges associated with the numerous road and pipeline crossings to meet the TCPL compressor location, which also results in increased financial risk.

Several factors were taken into consideration when identifying route options in an effort to find routes with the lowest overall impact. Key factors that were taken into consideration include:

- Environmental impacts of a proposed route based upon initial desktop review, followed by field assessments to further identify a route with a lesser environmental impact.
- Cost

Criteria for evaluating potential route options included the following:

- Minimizing wildlife and environmental impacts
- Minimizing encroachment on existing and planned oil and gas infrastructure
- Minimizing line-length and total capital cost
- Minimizing additional disturbances for road and access construction
- Minimizing impacts to Indigenous groups and land use.

Desktop GIS data from a variety of sources was used to analyse preliminary route options and was supplemented by on-site visits to evaluate constraints within the study area.

3.2.6 TRANSMISSION LINE OPTIONS

Three potential Transmission Line ('TL') line routes were selected by desktop analysis and subsequent field assessments for environmental and social features (i.e. housing) as potential route options, however only the preferred route will be applied for to the various regulatory agencies.

Several factors were taken into consideration when identifying route options in an effort to find routes with the lowest overall impact. Key factors that were taken into consideration include:

- Avoiding residential areas and/or individual homes along Highway 40 as per Option 2 in the following table.
- Environmental impacts of a proposed route based upon initial desktop review, followed by field assessments to further identify a route with a lesser environmental impact.
- Electrical
- Cost
- Input from stakeholders engaged during the provincial regulatory application processes.
- Potential visual impacts

Criteria for evaluating potential route options included the following:

- Minimizing wildlife and environmental impacts
- Minimizing encroachment on existing and planned oil and gas infrastructure
- Minimizing line-length and total capital cost
- Minimizing additional disturbances for road and access construction
- Minimizing impacts on landowners and agricultural operations
- Minimizing impacts to Indigenous groups and land use.

Desktop GIS data from a variety of sources was used to analyse preliminary route options and was supplemented by on-site visits to evaluate constraints within the study area.

Existing linear disturbances were considered as potential parallels for a new transmission right of way as an option to minimize the impact from new disturbances.

3.2.6.1 Consideration of Route Impacts

Preference was given to routes that avoided close proximity to residences in order to minimize impacts on residents in the vicinity of the project.

Primary land use in the study area is predominantly forestry and oil and gas. Some areas are also heavily disturbed by existing oil and gas facilities, including oil wells, natural gas wells, pipelines, lease roads, and overhead power distribution lines. Routes were evaluated to maintain acceptable distances from the interconnection line to existing oil and gas

infrastructure. Concerns about potential corrosion issues were raised and addressed during consultation, in cases where the proposed interconnection transmission line parallels existing pipelines.

Sensitive environmental features including wetlands, wildlife and protected areas were also considered.

Cost was considered at an indicative level to minimize:

- The required kilometres of transmission line
- The associated construction costs
- The preferred location for the termination of the interconnection transmission line at the proposed Halsbury wind substation location
- Existing and future access costs for construction and maintenance.

After evaluation of route impacts a preferred route was selected based on the results of this consultation and based on further evaluation of the routes, including the considerations summarized above.

3.2.6.2 Detailed and Final Routing

The final preferred transmission line route is viable from a technical and constructability standpoint, meets the requirements identified in the AESO NID and Functional Specification, and represents a low impact and low cost alternative for the project.

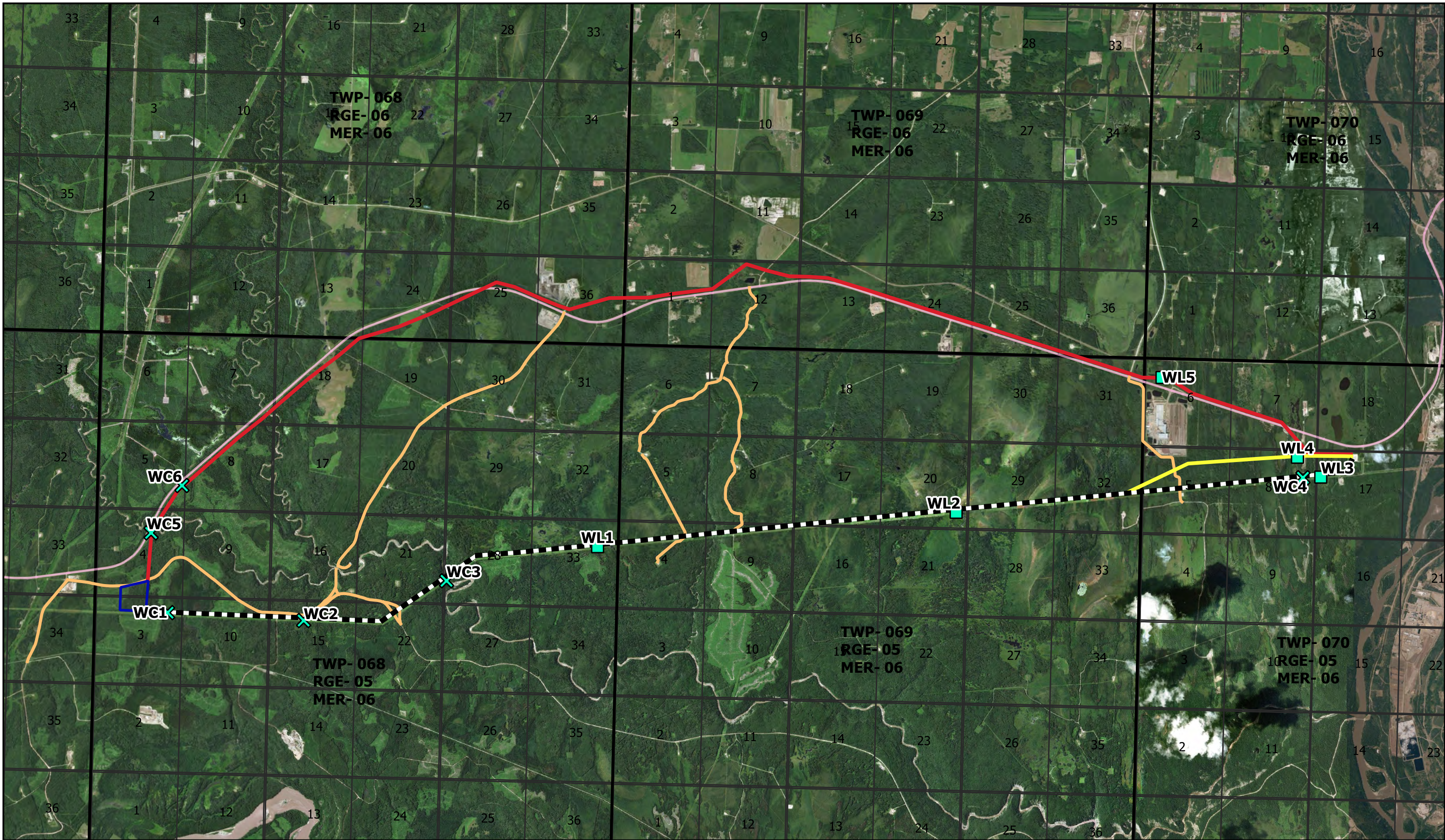
Table 2 provides a summary of the Project route options.

Table 2. TL Options Description

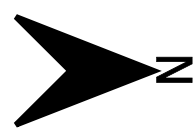
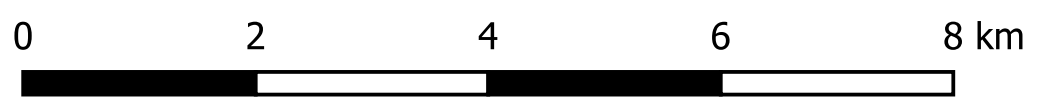
Specification	Preferred Route	Option 1	Option 2
Approximate Right-of-Way width (m)	50	50	50
Approximate Right-of-Way length (m)	23,018	23,017	25,947
Approximate Right-of-Way area (hectares)	115	115	130
Approximate route length adjacent to existing disturbance (m)	23,018	18,682	24,747











Specification	Preferred Route	Option 1	Option 2
Type of adjacent existing disturbance	Existing high voltage transmission line	Existing high voltage transmission line. 4,300 metres of new cut	Highway 40
Estimated Number of Watercourse Crossings	8	8	8
Estimated Number of Wetland Crossings	14	14	
Number of road crossings	7	7	8 (includes crossing Highway #40 twice)
Number of Pipeline Crossings	11	11	16
Private Land Crossed	No	No	Yes
Risks	At the northern end of the route, the TL line infringes upon a setback for a Trumpeter Swan Buffer.	Route results in increased linear disturbance and wildlife habitat fragmentation.	Option 2 encounters existing Ainsworth Oriented Strand Board (OSB) plant, approximately 3km south of existing Substation. This requires the TL to cross Highway #40 twice. TL option encounters 8 private residences within 400 metres at intersection of highway #40 and secondary road 690.

Figure 3. Transmission Line Route Options



Project: Prairie Lights
 Spatial Reference: NAD 1983 UTM Zone 11 U
 Scale: 1 : 65,000

 Wetland	 Option 1	 Access	 TWP
 Watercourse	 Option 2	 Hwy 40	
 Preferred Route	 Station	 SEC	

3.2.6.2.1 Preferred Route

- Route follows existing transmission line corridor for 100% of the length.
- Option leaves the proposed Power Plant on the west side and heads north adjacent to the existing TL line.
- Route allows for potential overlap of construction access with existing TL.
- This route option was discussed with AEP. AEP indicated that the preference for new disturbance is to following existing disturbance to the greatest extent possible.
- AEP is also aware that this route will infringe upon the 500m setback of a Trumpeter Swan lake. AEP indicated that if the preferred route follows the existing TL on the west side, the impact to setback is already in place with the existing TL. AEP indicated that there would the requirement for placement of bird markers along this 1700 metre section of line but had no other concerns or mitigation requirements at this time.
- The transmission line from the PLPP to the Big Mountain 845S substation will be a single double circuit 144 kV overhead transmission line on a wooden H frame structure.

3.2.6.2.2 TL Option 1

- This option deviates from the existing TL route approximately 4000 metres south of the existing substation.
- The deviation was proposed to maintain the setback to the Trumpeter Swan Lake to the east of the route.
- This option to deviate was discussed with AEP. AEP indicated the preference is to follow existing disturbance and the placement of the TL between the Highway #40 and the existing TL further fragments habitat. Even though it would be placed outside the Trumpeter Swan buffer, the increased fragmentation of habitat was considered the less desirable option.

3.2.6.2.3 TL Option 2

- This option follows highway #40 for 95% of the length.

- Option leaves the Power Plant from the east side and crosses over a high-grade gravel road, and then to Highway #40, before turning north along the east side of the highway. The east side is maintained for approximately 8,000 metres due to the presence of a Trumpeter Swan setback on the west side of the highway.
- The TL will then cross highway 40.
- The west side of the highway was chosen as the preferred side of the highway due to the presence of oil and gas infrastructure, private dwellings, the Ainsworth OSB plant and agricultural land use that would increase the setback from Highway 40 on the east side. If the east side of the highway was used, the TL would be setback from the highway up to 500 metres in various locations, resulting in increased habitat fragmentation.
- There is project risk associated with the presence of private dwellings in proximity to the TL Option 2 at the intersection of highway 40 and secondary road 690, as follows:
 - 6 residences within 200 metres;
 - 1 residence at 350 metres;
 - 1 residence at 400 metres;
 - 5 residences at 600 metres;
 - 9 residences greater than 600 metres;
- Due to existing infrastructure along the west side of highway 40, the TL cannot parallel the road and must have kinks and doglegs to go around existing industrial and residential disturbances.

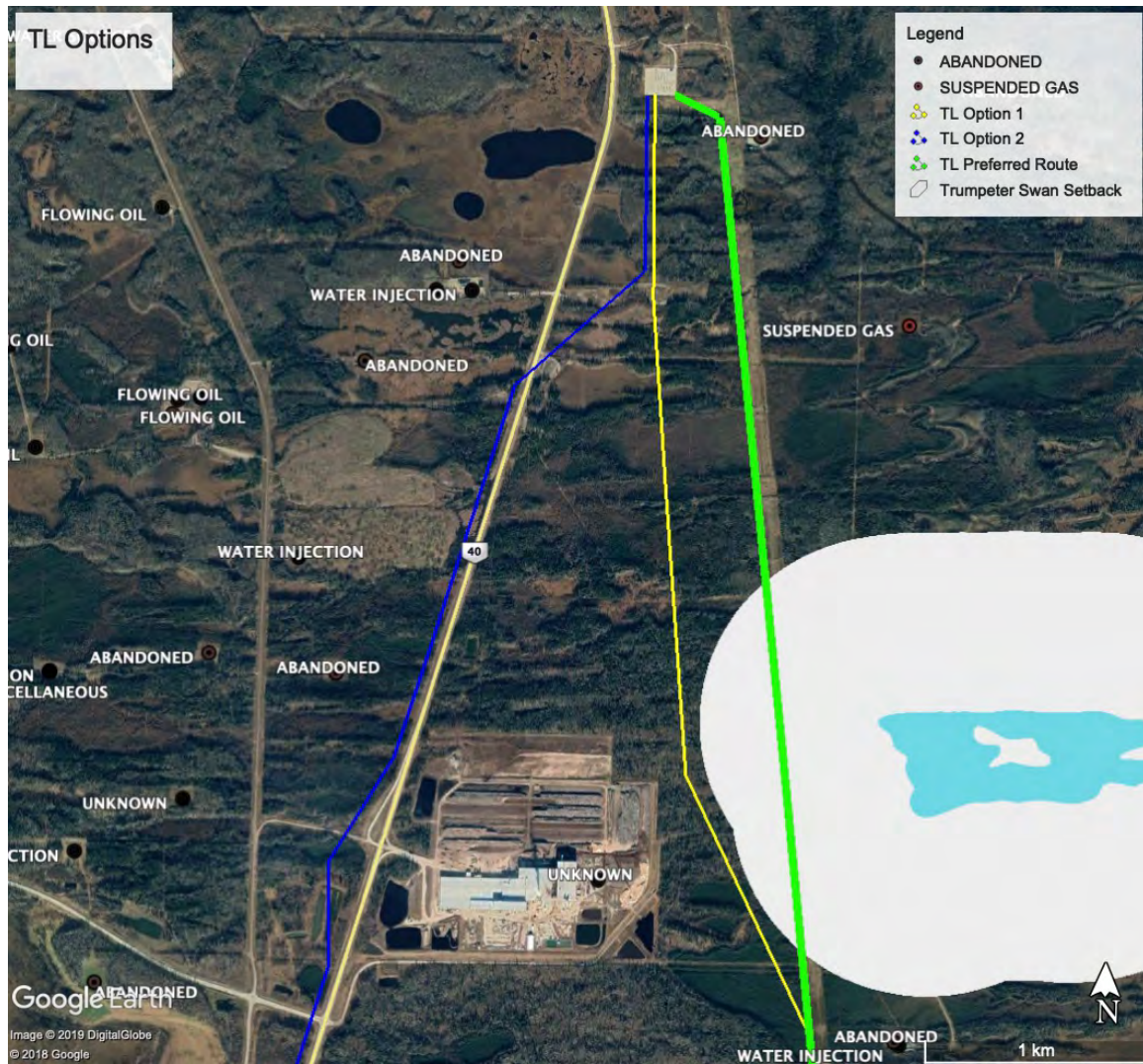


Figure 4. Northern end of transmission line

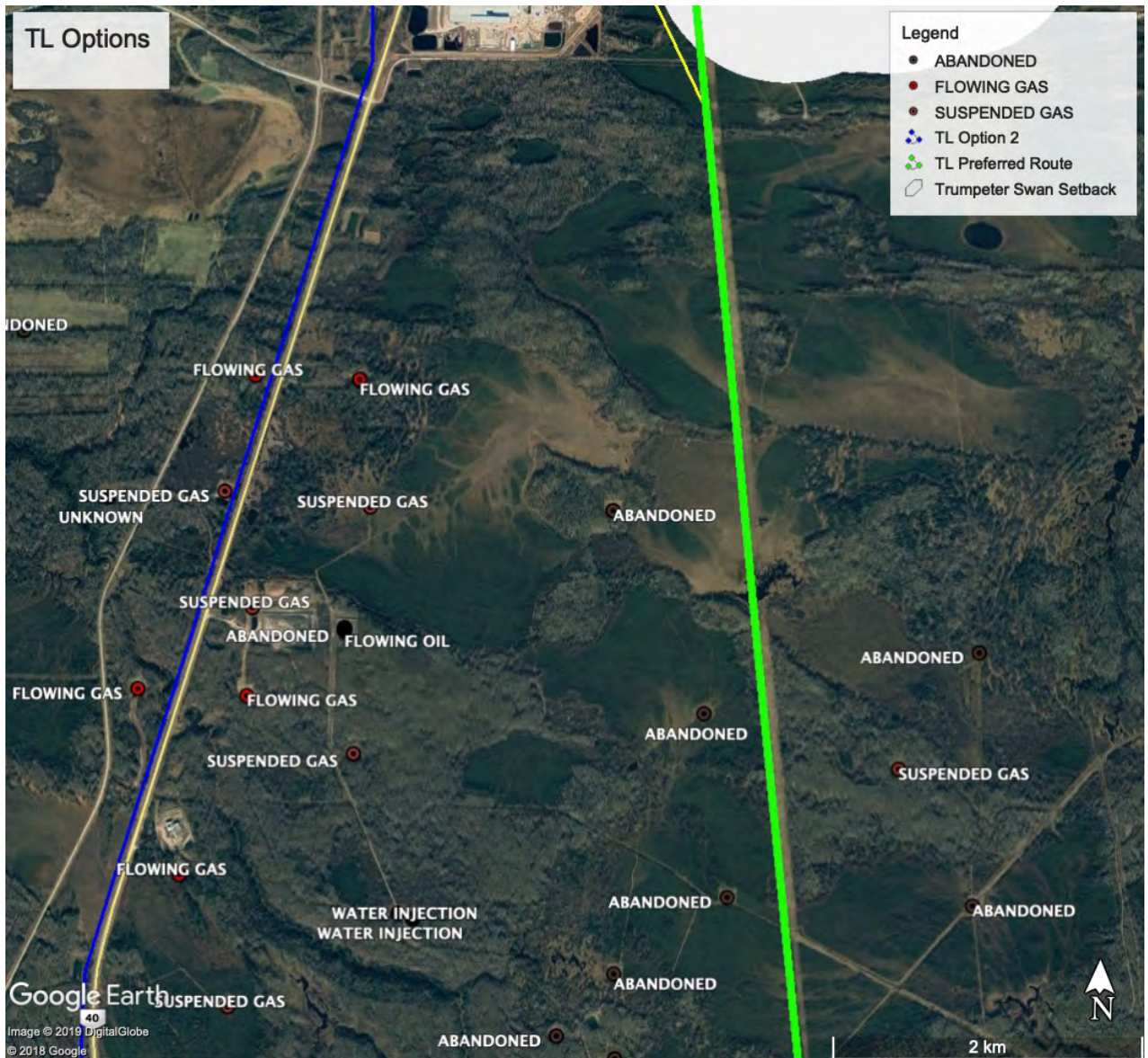


Figure 5. Transmission line south of OSB Plant

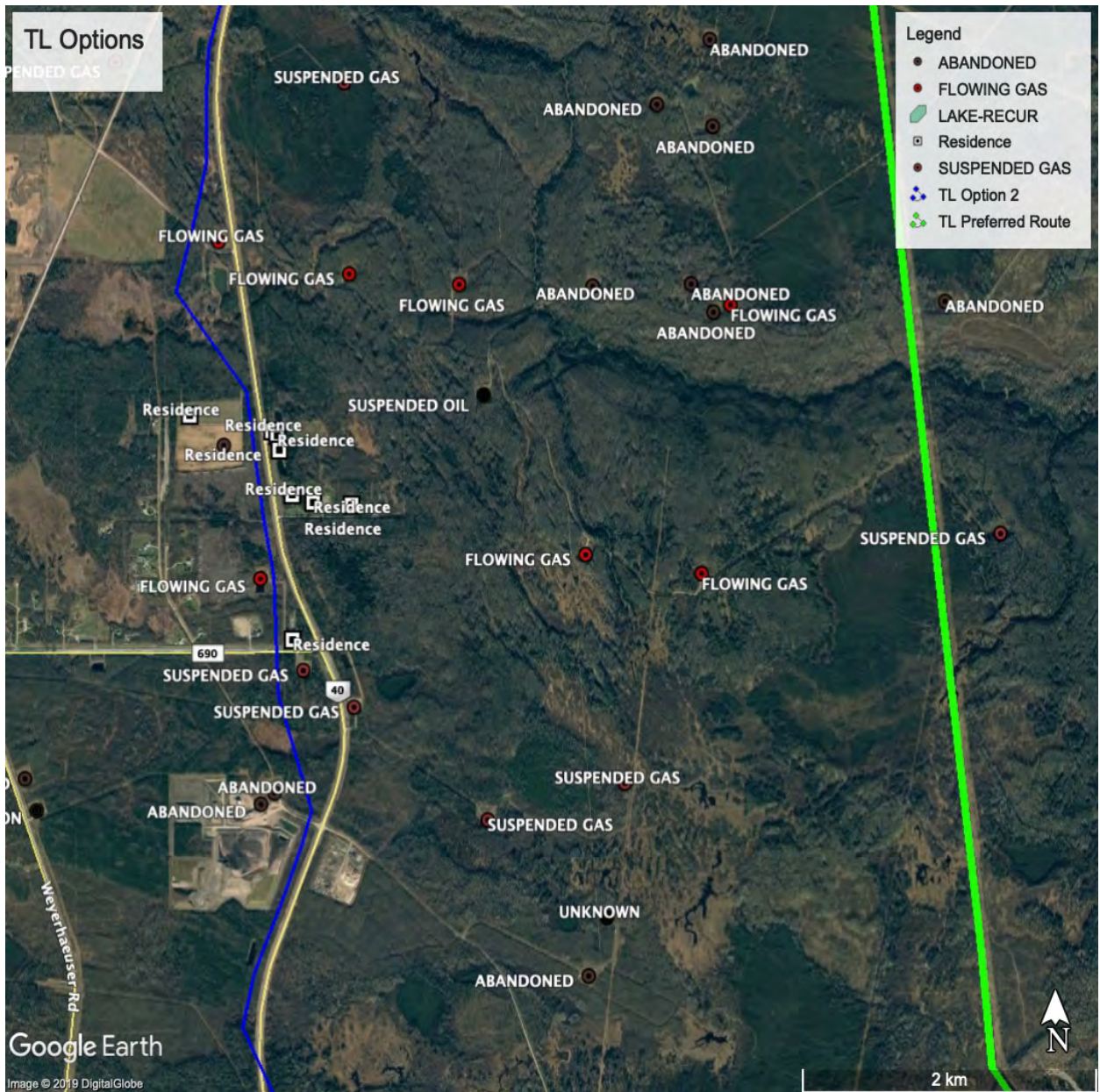


Figure 6. Central portion of transmission line

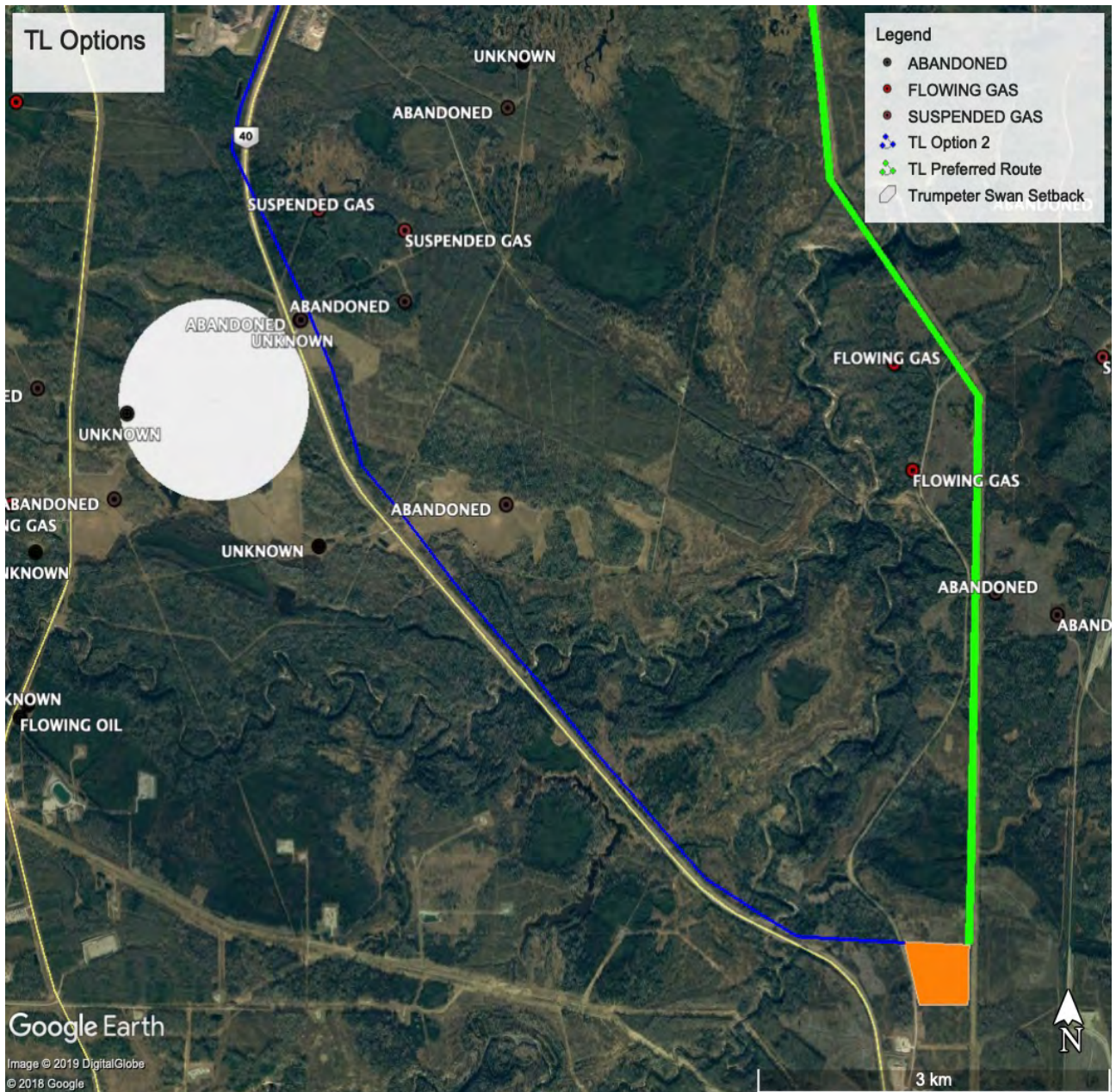


Figure 7. Transmission line from power plant

3.3 LIST OF PARTIES AND REGULATORY AGENCIES CONSULTED

The following lists provincial regulatory agencies, municipal agencies, stakeholders, Indigenous Peoples, or other industries consulted or requiring regulatory applications.

Federal

1. Impact Assessment Agency of Canada (IAAC)

Provincial

1. Alberta Energy Regulator
2. Alberta Environment and Parks, Operations and Provincial Approvals
3. Alberta Environment and Parks, Industrial Approvals
4. Alberta Environment and Parks, Land Use Area, Lands Division
5. Alberta Culture, Multiculturalism and Status of Women
6. Alberta Utilities Commission
7. Alberta Economic Development, Trade and Tourism
8. Alberta Transportation – Highways and Roadside Planning Section
9. Alberta Transportation – Transportation and Civil Engineering

Municipal

1. Municipal District of Greenview #16

Indigenous Groups

Treaty 8 Indigenous Peoples

- Duncan's First Nation
- Driftpile First Nation
- Horse Lake First Nation
- Kapawe'no First Nation
- Sawridge First Nation
- Sturgeon Lake Cree Nation

- Sucker Creek First Nation
- Swan River First Nation

Metis

- Gift Lake Metis Settlement
- East Prairie Metis Settlement
- Métis Nation of Alberta (in Region 6; near Region 4)
- Kelly Lake Metis Settlement Society / Metis Community Society of Kelly Lake
- Kelly Lake Leadership Group

Non-Treaty Indigenous Groups

- Aseniwuche Winewak Nation
- Foothills Ojibway First Nation
- Kelly Lake Cree Nation
- Kelly Lake First Nation
- Foot Hills First Nation

Public Consultation

Consultation occurred with landowners, occupants, residents, agencies, and industrial interest holders whom may potentially be impacted by the proposed Project within a minimum of 2000 m from proposed facilities. This was completed to satisfy the public consultation requirement of the AUC as outlined in Rule 007.

In addition, following review of the PLPP by AEP for the Industrial Approval and once the application is deemed complete, AEP will post public notices requesting public comments on the Project.

Industry Consultation

1. 1505440 Alberta Ltd.
2. ATCO Electric Ltd.

3. Alliance Pipeline Ltd.
4. Atco Gas and Pipelines Ltd. (South)
5. Canadian Natural Resources Limited
6. Devco Developments Corp.
7. Mainline Construction
8. Manitok Energy Inc.
9. Norbord Inc.
10. North Coast Ready Mix Ltd.
11. Nova Gas Transmission Ltd.
12. Petronas Energy Canada Ltd.
13. Recover Energy Services Inc.
14. Semcams ULC
15. Shell Canada Limited
16. Strong Pine Energy Services Inc.

3.3.1 ONGOING ENGAGEMENT

PLPLP is committed to keeping consultation with landowners, municipalities, Indigenous groups and all affected stakeholders ongoing. PLPLP's objective is to provide notification and engage in consultation with affected stakeholders regarding the progress of the Project during all stages of development.

PLPLP will continue to maintain the relationships it has built with its stakeholders as the Project moves forward, and should the Project be approved, PLPLP will continue to engage with stakeholders through construction and operation of the Project, as they believe this will result in a better Project and long-term involvement in the region.

3.4 REGULATORY REQUIREMENTS OF MUNICIPAL & PROVINCIAL JURISDICTIONS

The following provides a summary of the provincial or municipal regulatory permitting requirements for the PLPP, listed by regulatory agency.

1. Alberta Environment and Parks (AEP):
 - a. On April 4, 2019 a Project Summary Table and Project Report, including location figures were provided by email to Alberta Environment and Parks, Operations, Provincial Approvals, requesting a review to determine if an Environmental Impact Assessment report is required for the proposed Prairie Lights Power Project. AEP indicated in their response “that pursuant to Section 44 of the *Environmental Protection and Enhancement Act* (EPEA), I have considered the application of the environmental assessment process to your proposed Prairie Lights Power Project LP, Prairie Lights Power Project. This activity is not a mandatory activity for the purposes of environmental assessment. Having regard to the consideration set out in Section 44(3) of EPEA, I have decided that further assessment of the activity is not required. Therefore, a screening report will not be prepared, and an environmental impact assessment report is not required.” Please refer to *Appendix J - AEP Correspondence re. EIA Requirement* for a copy of the correspondence.
 - b. Under the *Environmental Protection and Enhancement Act* Approval is required to construct, operate and reclaim the Project, and is to be issued by AEP under the *Activities Designation Regulation (276/2003) (2) (vv)* “power plant” means a plant that produces steam or thermal electrical power and has a rated production output of greater than one megawatt under peak load. Therefore, for the purposes of *Activities Designation Regulation - Division 2* of Schedule 1, the Power Project will require an authorization under the *Alberta Activities Designation Regulation*. As such PLPLP is making an application to Alberta Environment and Parks for approval of the Power Project in accordance with the *Guide to Content for Industrial Approval Applications* (August 1, 2013). PLPLP has completed the application as per the requirements outlined within the *Guide to Content for Industrial Approval Applications: New, Renewal and Amendment, dated June 2, 2014*. The approval of the Project has a 10 year approval limit, at which time, a renewal application will be required. Furthermore, any changes to the Project, over the lifetime of the Project, require submission and approval of an amendment application.

- c. AEP Operations Division crown land approval for Miscellaneous Lease (DML), which authorizes a commercial use under a miscellaneous lease. This application includes an assessment of environmental site conditions and Indigenous Group consultation.
 - d. AEP Operations Division crown land approval for an Easement (EZE), which authorizes a commercial use for the Transmission Line. This application includes an assessment of environmental site conditions and Indigenous Group consultation.
 2. Alberta Culture, Multiculturalism and Status of Women (ACMSW): The Project lands are listed as Historical Resource Value 5, Categories Archaeological, Paleontological, which require regulatory review and clearance to proceed. Therefore, a Historic Resources (HR) Application was submitted to the Historical Resources Management Branch for review under the *Historical Resources Act*, to determine whether a Historical Resources Impact Assessment (HRIA) for archaeology or paleontology is required.
 3. Alberta Utilities Commission (AUC): As the Project will be providing electrical energy to the provincial power grid, on July 23, 2019, PLPLP submitted an application to the Alberta Utilities Commission pursuant to Section 11 of the *Hydro and Electric Energy Act*, c H-16, R.S.A. 2000 (the HEEA), as amended. PLPLP will also applied to the AUC for connection of the Power Project to an electric distribution system pursuant to Section 18 of the HEEA. Submissions were completed as per the requirements in AUC Rule 007- Applications for Power Plants, Substations, Transmission Lines, and Industrial System Designations. The program includes engagement with the public (e.g., local landowners), Indigenous groups, government agencies, municipalities, industry, association and special interest groups. In addition to the environmental evaluation, the AUC required a Noise Impact Assessment and mitigation measures implemented, as necessary, for the Project to comply with AUC Rule 012, Noise Control. Pursuant to sections 11 and 19 of the Hydro and Electric Energy Act, the AUC approved and granted Prairie Lights Power LP the approval- Power Plant Approval 24758-D02-2019 – October 30, 2019. (Refer to Appendix M - AUC Approval & Decision). In the decision the AUC indicated in Section 4 – Findings, the AUC assessed whether the project is in the public interest, having regard to its social, economic and environmental effects. The AUC has previously found that the public interest will be largely met if an application complies with existing regulatory standards, and the project’s public benefits outweigh its negative impacts. The AUC considered the application having regard to the applicable legislative and

regulatory framework and found that the project is in the public interest having regard to its social, economic and environmental effects.

4. Alberta Energy Regulator (AER) approval for a pipeline agreement (PLA), which authorizes a commercial use for the gas pipeline. This application includes an assessment of environmental site conditions and Indigenous Group consultation.
5. Municipal District (MD) of Greenview #16: The MD will issue a development permit for the PLPP. The same public information package that was sent to landowners, occupants and residents was sent to the MD. The MD requires a land title, site plan and development permit application to be filled out with a Letter of Authority for the DML. A development permit application will be submitted later in 2019 once the DML is approved.

3.4.1 PROVINCIAL ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The applications to AEP and AUC follow a prescribed table of contents that require environmental evaluations of the Project, including the description of mitigation measures. The information required by AEP in the environmental evaluation of the Project is listed in the *Environmental Protection and Enhancement Act Guide to Content for Industrial Approval Applications* (GOA 2014). It includes:

- a description of the current setting and condition of the environment;
- the current ambient air quality of the Project Area (for the PLPP as 12 km x 12 km area was considered);
- current soil survey of the site and surrounding lands, including land capability, suitability for reclamation and local and regional vegetation, including rare plants;
- nature and condition of wildlife in the area, including the species and their habitats, and identification of any sensitive species and special habitat description and evaluation of any proposed receiving watercourses;
- wastewater and runoff treatment and control;
- completion of an air quality assessment report;
- air treatment and control mechanisms;
- environmental risks and mitigation during construction;

- environmental objectives during operation and environmental management systems; and,
- reclamation objectives and a conceptual reclamation plan.

The information required in the environmental evaluation of the Project by AUC included a prediction of the Project's effects on the environment and the measures to avoid or mitigate the Project's predicted adverse environmental effects and any monitoring proposed to evaluate the efficacy of those measures. Specifically, the environmental evaluation included:

- a description of the existing environmental and land use conditions in the local study area;
- the identification and description of the Project activities and infrastructure that may adversely affect the environment;
- the identification of what specific ecosystem components (i.e., terrain and soils, surface water bodies and hydrology, groundwater, wetlands, vegetation species and communities, wildlife species and habitat, aquatic species and habitat, air quality and environmentally sensitive areas) within the local study area may be adversely affected by the Project;
- the description of the potential adverse effects of the Project on the ecosystem components during the life of the Project;
- the description of the mitigation measures the applicant proposes to implement during the life of the Project to reduce these potential adverse effects;
- the description of the predicted residual adverse effects of the Project and their significance after implementation of the proposed mitigation;
- the description of any monitoring activities proposed to implement during the life of the Project to verify the effectiveness of the proposed mitigation; and,
- the description of the methodology used to identify, evaluate and rate the adverse environmental effects and determine their significance, along with an explanation of the scientific rationale for choosing this methodology.

3.5 PREVIOUS REGIONAL ENVIRONMENTAL STUDY

According to the Impact Assessment Act Registry³ the PLPP is not taking place in an area with a previously completed regional environmental assessment.

As of September 9, 2019, the AEP Land-use Framework, Regional Plans website⁴ indicated that the Upper Peace Region Land Use Plan has not started the Land Use planning process.

3.5.1 PROJECT EXPANSION

The Project is a new facility and neither a component of, nor expansion of, another project.

4 PROJECT INFORMATION

4.1 PROPOSED DEVELOPMENT

PLPLP is proposing to permit, construct and operate a 360MW Power Project located about 35 km south of Grande Prairie, Alberta, within the Municipal District of Greenview #16. This is a stand-alone Project and is not a component of a larger project that is listed in the *Physical Activities Regulations*: SOR/2019-285.

The Project is located on previously forested provincial crown land. The PLPP is located in LSDs 8, 9, Section 4, and LSDs 5, 12, Section 3, Township 68, Range 5, West of the 6th Meridian. Access to the location is from Highway 40, connecting to the Canfor Forestry Road, for 100 metres, and then north onto a secondary low-grade gravel road, which is located along the west boundary of the PLPP. The PLPP lands encompass 20.6 hectares.

The location was selected based on proximity to natural gas supply; demand for electricity and available export grid capacity; adequate acreage; minimum number of neighbors to avoid noise inconvenience; access to site and road load capacity; and other environmental factors.

For example, the numerous environmental factors included the fact the current land use at the PLPP is forestry harvesting. The PLPP lands appeared to have been logged in the past, approximately 5 years ago and are currently undergoing natural re-growth. At the time of

³ <https://www.ceaa.gc.ca/050/evaluations/exploration?culture=en-CA>

⁴ <https://www.landuse.alberta.ca/RegionalPlans/UpperPeaceRegion/Pages/default.aspx>

on site assessment, waste wood piles were still present on location and no re-planting had occurred. There are no watercourses within the boundary of the PLPP. The closest watercourse is located approximately 650 metres north of the PLPP, with no direct connection to PLPP lands. There are no wetlands within the boundary of the PLPP and none immediately adjacent that would be affected. The closest wetland is located approximately 400 metres north of the PLPP. No unique habitat is present on the PLPP lands. No vegetation species at risk were identified and no unique species at risk habitat is present.

The PLPP is a combined cycle plant that will be fueled using natural gas and will generate electricity from a “one-on-one” configuration consisting of one combustion turbine generator (CTG), one heat recovery steam generator (HRSG) and one steam turbine generator (STG). The steam turbine will be a condensing type using an air-cooled condenser rather than a water-cooled surface condenser. The air-cooled condenser mitigates the need for either large reliable water source with availability year-round or large storage pond.

The PLPP will generate electricity from natural gas to provide a reliable source of electricity to help meet the growing demand of electricity in Alberta, and support the transition from coal power plants, which are nearing retirement in Alberta. When compared to coal, combined cycle plants emit significantly fewer emissions of carbon dioxide (CO₂), sulfur dioxide (SO₂), nitrogen oxide (NO_x) and other air emissions. CO₂ emissions from combined cycle facilities are less than half that of coal fired plants.

Combined cycle power facilities are comprised of a combination of both gas and steam power production. The combined cycle power facility uses natural gas as a fuel to produce power in a gas-turbine generator and then utilizes the waste energy from the exhaust in a Heat Recovery Steam Generator (HRSG) to produce steam, which drives the steam-turbine generator.

In order to fuel the PLPP, natural gas will be supplied from a new dedicated pipeline from the ATCO Grande Prairie Mainline, located 2.2 km south of the PLPP. The pipeline will be owned and operated by PLPLP.

In addition to the power generating components, other Project components will consist of fuel gas treatment components, generator step-up transformers, associated power distribution modules, and the demineralized water treatment facility with associated storage tanks.

The raw source water for PLPP operations will be trucked into the PLPP site from a pre-existing industrial supplier.

Water use volumes are currently estimated at 32.8 m³ / day = 11,984 m³ / year. Water will be stored on site in a tank to provide a water for services at the facility. Makeup water for the steam cycle will come from raw water processed at the plant to meet the purity requirements of the steam generator. Alternatively, makeup water may be processed off site and trucked in by a water treatment service. Process water discharge is estimated to be 11.2 m³ / day.

A single double circuit 144kV transmission line will provide electrical interconnection between the plant and the existing Big Mountain 845S substation. Design and construction of the new transmission line and expansion of the Big Mountain substation to accommodate the new transmission line will be done by ATCO and/or by a separate contractor. The Big Mountain substation is located just south of Grande Prairie and 24 km north of the plant. An existing transmission line right-of-way runs north-south between the plant site and the Big Mountain substation. The new transmission line for the Power Project will be installed adjacent to the existing right of way parallel to the existing transmission line. Three options for a new transmission line for the Power Project have been assessed.

4.2 PHYSICAL ACTIVITY

The PLPP is a physical activity as defined in the *Physical Activities Regulations: SOR/2019-285, Schedule, 30* “The construction, operation, decommissioning and abandonment of a new fossil fuel-fired electrical generating facility with a production capacity of 200 MW or more.”

As the Project is anticipated to have a maximum production capacity of 360 MW (360 MW net is both nominal rating and maximum due to limiting constraints on the transmission line and at the downstream substation) the threshold defined in item 2(a) would be exceeded.

PLPLP is therefore required to submit a project description to the Impact Assessment Agency to inform the decision as to whether an environmental assessment is required. As such, the Project is considered a designated physical activity under the Regulations.

4.3 COMPONENTS AND ACTIVITIES

4.3.1 PHYSICAL WORKS

As the purpose of the plant is to generate electricity as required to meet power grid demands, the major process of the plant is electrical power generation. The equipment layout is provided in Figure 8 (below) and a visual representation of the PLPP is provided in Figure 9 (below). Visual impacts will be minor in nature, given the rural location, the lack of residents to the and the distance from the public highway #40.

4.3.1.1 Size of the Designated Project Lands

The Project lands encompass 20.581 hectares. The Project footprint of actual infrastructure has been minimized to the greatest extent possible. The Project will require construction of a pad, approximately 225 m x 300 m in size (6.75 hectares). The PLPP infrastructure footprint only represents 28% of the entire surface lease area. (Appendix D - Survey Plan)

4.3.1.2 Buildings and Enclosures

The following lists the expected buildings or enclosures at the PLPP.

Table 3. Buildings and Enclosures

Name	Type
Administration/Warehouse/Control	Building
Turbine House	Building
Water Treatment	Inside Turbine House
Condensate Polishing	Inside Turbine House
Switchyard Electrical	Enclosure
ACC Electrical Power Distribution Centre	Enclosure
Diesel Engine/Generator	Enclosure
CEMS	Enclosure
HRSG	Doghouse
Firewater pump(s)	Enclosure
Potential other equipment enclosures	Enclosure

4.3.1.3 Equipment

The table below shows the total quantity of major equipment installed. A comprehensive equipment list is provided in Appendix L - Equipment List.

Table 4. Major equipment

Major Equipment	Installed
Air Cooled Condenser	1
Auxiliary Boiler	1
Boiler Feedwater Pumps	2
Closed Cooling Water Heat Exchanger	1
Closed Cooling Water Pumps	2
Combustion Turbine Generator	1
Condensate Extraction Pumps	2
Condensate Polisher	2
Diesel Generator	1
Fuel Gas Filter/Separator	2
Fuel Gas Knockout Drum	1
Fuel Gas Performance Heater	1
Heat Recovery Steam Generator	1
Pumps, typically	2
Tanks, typically	1

Major Equipment	Installed
Service/Instrument Air Compressor	2
Steam Jet Air Ejectors	3
Steam Turbine Generator	1

For a complete list of physical facilities on the PLPP please refer to Figure 8. General Equipment Arrangement

4.3.1.4 Access

Road access to the plant is by Highway 40, 44.4 km south of Grande Prairie. Turn east onto the Canfor 2000 high grade gravel road. Access then turns north, 100 metres from highway 40. Turn north 970 metres to SW corner of Power Project lands. The PLPP will be laid out with good vehicle accessibility by a perimeter road looping the entire plant. Numerous vehicle entrances to buildings branch off the main loop.

4.3.1.4.1 Effects of the Project on Access

During construction and operations, increased traffic will occur between Grande Prairie and the PLPP location. This would be associated with daily morning and evening commutes during construction and during regular shift changes during operations. According to the Alberta Transportation website (<http://www.transportation.alberta.ca/6118.htm>), the Government of Alberta will be investing \$200 million in project along Highway 40, with a total of 180 km of highway improvements. Any future effects resulting from increased transportation requirements on highway 40, resulting from any and all use of the highway, are continually assessed and managed by the Government of Alberta through Highway Traffic counts, which provide important data for highway planning and management⁵. Upgrades or other maintenance requirements to Highway 40 are outside the scope of the PLPP.

For the transportation of heavy equipment or other project infrastructure components that may be required, necessary permits will be obtained prior to transportation. Alberta Transportation establishes maximum vehicle weight and dimension limits to preserve highway infrastructure and to ensure the safety of the travelling public. This includes legal limits for any registered vehicle for travel on any public road, as well as the provision for movement of oversize loads under permit. Alberta Transportation ensures the safety of the traveling public, minimizes the inconvenience to the traveling public, minimizes damage to

⁵ <https://www.alberta.ca/management-of-alberta-highways.aspx>

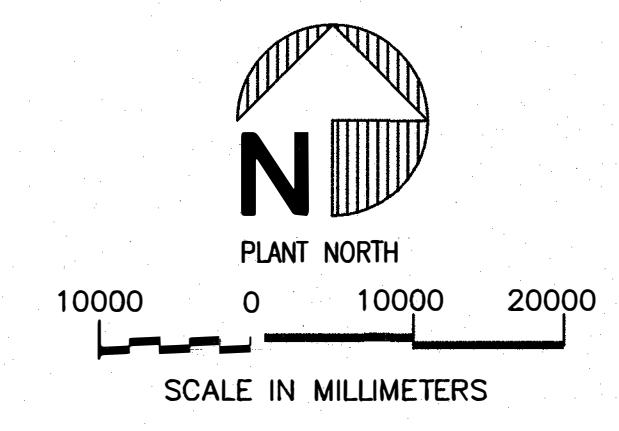
the roadway infrastructure, facilitates the movement of commodities which are non-divisible, deemed impractical to divide, or uneconomical to transport at legal dimensions, and establishes and communicate to the carriers, a set of conditions for the safe movement of the required loads. Therefore, any transportation requirements and effects will be managed by Alberta Transportation.

The PLPP uses existing roads that currently provide public access opportunities to crown lands in the area. No new access roads will be created in the development of the PLPP. Therefore, the effects on the quality and quantity of resources used for traditional purposes (medicinal plants, native and rare vegetation, natural and old growth dependant forests), due to cumulative effects and increased access from non-community members to remote/culturally important areas would not be expected. By using existing access roads, the PLPP would not increase public access to crown land and Indigenous culturally important areas, should such features exist in the surrounding landscapes. Culturally important areas immediately within or surrounding the PLPP have not been identified by Indigenous groups during the engagement process to date.

Figure 8. General Equipment Arrangement

- 1 GAS TURBINE ENCLOSURE
- 2 COMBUSTION TURBINE GENERATOR
- 3 STEAM TURBINE
- 4 STEAM TURBINE GENERATOR
- 5 HRSG
- 6 GLAND STEAM CONDENSER
- 7 CLOSED COOLING WATER PUMPS
- 8 STG SEAL OIL UNIT
- 9 AIR COOLED CONDENSER (ACC)
- 10 ACC CONDENSATE TANK AND DEAERATOR
- 11 STEAM JET AIR EJECTOR (SJAE)
- 12 FIN-FAN COOLER
- 13 GSU TRANSFORMER
- 14 SERVICE/FIREWATER STORAGE TANK
- 15 DEMINERALIZED WATER STORAGE TANK
- 16 DEMINERALIZED WATER PUMPS
- 17 SERVICE WATER PUMPS
- 18 FIRE PUMP ENCLOSURE
- 19 RESIN RECOVERY TANK
- 20 POLISHER AIR RECEIVER
- 21 ROLL-UP DOOR
- 22 PLANT WASTEWATER SUMP
- 23 HRSG BLOWDOWN TANK
- 24 HRSG BLOWDOWN SUMP
- 25 CEMS ENCLOSURE
- 26 STG LUBE OIL SKID
- 27 TURBINE PULL SPACE
- 28 FEEDWATER PUMPS
- 29 AUXILIARY BOILER
- 30 STG ATMOSPHERIC DRAINS TANK
- 31 HRSG ELECTRICAL ENCLOSURE
- 32 VACUUM DRAINS TANK PUMPS
- 33 VACUUM DRAINS TANK
- 34 STG HYDRAULIC SUPPLY UNIT
- 35 AIR COMPRESSOR SKID
- 36 CTG LUBE OIL MODULE
- 37 CTG ELECTRICAL PACKAGE
- 38 GEN VT & SURGE CUBICLE
- 39 MAIN ELECTRICAL ROOM
- 40 ***NOT USED***
- 41 STATION AUX TRANSFORMERS
- 42 SEE/SFC PACKAGE
- 43 SEE XFMR
- 44 SFC XFMR
- 45 SWITCHYARD ELECTRICAL BUILDING
- 46 SWITCHYARD
- 47 ADMIN/WAREHOUSE/CONTROL BUILDING
- 48 SAMPLE PANEL
- 49 CTG CONTROL OIL SKID
- 50 FUEL GAS SCRUBBER
- 51 PIPE RACK
- 52 KETTLE BOILER (IF REQUIRED)
- 53 ELECTRIC SUPERHEATER
- 54 EXCITATION CONTROL COMPARTMENT
- 55 STG ELECTRICAL ROOM
- 56 POTABLE WATER STORAGE TANK
- 57 OIL/WATER SEPARATOR
- 58 BREAKER
- 59 POTABLE WATER PUMP
- 60 WATER WASH DRAINS TANK
- 61 ACC ELECTRICAL-PDC ENCLOSURE
- 62 CONDENSATE PUMPS
- 63 ADVANCED PRECOAT SKID
- 64 FUEL GAS CONDITIONING AREA
- 65 PRECOAT POLISHING SKID
- 66 STAND-BY DIESEL GENERATOR
- 67 SPENT SLURRY SUMP
- 68 RO 1 & 2
- 69 CHEMICAL SKID
- 70 EDI SKID 1 & 2
- 71 CIP SKID
- 72 PLC
- 73 DRAINAGE POND
- 74 WASTEWATER STORAGE TANK
- 75 SEPTIC TANK

GENERAL NOTES:



ORIGINAL

PRELIMINARY
NOT FOR CONSTRUCTION

ISSUED FOR REVIEW

4/5/19	W	HS	DS	VJS	LA
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ISSUED FOR REVIEW

3/26/19	KDE	DEM	SEO	VJS	LA
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ISSUED FOR REVIEW

3/20/19	KDE	DEM	SEO	VJS	LA
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ISSUED FOR REVIEW

1/31/19	KDE	DS	SO	VJS	LA
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REVISION	DATE	BY	CHECKED	APPROVED	PROJ. TECH.	D.R. TECH.	PROJ. MGR.	INS'G

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PRAIRIE LIGHTS POWER PROJECT
GRANDE PRAIRIE, ALBERTA CANADA
GENERAL ARRANGEMENT

DWG. 662981 GA002-S001

TIE-IN POINT	NAME	LOCATION
TP-01	FUEL GAS (NATURAL GAS)	STUB-UP @ SW CORNER OF SITE (SEE GA001)
TP-02	FUEL OIL (DIESEL)	FILL NOZZLE ON STANDBY DIESEL GENERATOR TANK
TP-03	FUEL OIL (DIESEL)	FILL NOZZLE ON FIREWATER DIESEL ENGINE DRIVE DAY TANK
TP-04	POTABLE WATER	INLET NOZZLE ON POTABLE WATER STORAGE TANK
TP-05	RAW WATER	INLET NOZZLE ON RAW/FIRE WATER STORAGE TANK
TP-06	PROCESS WASTEWATER	CONNECTION TO PLANT WASTEWATER TANK OUTLET
TP-07 THRU TP-10	***NOT USED***	
TP-11	OILY WASTEWATER	CONNECTION TO PLANT OILY WASTEWATER SUMP OR TANK OUTLET
TP-12	CHEMICAL	CONNECTION TO CHEMICAL TOTE OUTLET
TP-13	CHEMICAL	CONNECTION TO CHEMICAL TOTE OUTLET
TP-14	CHEMICAL	CONNECTION TO CHEMICAL TOTE OUTLET
TP-15	CHEMICAL	CONNECTION TO CHEMICAL TOTE OUTLET
TP-16 THRU TP-19	***NOT USED***	
TP-20	CONSTRUCTION POWER	
TP-21	ELECTRICAL TRANSMISSION	TERMINATION STRUCTURE FOR INTERCONNECTION OF AESO 144KV LINE #1
TP-22	ELECTRICAL TRANSMISSION	TERMINATION STRUCTURE FOR INTERCONNECTION OF AESO 144KV LINE #2

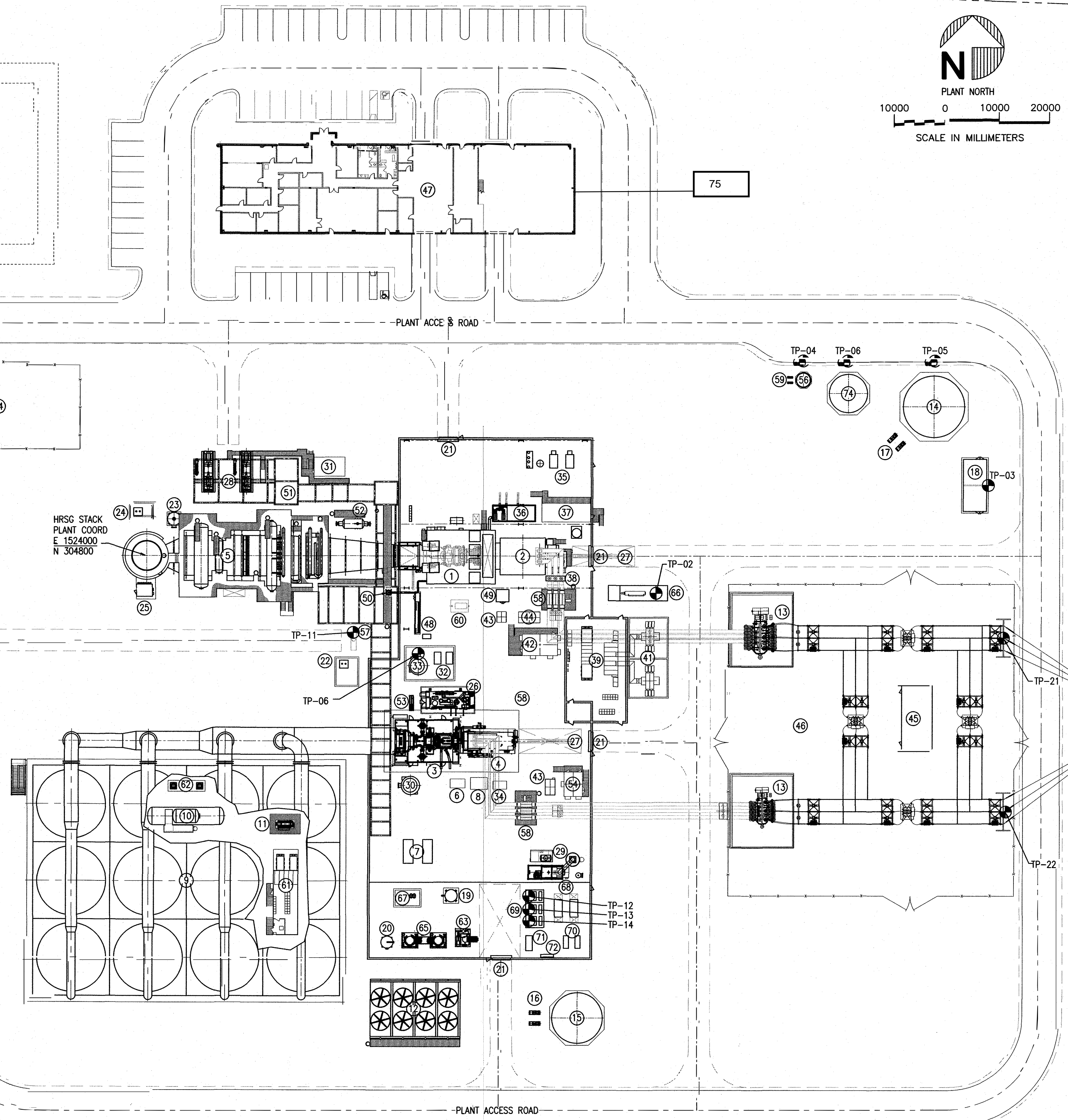
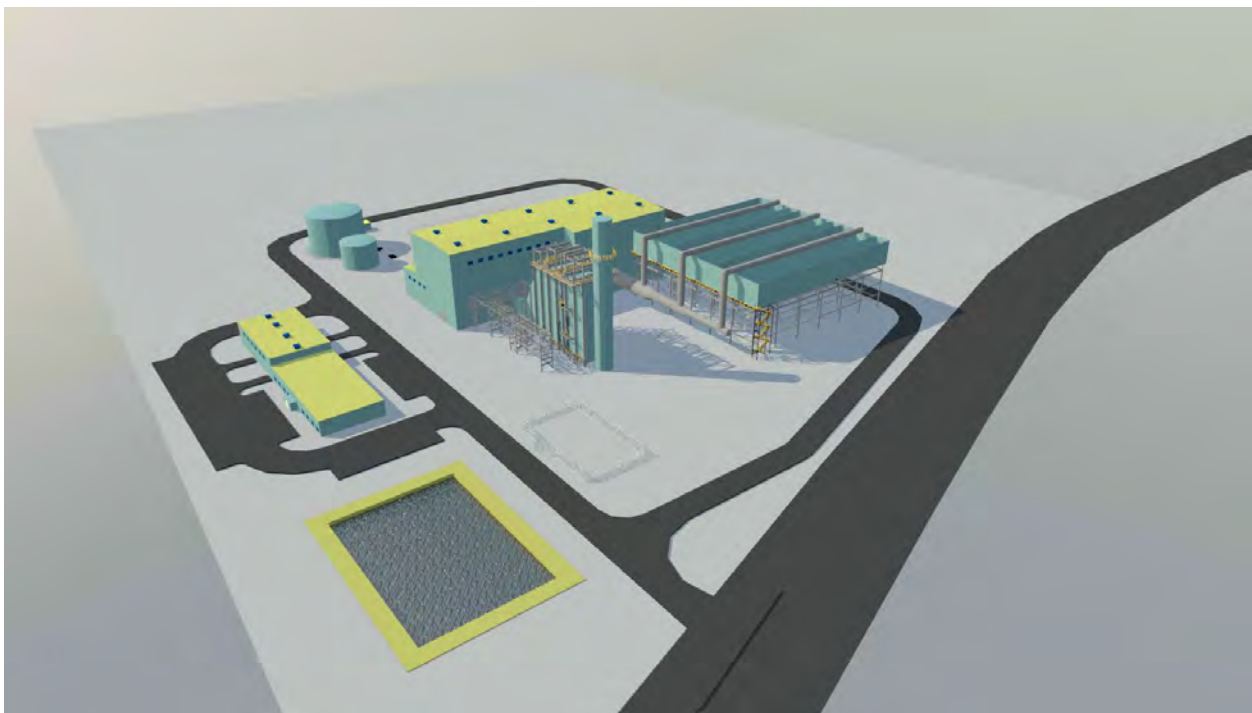
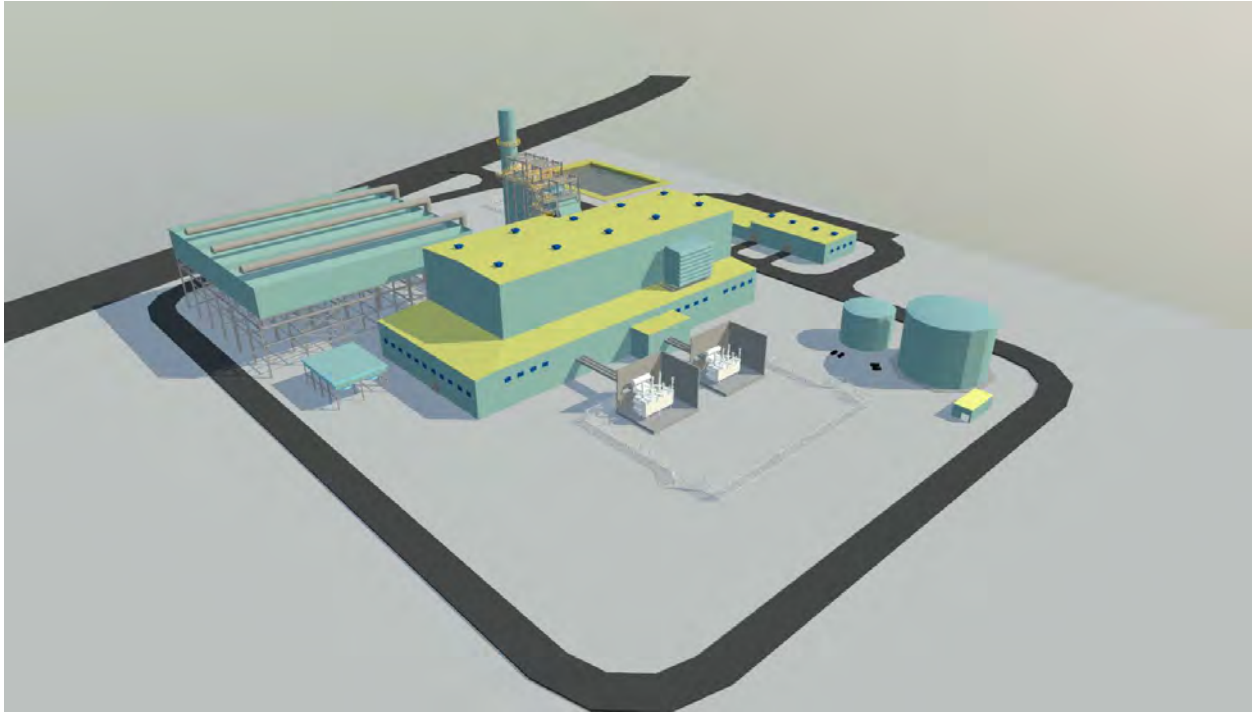


Figure 9. Visual Simulation

PRAIRIE LIGHTS POWER PROJECT

Visual Simulations

Below are simulated examples of what the Prairie Lights Power Project will look like upon completion of construction. The colour scheme is subject to change however the plant site layout is indicative of the proposed plant site.



4.3.1.5 Natural Gas Supply

In order to fuel the PLPP, natural gas will be supplied from a new dedicated pipeline from the ATCO Grande Prairie Mainline, located 2.2 km south of the PLPP. The pipeline will be owned and operated by PLPLP.

4.3.1.6 Existing Infrastructure

There is no existing infrastructure within the Project lands. The only existing infrastructure that is present adjacent to the Project lands and includes:

- an existing all weather high grade gravel road, approximately 7 metres in width that parallels the western boundary of the Project lands;
- an existing high voltage transmission line parallels the eastern boundary of the Project lands;
- an existing CNRL oil and gas surface lease on the SE boundary. However, this oil and gas surface lease has not been drilled to date and no surface disturbance has taken place.
- An existing Shell Canada storage site. To date there is no infrastructure on this location however the surface soils have been removed by construction.\

Please refer to Appendix D - Survey Plan.

4.3.2 POWER PRODUCTION OF THE DESIGNATED PROJECT

The Project Area is located on 20.6 ha of crown land. The Project footprint will be located in the northern portion of the Project Area, includes the equipment layout, which covers approximately 6 ha within the Project footprint.

When fully operational, the Project will be capable of producing a maximum power output of 360 MW, which is above the threshold of 200 MW set out in the *Physical Activities Regulations*: SOR/2019-285, Schedule, 30.

4.3.3 PROJECT EXPANSION

The Project is a new facility and neither a component of, nor expansion of, another project.

4.3.4 DESCRIPTION OF PHYSICAL ACTIVITIES INCIDENTAL TO THE PROJECT

Activities that are incidental to the Project's construction and operation, and outside of PLPLP's control include:

1. Maintenance and upgrading of the existing access road along the west boundary. The access road is owned and operated by Canfor and PLPLP will pay a road usage fee for continued use of the road. Other than this expected payment, there are no contractual relationships between PLPLP and the road owner.
2. General telecommunications in the Project area.
3. Construction and operation of a single double circuit 144kV transmission line that will provide electrical interconnection between the plant and the existing Big Mountain 845S substation. Design and construction of the new transmission line and expansion of the Big Mountain substation to accommodate the new transmission line will be done by ATCO and/or by a separate contractor. This transmission line will be constructed for the sole use by the PLPP. The transmission line is subject to AUC requirements. As the Project will be providing electrical energy to the provincial power grid, PLPLP will be submitting an application to the Alberta Utilities Commission for connection of the Power Project to an electric distribution system pursuant to Section 18 of the HEEA. Submission will be completed as per the requirements in AUC Rule 007- Applications for Power Plants, Substations, Transmission Lines, and Industrial System Designations. The program includes engagement with the public (e.g., local landowners), Indigenous groups, government agencies, municipalities, industry, association and special interest groups. An environmental and feasibility assessment is being completed for three possible route options.

4.3.4.1 Effects to Navigation – Air

Infrastructure lighting will meet the design requirements and quality assurance for lights required under *Canadian Aviation Regulations 2019-1*. PLPLP will complete and submit an Aeronautical Assessment form for obstruction marking and lighting and will notify NAV Canada using the Land Use Submission Form, which includes specific information on infrastructure coordinates and structure heights.

The results of this submission are intended to provide guidance to PLPP and requirements to limit any effects to air navigation through the appropriate use of lighting. Furthermore, the application will provide coordinates of any structures that may pose a hazard to navigation for inclusion on flight maps for aviation.

4.3.4.2 *Effects to Navigation – Water*

No use of, equipment crossings of, or transmission line crossing of the Smoky River are required. Therefore, there are no effects to navigation on the Smoky River.

The pipeline does not cross any watercourses.

The above ground transmission line will cross the Big Mountain Creek at 391429.00 m E; 6086005.00 m N (Zone 11U). No use of water or infrastructure within the water will be required during operation of the transmission line. During construction, no crossings of the Big Mountain Creek are required. Access in and around Big Mountain Creek will occur from existing access on the north and south sides of the Creek at the crossing location. The overhead power line will clear span the Big Mountain Creek with no infrastructure within the creek. Therefore, there will be no affects to navigation on Big Mountain Creek during construction or operations.

4.4 EMISSIONS, DISCHARGE AND WASTE

The PLPP construction and operations will result in air emissions (fugitive during construction; controlled during operations); noise emissions; surface runoff discharges; industrial wastewater disposal, and general operational waste generation.

4.4.1 AIR

4.4.1.1 *Provincial Overview*⁶

Historically, power production in Alberta is dominated by coal. Installed generation capacity in Alberta in 2015 was 16,526 MW with coal-fired generation and natural gas-fired generation contributing 38% and 44%, respectively. In 2015, coal-fired units produced 67% of electricity in Alberta. Due to coal dominance, GHG intensity of power generation in Alberta is the highest among Canadian provinces. In 2015, the intensity was 790 gCO₂/kWh. Alberta has relatively limited electricity interconnections. Current connections are with British Columbia, Saskatchewan and Montana.

⁶ Overview information quoted from (Doluweera, et al., 2018)

The industrial sector consumes more than 55% of the electricity used in Alberta. The average forecasted growth rate for the period 2016-2030 is 0.8% per year. Under Alberta's Climate Leadership Plan, all coal units are expected to retire in, or before, 2030. The same plan requires 30% or more electricity generation in Alberta to be produced by renewable generation technologies. Alberta has had a price on carbon emissions since 2007, making it one of the first North American jurisdictions to enact carbon pricing.

Being the province with the highest CO₂ emissions from electricity generation in Canada, Alberta is actively pursuing options to reduce carbon emissions from the electricity sector. All generation options available for Alberta significantly lower CO₂ emissions intensities compared to grid average levels. The province has a reliable supply of relatively low cost natural gas. A combination of natural gas-fired generation and renewable resources can supply lower GHG emissive electricity at a competitive cost.

In January 2002, Alberta Environment asked the Clean Air Strategic Alliance (CASA) to develop a new way to manage air emissions from electricity generation in Alberta. "Using a multi-stakeholder collaborate approach, CASA developed innovative solutions in the form of 71 recommendations comprising a management framework and presented it to the Government of Alberta. This framework represented a set of consensus recommendations, agreed to as a package with all elements equally important and stakeholders noting that if the framework is fragmented in any way, the overall framework can no longer be regarded as a consensus package with full stakeholder support. The report, *An Emissions Management Framework for the Alberta Electricity Sector* (the Framework), was accepted by the Government of Alberta and implemented through regulations, standards, and facility approvals. The first emission standards were effective January 1, 2006."⁷ To ensure continuous improvement and keep the Framework timely and relevant, a formal review of the Framework occurs every five years. In 2018 the five-year review goal was to ensure the framework reflects the current circumstances of Alberta's electricity sector.

The 2018 review confirmed that Alberta's electricity market is in transition from an energy-only market to capacity and energy markets. The electricity sector is also impacted by federal and provincial environmental policy such as the Alberta Climate Leadership Plan, the National Air Quality Management System including Base-level Industrial Emission Requirements (BLIERS), and the Federal Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations. The Alberta Climate Leadership Plan

⁷ 2018 CASA Electricity Framework Review: Perspectives on a NO_x Emission Standard for Natural Gas-Fired Turbines. 2018.

includes a phase out of coal-fired electricity generation and policy direction to have 30% of electricity in Alberta generated by renewables by 2030.

The coal phase-out is expected to result in an increased number of gas-fired generation units in the province, some of which will be gas turbines. The Canadian Ambient Air Quality Standards (CAAQS)³ for NO₂ will be put into place in 2020 and become more stringent in 2025.

As Alberta moves forward with its commitment to phase out coal emissions, increase the capacity of renewable energy in the province by 2030, and move to a capacity market, many electricity generators have expressed the intent to build new natural gas-fired turbines or coal to gas conversion units. Additionally, Alberta needs to continue to manage emissions in the provincial air zones to ensure that its principles of pollution prevention, continuous improvement, and keeping clean areas clean are being met and that the CAAQS are achieved, and to allow for future growth and development.

4.4.1.2 Operations

PLPLP has completed an Air Quality Assessment (AQA) for the PLPP. The AQA has been prepared to support PLPLP's Industrial Approval Application and is provided in Appendix H.

The contaminants of concern from the emission source are NO_x, composed of nitric oxide (NO) and nitrogen dioxide (NO₂), Carbon Monoxide (CO) and particulate matter less than 2.5 microns in diameter (PM_{2.5}). No methane (CH₄) is produced from the operation of the PLPP. The purpose of the air quality modelling was to evaluate the Project in terms of its compliance with the Alberta Ambient Air Quality Objectives (AAAQO). Emissions of total suspended particulate (TSP) were not considered for the assessment, because all particulate matter emitted from the Project was considered to be PM_{2.5}, which has more stringent objectives than TSP. Project emission sources of CO, NO_x, and PM_{2.5} were identified and characterized. The Project includes one combustion turbine generator with a net power output of 360 MW and a 13 MW auxiliary boiler, however emissions from the auxiliary boiler were determined to be negligible and were therefore not included in the assessment. The results of the Air Quality Assessment (AQA) modeling predict that cumulative maximum CO, NO₂, and PM_{2.5} concentrations resulting from the addition of the PLPP to existing external industrial emission sources and ambient background, were less than their corresponding AAAQOs for all relevant averaging periods.

Table 5. Maximum Predicted Emissions Concentrations (ug/m³)

Pollutant	Averaging Period	Ambient Background	Maximum Predicted Concentration from the PLPP	Maximum Predicted Cumulative Concentration	AAAQO
CO	1 – hour	1308	6.98	1542	15,000
	8 – hour	1308	6.91	1501	6000
NO₂ (total conversion)	1 – hour	54.7	28.6	392	300
	Annual	16.2	1.02	31.5	45
NO₂ (OLM)	1 – hour	54.7	28.6	161	300
	Annual	16.2	1.02	28.7	45
PM_{2.5}	24 hour	17.05	0.62	24.1	29

Air monitoring during operations will occur as per the methodologies outlined in the approval for the Power Project, which is expected to include the requirements of the document entitled *Air Monitoring Directive*, (AMD) which specifies environmental monitoring and reporting requirements and guidelines for Alberta.

The AMD outlines the methods acceptable for air monitoring and reporting, as required by an Alberta EPEA approval, Code of Practice, Registration, or any other air monitoring and reporting activities for which data is submitted. In addition to the AMD, other regulatory tools exist to specify air monitoring requirements, including, but not limited to the Stack Sampling Code, and *Substance Release Regulation*. Mandatory electronic reporting of continuous emission monitoring data began in Alberta with the April 2007 release of the 2006 Amendments to the Air Monitoring Directive, 1989. The 1989 Air Monitoring Directive (AMD) has now been amended and replaced by the 2016 AMD. Reporting of continuous emission monitoring data is required by Chapter 9 of the 2016 AMD.

The purpose of the AMD is to:

- outline the minimum requirements for the collection and reporting of air monitoring data in Alberta;
- establish a set of consistent requirements for quality assurance practices that ensure, and allow for verification of, the quality of the air data collected in Alberta and ensure data comparability among monitoring sites; and
- provide guidance and criteria to operators of monitoring equipment, auditors, and the Regulator on minimum quality assurance requirements and air monitoring and reporting requirements.

The AMD outlines the methods acceptable for air monitoring and reporting, as required by an Alberta EPEA approval, Code of Practice registration, or any other air monitoring and reporting activities for which data is submitted to the Regulator. In addition to the AMD, other regulatory tools exist to specify air monitoring requirements, including, but not limited to, the CEMS Code, Stack Sampling Code, and Substance Release Regulation.

Air monitoring data may be used to:

- assess and report on the state or quality of the environment;
- assess trends or perform analyses
- determine compliance with guidelines and standards;
- input into modeling or forecasting applications; and
- make management and policy decisions.

Hence, the AMD ensures air data submitted is consistent, of high quality, and reliable. In all parts of the AMD, mandatory requirements are enforceable and legally binding.

The plant will be equipped with a continuous emission monitoring system (CEMS) capable of monitoring carbon monoxide (CO), oxides of nitrogen (NO_x), oxygen (O₂), and opacity as per the requirements of the AMD and the CEMS Code (1998). The CEMS Code identifies acceptable methods and specifications for the installation and operation of such monitoring systems. CEMS consist of the following subsystems:

1. Sample Interface/Conditioning;
2. Gas Analyzers;
3. Data Acquisition;
4. Flow monitor (where applicable).

The acceptability of CEMS is performance based; however minimal design specifications are specified. These specifications have been established either to ensure the overall stability of the CEMS once the analyzers are incorporated into the system, or to ensure that accurate readings will be obtained for the parameter being measured.

Additional parameters may need to be monitored based on the PLPP approval conditions. A data acquisition and report generating system (DARS) will also be provided.

PLPLP will become a contributing member to the Peace Airshed Zone Association (PAZA). PAZA is a non-profit organization that operates a network of six continuous monitoring

stations and 49 passive monitoring stations that collectively monitor air quality across the Peace region to provide scientifically credible air quality data on a regional scale.⁸

4.4.1.2.1 Operational Fugitive Emissions

The key elements for effective long-term control of fugitive emissions are the application of best available technology and standards, implementation of management systems, and corporate commitment⁹. The application of control technologies and design standards, alone, do not preclude the potential for fugitive emissions. Reliable fugitive emissions control requires the development of monitoring programs, operating procedures and performance objectives for controlling fugitive emissions, and management's commitment to the implementation and maintenance of an Inspection and Maintenance program.

As a component of successful and profitable operation of the PLPP, necessary components are subjected to regular screening for leaks as part of regular and scheduled maintenance. The objective is to minimize the potential for leaks in the most practicable manner possible. This is done by focusing efforts on the types of components and service applications and maintenance requirements most likely to offer significant cost-effective control opportunities.

Once a leak is detected and is determined to need fixing, this will be done within a reasonable period of time or at the next facility turnaround if a major shutdown is required

4.4.1.3 Construction and Reclamation

Construction and reclamation operations activities can affect air quality by producing dust and emissions (i.e., tailpipe exhaust emitting CO₂ and nitrous and sulphur oxides) mainly due to heavy machinery use and transportation. Emissions will be limited to tailpipe emissions from vehicle use during construction and reclamation, dust associated with construction and reclamation equipment, and the fugitive emissions from equipment leaks that are unintentional losses and may arise due to normal wear and tear, improper or incomplete assembly of components, inadequate material specification, manufacturing defects, damage during installation or use, corrosion, fouling and environmental effects. This may also result in odour release.

The main contributors to criteria Air Contaminant Emissions (ACE) of the Project will be heavy machinery and truck transportation during the construction and reclamation phases.

⁸ Peace Airshed Zone Association. <https://www.paza.ca/#owlcarousel-8734-3>

⁹ Canadian Association of Petroleum Producers. 2007. Best Management Practice. Management of Fugitive Emissions at Upstream Oil and Gas Facilities.

Machinery and vehicles will run for the most part on diesel fuel. Emissions generated during these phases are considered to be similar to those produced for similar small-scale construction projects.

Activities were grouped into sequential phases:

1. Grubbing / Land Clearing
2. Grading / Excavation
3. Drainage / Utilities / Sub-Grade / Equipment Erection
4. Reclamation

Using estimated equipment lists, numbers of workers, area of activity and duration of activities, and the built-in assumptions of the Road Construction Emissions Model, versions 7.1.1¹⁰ assumptions, were inputted into the model for analysis. Table 6 summarizes the expected construction-related emissions, with maximum daily estimates based on all equipment in use for the full workday.

Table 6. Emissions Estimates

Project Phases (Metric Units)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	CO2 (kg/day)
	ROG (kg/day)	CO (kg/day)	NOx (kg/day)	PM10 (kg/day)	PM10 (kg/day)	PM10 (kg/day)	PM2.5 (kg/day)	PM2.5 (kg/day)	PM2.5 (kg/day)	
Grubbing/Land Clearing	0.1	0.7	1.4	363.7	0.1	363.6	75.7	0.0	75.6	469.0
Grading/Excavation	0.1	1.0	1.8	181.9	0.1	181.8	37.9	0.1	37.8	526.3
Drainage/Utilities/Su b-Grade	0.3	2.2	3.0	68.3	0.1	68.2	14.3	0.1	14.2	771.5
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	0.3	2.2	3.0	363.7	0.1	363.6	75.7	0.1	75.6	771.5
Total (project)	0.0	0.3	0.4	58.9	0.0	58.9	12.3	0.0	12.2	106.5
Notes:										
Project Start Year ->	2020									
Project Length (months) ->	24									
Total Project Area (hectares) ->	20									
Maximum Area Disturbed/Day (hectares) ->	16									

¹⁰ Sacramento Metropolitan Air Quality Management District, California DOT, California Air Resources Board, U.S. EPA, ICF Jones & Stokes, Tlax LLC. 2012. Road Construction Emissions Model, Version 7.1.1.

Total Soil Imported/Exported (meters³/day)->	0									
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.										
Total PM10 emissions shown in column Total are the sum of exhaust and fugitive dust emissions shown in columns Exhaust (PM10) and Fugitive Dust (PM10). Total PM2.5 emissions shown in Column Total are the sum of exhaust and fugitive dust emissions shown in columns Exhaust (PM2.5) and Fugitive Dust (PM2.5).										

Estimated particulate matter (PM₁₀ and PM_{2.5}) presented include fugitive dust from earth disturbance. However, this represents an unmitigated scenario, and mitigation will be put in place to reduce fugitive dust, including spraying of several roads adjacent to the Project Area with water or other controls as required.

4.4.1.4 Greenhouse Gas Emissions

Greenhouse Gas (GHG) emissions will result from the PLPP. Using emission factors, the expected carbon dioxide (CO₂) emissions have been estimated. In addition, emissions from other GHG contributors, namely methane (CH₄) and nitrogen dioxide (N₂O) were also estimated to determine expected total carbon dioxide equivalent (CO₂e) emissions.

Emissions were estimated using the expected fuel consumption assuming the project runs at maximum capacity (100% load) continuously throughout the year and sector-based emission factors for electric utilities as outlined in Environment and Climate Change Canada's 2018 *Canada's Greenhouse Gas Quantification Requirements*, and 2019 *National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada*. Total GHG emissions, expressed as CO₂e, were estimated using Global Warming Potential (GWP) factors as outlined by Environment and Climate Change Canada. A summary of the estimated annual emissions is provided in the following table.

Table 7. GHG Emission Estimates

Parameter	Total Estimated CO ₂ e Emissions (tonnes/year)
Carbon Dioxide Emissions	1,090,000
GHG Emissions	1,104,000

Although natural gas is a fossil fuel, the GHG emissions from gas combustion are much lower than those from coal. Natural gas emits approximately 50% less CO₂ when combusted in a new, efficient natural gas power plant compared with emissions from a typical new coal plant.¹¹¹²

¹¹ National Energy Technology Laboratory (NETL). 2010. Cost and performance baseline for fossil energy plants, Volume 1: Bituminous coal and natural gas to electricity. Revision 2. November. DOE/NETL-2010/1397. United States Department of Energy.

¹² National Energy Board. 2017. Market Snapshot: Canada's Power Generation: Switching from coal to natural gas. <https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpst/2017/04-02cndpwrgrtn-eng.html>.

GHG emissions in Alberta are currently regulated under the *Climate Change and Emissions Management Act* and the Carbon Competitiveness Incentive Regulation (CCIR). The CCIR applies to facilities that emit greater than 100,000 tonnes per year of GHGs and requires annual compliance and forecasting reporting. It is anticipated that these requirements will be replaced by the Technology Innovation and Emissions Reduction (TIER) early in 2020. Once operational, the PLPP will be subject to the requirements of either the CCIR or TIER programs which include requirements for payment of a carbon tax, completion of verification assessments and GHG emission forecasting.

Under both regulations, electricity generators are required to comply with a “good-as-best-gas” benchmark of 0.37 tonnes CO₂e per megawatt-hour of power produced. Based on these regulations, allowable CO₂e emissions for the facility are 972,360 tonnes per year, slightly under the estimated emissions of 1,090,000 tonnes per year (based on anticipated fuel use). Emissions estimates however were calculated based on conservative estimates of facility operation parameters (e.g. facility operates at peak load 24 hr/day, 365 days/year, no maintenance shutdown periods or other non-operating plant scenarios). As a result, the predicted GHG emissions are likely higher than actual.

In 2016, Alberta’s GHG Emissions were 262.9 megatonnes of CO₂e (National Energy Board, 2019). Under full operation, 365 days / year, the GHG emissions from the PLPP would account for an increase in 1.1 megatonnes, or 0.42% of the Alberta 2016 total GHGs.

The Project provides Alberta with a viable option to assist the transition from coal power plants.

The PLPP will emit 398 tonnes CO₂e/GWH = 398 grams / kWh. The Canada Greenhouse Gas National Inventory Report (2017)¹³, indicates that Alberta had an average GHG Intensity of Generation (g CO₂/kWh) of 790. Although small to the overall provincial GHG contribution from power production, the PLPP would contribute to a decrease in the GHG intensity average if power production by coal sources is reduced.

4.4.1.4.1 GHG Emissions and Federal Regulations

The PLPP completed an assessment that compares the predicted NO₂ concentration results with the Canadian Ambient Air Quality Standards (CAAQS) and provides the information about the

¹³ <https://www.cer-rec.gc.ca/nrg/sttstc/lctrct/rprt/2017cndrnwblpwr/ghgmssn-eng.html?=&wbdisable=true>

Carbon Dioxide Emission Intensity for the PLPP. The assessment is provided in Appendix H - Air Quality Assessment, but summarized below.

4.4.1.4.1.1 Comparing NO₂ results with CAAQS Objectives

1-hour and annual NO₂ concentrations from the project only are below the CAAQS values for 2020 and 2025.

On the other hand, the cumulative 1-hour NO₂ concentration exceeds the 2020 and 2025 CAAQS targets. The cumulative annual concentration is less than CAAQS target value for year 2020. However, the predicted cumulative annual concentration exceeds the 2025 CAAQS target.

As per Table 8 below the project does not contribute much to the cumulative concentration. Contribution of the project into the cumulative 1-hour results is less than 0.8%. Similarly, contribution of the project into the cumulative annual results is less than 0.7%.

Table 8. Comparison of NO₂ results with CAAQS objectives

NO ₂	CAAQS			Maximum Predicted Concentrations (µg/m ³)		
	2020	2025	Basis	Project only	Cumulative ^[1]	Project Contribution into the Maximum Cumulative Concentration
1 hour	112.8	78.96	3-year average of the annual 98 th percentile of NO ₂ daily-max 1-hour average concentration	21.7	151.7	1.2
Annual	31.96	22.56	The average over a single calendar year of all 1-hour average NO ₂ conc	1.02	28.7	0.2

Note: [1] The cumulative concentration includes the contribution from the project, external sources and ambient background.

4.4.1.4.1.2 Carbon Dioxide Emissions Intensity

Carbon dioxide emissions intensity was calculated in accordance with the Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity (Canadian Environmental Protection Act, 1999).

Production of energy was calculated and consists of the gross quantity of electricity generated by the gas and steam turbines (360 MW = 0.360 GW). The summary of the results is provided in Table 9, below.

The calculated emission intensity of 398 tonnes/GWh is below the established limit of 420 tonnes of CO₂ emissions/GWh of energy produced for the units of more than 150 MW.

Table 9. Carbon Dioxide Emissions Intensity

Natural Gas Flow Rate (kg/hr)	Total Carbon content (%)	CO ₂ (tonnes/hour)	Gross Power output (GW)	Emissions intensity (tonnes/GWh)	Limit (tonnes/GWh)
48,581	73.4	143.2	0.360	398	420

4.4.1.4.2 *Climate Change*

As per Table 7 (above) the PLPP exceeds the threshold of 500 kt CO₂e of net GHG emissions per year with total estimated GHG emissions of 1,104 kt CO₂e. Based upon that threshold, (and as per the Government of Canada’s *Draft Strategic Assessment of Climate Change (DSACC)* requirements), PLPLP commits to:

1. Completing a analysis for further understanding how the PLPP will contribute to Canada’s efforts to reduce GHG emissions as per the draft methodology for estimating upstream GHG emissions in Canada Gazette, Part I.¹⁴
2. Assessing the PLPP upstream GHG emissions as per Section 3.2 of the DSACC, which includes:
 - a. a quantitative estimate of upstream GHG emissions associated with the project based on the project’s maximum throughput. This requires information on the methodology, data, assumptions, and approach to estimating those upstream GHG emissions.
 - b. a qualitative discussion about the incrementality of the upstream GHG emissions estimated in Part A. It provides the conditions under which the upstream emissions estimated in Part A could be expected to occur regardless of whether the project proceeds.

¹⁴ Available at www.gazette.gc.ca/rp-pr/p1/2016/2016-03-19/html/notice-avis-eng.html

•
PLPLP will provide this information, in addition the various listed requirement in the DSAAC to Environment and Climate Change Canada (ECCC) upon completion of any analysis. The expectation for completion of this analysis will be June 30, 2020.

4.4.1.5 Monitoring and Mitigation of Effects

4.4.1.5.1 Construction

Construction emissions will be temporary during the construction timeline and will be intermittent during that period as construction would only typically occur during daylight hours.

During construction the number and types of vehicles used will be compared against the initial estimates for construction and reclamation carbon emission estimates provided in Table 5 (above) to determine if estimates were in line with actual construction related emissions. However, prior to that, and as a requirement of the construction contract, all construction related equipment will be required to be maintained and operated according the manufacturer specifications. In addition, a no idling policy will be maintained during construction.

To reduce further effects from transportation of personnel from Grande Prairie for the construction phase of the PLPP, PLPLP will evaluate the opportunities that may exist for bus transportation of persons to and from the worksite. One way is to ensure this is to impose the condition that the proposed EPC contractor create transportation options in a manner that supports a reduction in emissions associated with movement of personnel to and from the worksite.

4.4.1.5.2 Operations

The power plant will incorporate technology that allows operators to continuously monitor turbine exhaust temperature and the back pressure. The plant will be equipped with a continuous emission monitoring system (CEMS) capable of monitoring carbon monoxide (CO), oxides of nitrogen (NO_x), oxygen (O₂), and opacity. Additional parameters may need to be monitored based on the EPEA Permit. Typically, CEMS monitoring occurs on a minute by minute basis so that exceedances can be immediately identified. CEMS results are provided to AEP as a component of the Industrial Approval requirements on a monthly basis.

A data acquisition and report generating system (DARS) will also be provided. An enclosure will be provided near the stack base to house the sample conditioning equipment and the CEMS PLC. Typically this system is interfaced with the Plant DCS for monitoring.

Any change to regular operating conditions would require turbine power scale down to rectify any issues. Therefore, turbine emissions would be minimized in those scenarios.

PLPPL will become a contributing member to the Peace Airshed Zone Association (PAZA). PAZA operates a network of six continuous monitoring stations and 49 passive monitoring stations that collectively monitor air quality across the Peace region.

To reduce further effects from transportation of personnel from Grande Prairie for the shift work operations phase of the PLPP, PLPLP will evaluate the opportunities that may exist for bus transportation of persons to and from the worksite for any required shift work.

PLPP will utilize large frame high efficiency class gas turbine technology designed to meet the requirements with the Alberta Air Emission Standards for Electricity Generation (AEP 2005). The natural gas fired combustion turbine will primarily incorporate low emission combustors for emission control, such as the Dry Low NO_x (DLN) combustion systems, to limit the formation of pollutants in the burning zone by utilizing “lean-premixed” combustion technology.

Utilizing multi-staged lean pre-mixed combustors, the combustion process optimizes the firing rates, firing temperature and controls the heat released to optimum performance and emissions during turbine load transitions, reducing peak temperatures of local hot spots that contribute to NO_x production, thus reducing emissions throughout the operating range of the plant.

Other mitigating measures include selection of an adequate stack height and a low NO_x type natural gas fired burner management system and combustion control for the auxiliary boiler operated during plant start-up.

As previously stated, emissions in Alberta are currently regulated under the *Climate Change and Emissions Management Act* and the *Carbon Competitiveness Incentive Regulation (CCIR)*. The CCIR applies to facilities that emit greater than 100,000 tonnes per year of GHGs and requires annual compliance and forecasting reporting. It is anticipated that these requirements will be replaced by the Technology Innovation and Emissions Reduction (TIER) early in 2020. Once operational, the PLPP will be subject to the requirements of either the CCIR or TIER programs which include requirements for payment of a carbon tax, completion of verification assessments and GHG emission forecasting.

Under both regulations, electricity generators are required to comply with a “good-as-best-gas” benchmark of 0.37 tonnes CO₂e per megawatt-hour of power produced. Based on these regulations, allowable CO₂e emissions for the facility are 972,360 tonnes per year, slightly under the estimated emissions of 1,090,000 tonnes per year (based on anticipated fuel use). Emissions estimates however were calculated based on conservative estimates of facility operation parameters (e.g. facility operates at peak load 24 hr/day, 365 days/year, no maintenance shutdown periods or other non-operating plant scenarios). As a result, the predicted GHG emissions are likely higher than actual.

4.4.1.5.3 Best Available Technology

In Alberta, the NO_x emission performance limit is set based on the more stringent of:

- Ambient environmental quality (the air dispersion model submitted completed indicates that the NO_x maximum ground level concentration will be less than Alberta’s Ambient Air Quality Objectives);

or

- The technology based limit. The *Alberta Industrial Release Limits Policy* provides detail on how to determine the technology based limit but fundamentally the policy requires best available technology.

Even though the *Alberta Industrial Release Limits Policy* is older than the *Alberta Air Emission Standard for Electricity Generation*, the *Alberta Industrial Release Limits Policy* requires industry to use the best available technology. For new generating units for natural gas-fired power plants with an electrical generating power capacity more than 60 MW, Alberta Air Emission Standards for Electricity Generation (AEP 2005) identifies the limit for NO_x emission intensity as 0.3 kg/MWh_{output}. However, in a conference call with AEP in February 2020 regarding the Industrial Approval application, AEP indicated that the PLPP is now required to meet 0.1 kg/MWh NO_x emissions for operations as per the *Alberta Industrial Release Limits Policy*.

- This will be achieved through upgrades to the technologies and will likely include the addition of Selective Catalytic Reduction (SCR) technology.¹⁵ Other technological upgrades are currently being investigated to ensure the PLPP meets the 0.1 kg/MWh NOx emissions.
- The proposed gas turbine utilizes dry low NOx (DLN) combustors to limit NOx emissions intensities. This selected pollution prevention/control technology for the proposed gas turbine exceeds this standard. DLN is the most appropriate NOx emissions control technology for the PLPP. DLN is the sector-specific technology for power generation in Alberta. DLN technology is reliable, well developed, and proven to deliver very low NOx emissions rates. This technology has become the standard for large frame gas turbines of this class and there is extensive experience with DLN control system technology at other facilities within the province and throughout the world. DLN combustion achieves the following objectives:
 - The point source emissions limits are met;
 - The environment and human health are protected by maintaining Ambient air quality within limits;
 - The NOx emission levels are in the upper percentile (lower emissions rate) of the installed, fossil-fueled, electric generation fleet of Alberta;
 - The proposed plant represents an improvement over the average of the installed thermal generation fleet;
 - Source emissions monitoring is incorporated; and,
 - Uniformity of emissions control technology is achieved.
- Plume dispersion analysis has been utilized and will be re-analyzed to assess the effects to ambient air quality due to the addition of the proposed PLPP once technological upgrades are implemented. The plume dispersion modeling includes the NOx emissions of the proposed plant, the contribution from the existing plants in the area, the existing ambient

¹⁵ Selective Catalytic Reduction (SCR) is an advanced active emissions control technology system that injects a liquid-reductant agent through a special catalyst into the exhaust stream. The catalyst sets off a chemical reaction that converts nitrogen oxides into nitrogen, water and carbon dioxide (CO₂). SCR technology is designed to permit nitrogen oxide (NOx) reduction reactions to take place in an oxidizing atmosphere. It is called "selective" because it reduces levels of NOx using ammonia as a reductant within a catalyst system. SCR technology alone can achieve NOx reductions up to 90 percent.

air quality, wind direction, topography, etc... The current plume dispersion modeling demonstrates that, with the addition of the Prairie Lights DLN engine, ambient air quality guidelines are achieved. This would be expected to continue following further technological upgrading.

The following gas turbine manufacturer emission specifications and NO_x emission performance guarantees are provided as follows:

Table 10. Emission Specifications and Guarantees

Reference Conditions	
Fuel Type	Gas
Ambient Temperature Range (°C)	-45 to 40.6
Gas Turbine Load, %	85 MW to 100%
Guaranteed Data	
NO _x , kg/MW-h – NET	0.1
NO _x , ppmvd @ 15% O ₂	23
NO _x , kg/hr	100
CO, ppmvd@ 15% O ₂	20
CO, kg/hr	50
VOC, ppmvd @ 15% O ₂	5
UHC (non-methane), ppmvd @ 15% O ₂	5
Particulate Matter, kg/hr	5

The most effective demonstrated pollution prevention/control technologies for NO_x emissions from the auxiliary boiler is subsequently provided as follows:

- The PLPP includes a natural-gas-fired auxiliary boiler. The boiler will be operated intermittently to warm power generation equipment prior to plant start-ups. The boiler will be equipped with a low-NO_x combustor to limit NO_x emissions intensities.
- For new Boilers using natural gas fuel, with heat input of greater than 10.5 GJ/hr HHV, the Emissions Guideline is given in Alberta Environment, Emission Guidelines for Oxides of Nitrogen (NO_x) for new Boilers, Heaters and Turbines Using Gaseous Fuels Based on a Review of Best Available Technology Economically Achievable (BATEA) December 14, 2007. The Compliance Limit is 26 g/GJ and the Performance Target is 7.9 g NO_x as NO₂/GJ HHV of fuel input.

- While the specific boiler to be purchased has not been identified at this time, the market will offer products that will meet, or improve upon, the Compliance limit.
- Low-NO_x burners are the sector-specific technology for small industrial boilers installed for intermittent operation in Alberta. The boiler combustion system will be tuned to achieve Alberta's NO_x Compliance Limit or better. The combustion controls will maintain proper combustion when the boiler is operated through its load range.
- While analysis of a complete catalog of the industrial boilers installed in Alberta would be difficult, it is fair to say that a new boiler installation, with current low-NO_x combustion technology, would represent an improvement over the average of Alberta's auxiliary boiler fleet.
- Low NO_x burners are the most appropriate NO_x emissions control technology for the auxiliary boiler to be installed as part of the proposed Prairie Lights Power Project.
- An emission specification and NO_x emission performance guarantee will be negotiated during preliminary / detailed engineering phase of the project. Currently the project is in FEED phase and procurement of equipment has not been released.
- The auxiliary boiler will be equipped with stack sampling ports and access platforms compliant with the Alberta Stack Sampling Code.

4.4.1.5.4 Dust Control

During construction, operations and reclamation activities, appropriate dust suppression measures will be used as required. Water will be used for dust suppression on soil piles, exposed soil surfaces or other areas prone to wind and water erosion. Although there is no environmental impact in using water as a dust suppressant, research shows water will only control dust for up to 12 hours due to its evaporation rate. Therefore, in the event of prolonged use of an area, other surface amendments may be used for longer term dust control.

PLPLP will implement appropriate dust suppression measures on roads, work areas, or transportation and loading routes as on PLPP roads. The decision to control dust will be made at the field level and will depend upon site conditions, level of activity, and worker health and safety.

4.4.1.5.5 Health Effects

The PLPP is committed to using the best available technology and appropriate mitigation for construction and reclamation activities at the site. Regarding health and socio-economics, no ingestion or inhalation pathways that could trigger the need for a human health risk assessment are anticipated. The emissions from the PLPP during operations will be compliant with provincial and federal requirements. The existing oil and gas activity and forestry harvesting in the immediate area likely preclude indigenous use of the PLPP and immediately adjacent and surrounding areas. These factors alone would be expected to limit potential effects to human health to such a degree that effects would be deemed insignificant. Protection of worker health and safety will be in accordance with provincial and federal requirements.

In the case of the public, two weeks prior to the initiation of construction, PLPP will post a notice in the local newspaper in Grande Prairie, update all persons / companies previously consulted with as a function of the AUC application requirements, and notify all Indigenous Peoples that construction will be commencing. In addition, signage will be posted at public access points on the adjacent roads and intersections that construction will be commencing, including the expected duration of construction and reclamation.

During operations, signage will be posted at the entrance to the facility which will provide contact information for the public to engage PLPLP with questions or concerns. Indigenous Groups will be continually updated as per the commitments provided in Section 8 of this document.

Finally, the Emergency Response Plan will include notification requirements to ensure that in the event of an accident or malfunction, the effects of accidental discharges or releases is minimized on the public.

4.4.2 NOISE

PLPLP has completed a Noise Impact Assessment (“NIA”) for the Power Project. The NIA has been prepared to support PLPLP's Industrial Approval Application and meets the requirements of the Alberta Utilities Commission (AUC) issued Rule 012 - Noise Control. The purpose of the NIA is to ensure that the noise from a PLPP, measured cumulatively with noise from other energy-related facilities, does not exceed the permissible sound level allowed at a receptor.

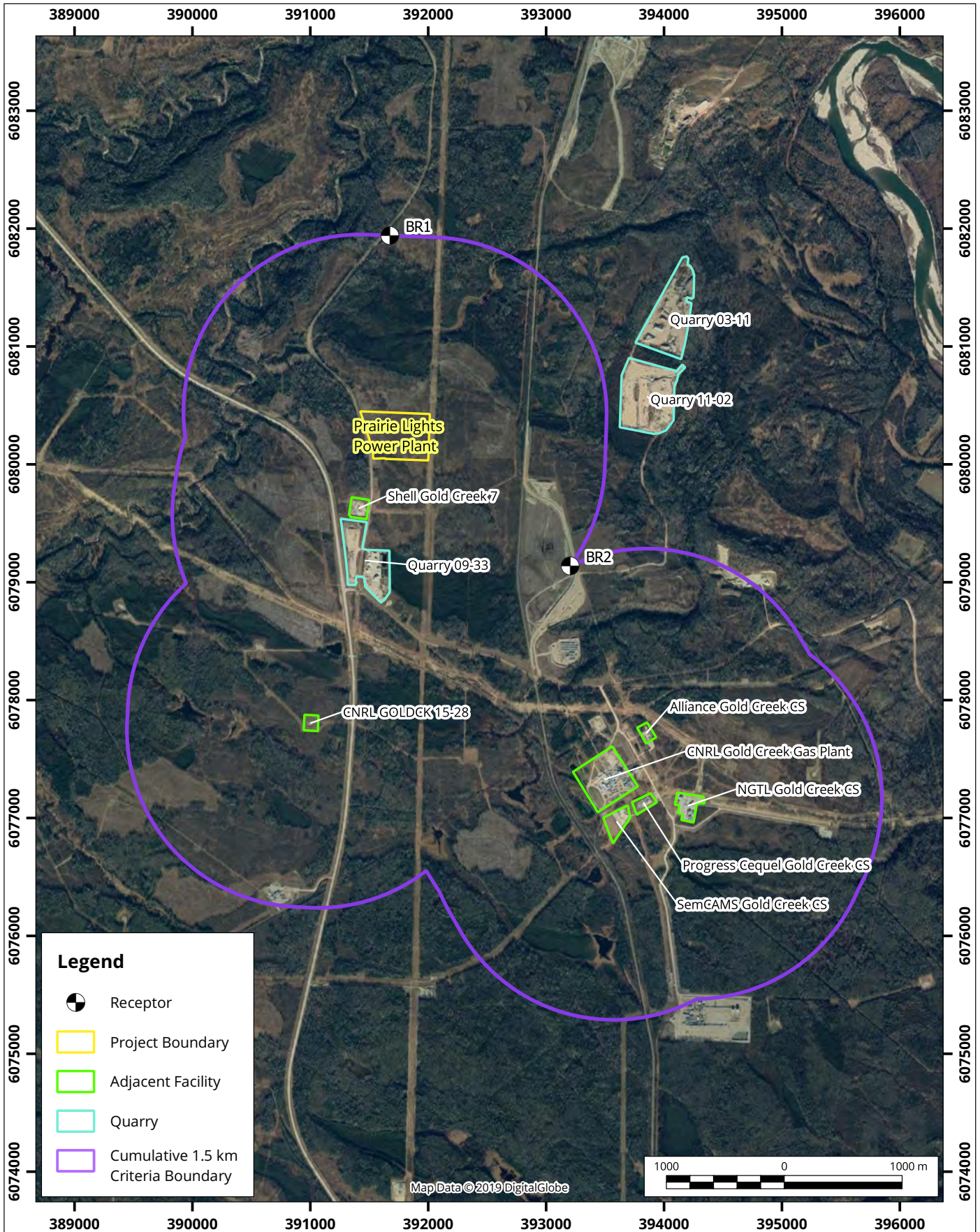
Located to the south and southeast of the project are existing oil and gas facilities, which include well pads, compressor stations, and gas plants. These facilities were included in the cumulative assessment.

A 1.5 km boundary was created for each of the adjacent facilities identified in Figure 1 and the Project fence line. The overlapping boundaries were merged to create a continuous cumulative 1.5 km criteria boundary. There is a work camp located approximately 1.9 km southeast of the Project. The Work camp is operated by the CNRL gas plant and is found within the 1.5 km boundary from that facility. Any noise contributions at this location would be primarily attributed to the CNRL gas plant. As it is within the CRNL gas plant project boundary according to AUC Rule 012, it is not considered a noise-sensitive receptor in this report. No other dwelling receptors were identified in the 1.5 km criteria boundary. Therefore, noise impact was assessed along the cumulative 1.5 km boundary. Table 11 (Figure 10) shows the location of the most impacted receptor points along the 1.5 km criteria boundary. BR1 is the location with the maximum Project contribution. BR2 is the location with the maximum cumulative sound level.

Table 11. Location of Receptors

Receptor ID	Distance from Project	Direction from Project
BR1	1500 metres	N
BR2	1500 metres	SE

Figure 10. Detailed Project Location and Cumulative Noise boundary at 1.5 km



Prairie Lights Power Project
Detailed Project Location and Cumulative 1.5 km Criteria Boundary



Drawn by: RNL	Figure: 1
Approx. Scale: 1:45000	
Date Revised: Jul 03, 2019	



This noise impact assessment has found that the Prairie Lights Power Project complies with the AUC Rule 012 daytime and nighttime PSL of 50 and 40 dBA based on the specifications provided. Since no receptors were found within 1.5 km of the criteria boundary, compliance was assessed at the 1.5 km criteria boundary. The potential for low frequency noise complaints is low because the Project is in a remote location with no dwellings nearby. A copy of the Noise Impact Assessment is found in Appendix O - Noise Impact Assessment.

4.4.2.1 Noise Related Effects & Mitigation

During construction and operations, the PLPP will comply with the Alberta Occupational Health and Safety (OHS) Code Part 16 – Noise. In Canada, each province sets its own standards for noise. For example, in Ontario, workplace noise regulations (O. Reg. 381/15) fall under the Provincial Occupational Health and Safety Act (OHSA). In Alberta, workplace noise exposure limits are set by Part 16 of the Alberta Occupational Health and Safety Code. Canada was one of the first countries to issue an occupational noise measurement standard (in 1986), whereby workplace noise exposures found in industrial settings must be measured in accordance with CAN/CSA Standard Z107.56-06, Procedures for the Measurement of Occupational Noise Exposure.

The NIA has determined that in both nighttime and daytime conditions, cumulative sound levels at receptors will not exceed current regulatory requirements. In addition, there are no permanent receptors (i.e. permanent residences) that will be affected by construction activity, machinery use and increased vehicle traffic. Although the potential effects of noise on human health were listed in the summary of issues, PLPP contends that the AUC has determined in its decision that the PLPP NIA and additional noise-related information request responses demonstrate that cumulative sound levels for the project are predicted to be below the daytime and nighttime permissible sound levels set out in Rule 012 and that the project is unlikely to result in low frequency noise issues. Finally, due to a lack of permanent receptors and there will be no health related effects to nearby people as construction and operational related noise will comply with applicable regulations.

4.4.3 WATER USAGE AND CONTROLS

The following are the daily water volume estimates for the PLPP:

- Raw Water: 77,350 liters/day normal operations up to 189,360 liters/day maximum
- Wastewater: 52,300 liters/day
- Sanitary Sewage: 21,600 liters/day

- Domestic Potable Water: 21,600 liters/day

4.4.3.1 Surface Runoff

The purpose of the storm water pond is hold runoff from major event and allow any solids to settle before releasing it. The Project is not allowed to use water collected in the storm water ponds for operation purposes or disposal in deep-well injection unless that removal is licenced under the Alberta *Water Act*. Storm water will be tested and meet the following criteria prior to being released in a controlled fashion to adjacent lands:

- chloride content 500 mg/L maximum (e.g., test strips),
- pH 6.0 to 9.0 (e.g., test strips and/or meter readings),
- no visible hydrocarbon sheen (roughly equates to less than 10 mg/L),
- no other chemical contamination (e.g., clean operating conditions such that collected waters are not impacted by spills/releases),
- water not allowed to flow directly into any watercourse, and
- each release recorded, including the prerelease test data and the estimated volume of water released.

Any water that is not suitable for release will trucked out to a 3rd party certified wastewater disposal/treatment facility.

4.4.3.2 Storm Water Management

All surface water industrial runoff is being managed as a function of the PLPP. The collection of surface runoff from the PLPP is done for the purposes of keeping the operational area as dry as possible.

- Surface runoff from the operational area will be collected by ditches, swales and grading directed to a storm water pond located at the northwest corner of the operational area. Dikes and berms will be installed along the plant perimeter as required to keep runoff within the operational area.

As the pond will only capture surface runoff, no hazardous materials will affect the quality of the water. PLPLP has a spill response plan and any spills or leaks will be immediately handled to ensure no effects to surface water or runoff.

Surface runoff will be managed as per the requirements of the Alberta Industrial Approval. No wastewater, sludge or surface runoff will be released directly to watercourses as a result of operations.

Any pump off water from the pond will likely be directed towards the north side of the PLPP into surrounding natural vegetation and will drain north through natural topography. All water will be discharged without causing erosion (erosion control will be provided at the discharge point). The water will be discharged to a well vegetated area where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release.

At this time, the pond design characteristics, including liner types, leak detection, or other requirements, have not been finalized but will be done during final plant design once an EPC contractor has been determined.

Storm water pond overall size to accommodate a storage capacity for up to the 1 in 100 year storm with a detention time of 24 hours. Crest dimensions will be approximately 76m x 47m. The pond depth will be approximately 1.85 m including 0.6m freeboard. The pond would have a capacity of 4,470 cubic meters.

4.4.3.3 Industrial Wastewater

The PLPP potential raw water volume use, and subsequent wastewater volumes was reduced by deciding to use an air cooling system instead of a water cooling system. This eliminated the need for raw water ponds and significantly reduced the required water volumes for operations. This use of an air cooled system increased the overall PLPP costs by approximately \$10,000,000 but PLPP deemed the reduction in water use as a fundamental operating commitment.

The PLPP will generate approximately 52,300 litres/day. No industrial wastewater will be released to the environment.

As per the Water Balance Process all industrial wastewater and process liquids will be collected and temporarily stored in tanks, then pumped to a truck for disposal at an approved wastewater collection facility.

All tanks used for storage of Industrial/process water will meet requirements for design characteristics, including dyke sizing and will have secondary containment to prevent adverse effects to the surrounding environment in the case of leaks or failures.

Records will be kept of all amounts of industrial wastewater disposed of, and the location/method of disposal.

All wastewater tracking and disposal will be completed in accordance with Alberta Environment requirements.

4.4.3.4 Domestic Wastewater / Sewage

Domestic wastewater will originate from the non-potable domestic water storage tank that is subsequently used either for safety eyewash / showers, with disposal to the oil / water separator, or for domestic use (washrooms / kitchen) with disposal in an approved septic field.

Sewage will be generated during construction, operations and reclamation of the Project. Sewage generated during construction and reclamation activities by workers will be managed in portable toilets operated by a commercial vendor.

Temporary storage and hauling to an approved disposal site were considered for domestic wastewater and sewage for the life of the PLPP. However, a septic field system was selected as the most economical alternative based on the life of the PLPP.

Sewage generated during operations will be contained within an onsite septic system including water and solids flowing to an underground tank within the boundaries of the PLPP. The design of the septic field will be subject to the findings of preconstruction requirements for permitting. The field will be sized to accommodate the soil properties encountered and the expected usage of domestic facilities. The septic tank system will be designed in accordance with *Alberta Private Sewerage Standard of Practice Handbook 2009* and addenda to Version 12 and the *Sanitary Sewage Management Guidelines for Industrial Operations*.

The septic system will be designed for estimated peak demand domestic wastewater volume.

The collection tanks will be located in accordance with the 2009 Alberta Private Sewage Systems Standard of Practice as follows (minimum distances):

- 10 m from a water source;
- 10 m from a watercourse;
- 1 m from a property line; and
- 1 m from a building.

As required, domestic biosolids will be vacuumed from the septic tanks and hauled to the nearest sewage treatment facility.

4.4.4 DOMESTIC WASTE

All domestic and industrial garbage will be disposed using approved refuse containers for hauling and disposal at an approved landfill.

Bear proof containers will be used on location for holding of domestic and industrial garbage.

4.4.5 OPERATIONAL WASTE

Table 12. Operational wastes associated with Project.

Substance	Characterization	Source of introduction	Volume variation	Management / Disposal
Used oil / grease		Pump / motor maintenance	According to pump / motor maintenance schedule.	Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.
Process wastewater	Non-oily wastewater	from plant washdown (after oil separation) and water treatment wastewater		Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.
Oily Wastewater	Oil and Oily Wastewater	Oil water separator for plant area drains		Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.
Process wastewater	Wastewater with detergents	combustion turbine wash	Infrequent	Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.
Relief valve discharges	Discharged from relief valves (condensate; water/glycol mix).	Housekeeping; system upsets	Intermittent	Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.

Substance	Characterization	Source of introduction	Volume variation	Management / Disposal
Domestic grey water, black water	Sink and shower drains, toilet.	Septic tanks		Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.
Solid wastes	Housekeeping cleaning rags, parts packaging, paper	General maintenance and operations	Will vary daily	Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.
Exhausted Resin from Condensate Polisher	Ammonia-form powdered resin with iron oxides, chlorides, and silica contaminants	Condensate Polisher System	Will vary based on plant operational load variability and presence of contaminates in system (typically every 2 weeks).	Disposed by an approved 3 rd party disposal vendor licenced to handle and transport industrial waste.

4.5 ANTICIPATED CONSTRUCTION, OPERATION, AND DECOMMISSIONING SCHEDULES

The following are the estimated project timelines and major milestones. Decommissioning is estimated at a 30 year timeline.

Table 13. Project Timelines

TASK	DATE
Summary of Power Project Construction	
Site Access for Construction Mobilization	2020-05-30
Equipment Delivery	2021-02-13
Back Feed Power Available	2021-10-11
Fuel Gas Available	2021-12-10
Mechanical Completion	2022-04-28
EPC COD / Initial Operation	2022-11-01
Site Preparation	
Site Mobilization	2020-06-28
Site Improvement	2020-07-30

TASK	DATE
Infrastructure Construction	
Piling	2020-09-24
Foundation Installation - CTG & HRSG	2020-10-27
Foundation Installation - CTG Building	2020-11-26
Foundation Installation - STG	2020-12-26
Foundation Installation - Field Erected Tanks	2021-01-10
Foundation Installation - ACC	2021-01-25
Foundation Installation - STG Building	2021-02-09
Foundation Installation - GSU Transformers	2021-02-24
U/G Utilities	2021-02-25
Erect CTG Building	2021-04-25
Foundation Installation - BOP	2021-05-25
Erect STG Building	2021-06-09
Install Field Erected Tanks	2021-06-12
Erect Maintenance/Warehouse Building	2021-07-31
Erect Control/Administrative Building	2021-08-23
Erect HRSG Penthouse	2021-09-11
Install Distributed Control System	2021-10-08
Water Treatment System	2021-10-29
Instrumentation Installation	2022-04-07
Install GSU Transformers #1	2021-10-30
Install GSU Transformer #2	2021-11-29
Install STG	2022-01-18
Install CTG	2022-01-20
Install HRSG	2022-02-08
Install Air Cooled Condenser	2022-02-20
A/G Piping Installation	2022-03-19
A/G Electrical/Electrical Equipment	2022-04-02
Instrumentation Installation	2022-04-07
Start Up and Commissioning	
Energize GSU Transformer #1	2021-11-14
Energize GSU Transformer #2	2021-12-13

TASK	DATE
Commission CTG	2022-03-03
Checkout/Commission HRSG - Pre Turbine Firing	2022-03-08
Initial Fire Combustion Turbine	2022-03-13
Partial Load Run - Combustion Turbine	2022-03-20
Steam Blows & Pipe Restoration - HRSG	2022-04-10
Commission STG	2022-04-14
Steam to Condenser By-pass Operation	2022-04-24
Initial Roll Steam Turbine Generator	2022-04-28
Plant Fine Tuning	2022-07-13
Emissions Testing	2022-07-27
Noise Level Testing	2022-08-03
Plant Testing	2022-08-10
Commercial Operation Date	
Target Completion	2022-11-01
Decommissioning & Reclamation	
Decommissioning	2052 - 2053
Surface Reclamation	2053 - 2055
Reclamation Certificate	2055

Physical activities will include:

1. Site preparation
2. Infrastructure Construction
3. Operations and maintenance
4. Decommissioning and abandonment

4.5.1 SITE PREPARATION¹⁶

Site preparation, excavation, backfill, and grading will be performed as required to construct the PLPP and achieve finished site grades. The site will be cleared of all trees, shrubs, and vegetation to the extent necessary to construct the PLPP. This includes the required pipeline and transmission line.

1. General Soil Stripping

- Every effort will be made to perform site work, and in particular the salvaging of topsoil in a season and under conditions most suitable for that activity.
- All topsoil, organic soil, soft or weak native subgrade will be removed from the development and access road areas. All soil stripping and leveling using a two lift soil stripping method:
 1. The first lift will remove the duff layer consisting of organic matter to the color change (B-horizon);
 2. The second lift will remove the B-horizon. Both duff and B-horizons will be stockpiled with separation. Care will be taken to avoid admixing while handling and stockpiling soils. The soils will be preserved and used for production and final reclamation. The remaining C-horizon will be used as cut and fill to level each lease to accommodate the necessary equipment.
- Erosion control for wind and water erosion will be implemented as required
- The site is expected to be leveled with a balanced cut-fill operation.
- In areas of fill the subgrade may be inspected and any soft areas will be sub-cut to sufficient depth to remove the soft material and bridge to provide support for subsequent fills.
- For areas of fill more than 0.5 m thick with a stable exposed subgrade, no further site preparation is required prior to filling.

¹⁶ As recommended in Parkland Geotechnical Ltd. February 22, 2019. Geotechnical Investigation, Proposed Upstream Facility LSD 5-3-68-W6M, M.D. of Greenview South of Grande Prairie, Alberta.

- If soft subgrade conditions persist in any areas during filling or site subgrade preparation the compaction recommendations and proposed construction procedures will be reviewed.
- PLPLP confirms that “as-built” details for soil materials storage and location will be permanently kept on record. The as built information will include amount and location of topsoil stockpiles, records of cut and fill including material types.

2. Fill

Fill required to bring the site up to grade will be well graded select granular material such as sand or gravel or low to medium plastic clay. The near surface clay and clay till is considered suitable for use as engineered fill with moisture conditioning. New fills will be placed to a uniform density.

Compliance with compaction recommendation is important because poorly compacted backfill adjacent to foundation structures will settle, which may lead to ponding of surface water against foundations.

3. Site Drainage

Surface water will be drained away from the site as quickly as possible, both during and after construction.

Where excavation is carried below the groundwater surface, a dewatering system shall be installed with sufficient capacity to maintain groundwater elevation for construction activities. Contractor will be tasked with calculating the rate and volume per day that groundwater will be pumped to the surface. Discharge from the dewatering system shall be in accordance with AEP *Water Act* requirements and permits.

4.5.2 INFRASTRUCTURE CONSTRUCTION

Guidelines for how the various phases of the work will be executed, from planning to physical construction, erection, and infrastructure interconnection, are currently being developed so that the various assets are constructed as required. Construction methods will be highly detailed, but a general summary is provided below.

Table 14. Typical Construction phases

Phase	Details
Civil	<ul style="list-style-type: none"> • Construction of temporary work space(s) • Construction of base pads and pilings • Delivery and set up of temporary facilities – construction offices, workers trailers, temporary washroom facilities, etc. • Construction equipment delivery • Installation of erosion and sediment control structures • Site grading • Compaction testing • Excavation of foundations • Installation of site drainage (aka - weeping tile) at foundations • Installation of re-bar at foundations • Installation of below-ground infrastructure • Installation of equipment bases • Pouring of concrete for foundations • Testing of concrete foundations • Backfilling of foundations with previously excavated soils
Buildings and Components	<ul style="list-style-type: none"> • Component delivery • Crane delivery • Delivery of building materials • Installation of foundation • Installation of building support systems • Installation of building structure • Installation of building equipment, component • Wiring, terminations, connections, etc.

Phase	Details
Substation	<ul style="list-style-type: none"> • Delivery of equipment • Installation of equipment foundations and station ground grid • Installation of equipment support structures • Installation of transformer, switch gear, protection and control systems, control building, conduits, wiring, and terminations • System testing

4.5.3 OPERATIONS AND MAINTENANCE

Day to day operation, maintenance, safety and security will be provided by a staff of operators, engineers and support staff totaling approximately 20 persons (actual numbers TBD).

Operations management will include managing personnel, energy inputs to the facility from natural gas, operational requirements of the infrastructure, emissions and control monitoring during operations, and energy output to the electrical transmission grid. Within each of these tasks there are detailed design processes that will be developed.

Maintenance management will include regularly scheduled maintenance of infrastructure and the Project areas, including annual plant turnarounds as required, in addition to unscheduled maintenance.

4.5.4 DECOMMISSIONING AND RECLAMATION

The design life of the PLPP is approximately 30 years however the actual life span is dependent on the plant's continuing economic and technical viability. Decommissioning will adhere to the applicable Alberta regulations, permits and licences in place at that time.

A conceptual Reclamation Plan has been developed and submitted to AEP as a required component of the Industrial Approval Application. Decommissioning and removal of equipment and surface reclamation of soils, vegetation and wildlife habitat will adhere to the applicable Alberta regulations, permits and licences in place at the time. The timeline for Decommissioning and Reclamation would be expected to occur over 3 years.

4.6 ACCIDENTS & MALFUNCTIONS & EMERGENCY REPOSES

In order to effectively prevent and manage accidents and malfunctions, the PLPLP Core Emergency Response Plan (CERP) will be used as the guidelines for responding to incidents.

This plan identifies, defines and recommends actions for dealing with incidents that could impact facilities within the plan. This plan provides a logical and responsible approach to classifying and responding to incidents and includes detailed communication plans. Due to the size of the plan, only the table of contents is provided for reference (Appendix N - Emergency Response Plan). The full plan can be provided upon request.

The CERP includes a detailed Crisis Communication Plan for notifications to affected persons and more specifically includes indigenous peoples and communities.

As per commitments and requirements of the Alberta Industrial Approval, PLPLP will implement site specific emergency response plans and environmental management to ensure that the integrity of the underlying and surrounding environment is not adversely affected, and that contamination of the surrounding surface water, groundwater, soil and air will be reasonably avoided during all stages of construction and operations in the event of an accident or malfunction.

Below is a list of potential failures that could take the power plant off-line or alter the output and the mitigations to reduce potential effects.

Table 15. List of potential infrastructure failures and mitigation

Potential Failure	Mitigation
Transmission Line (T-Line) Failure	Redundant T-lines with adequate separation. For PLPP, there will be dual lines, each of which is sized for the combustion turbine. Therefore, if a T-line fails, the system can reduce the plant power output and deliver partial output.
Generator Step-up (GSU) Transformer Failure	If failure occurs for the steam turbine GSU, the plant can be operated at partial load with the combustion turbine remaining on-line. If failure is with the combustion turbine, the entire plant will be shut down. It is not common to have redundant GSU transformers installed for these facilities.

Potential Failure	Mitigation
Turbine Generator Failure	If failure occurs for the steam turbine generator, the plant can be operated at partial load with the combustion turbine remaining on-line. If failure is with the combustion turbine generator, the entire plant will be shut down.
Turbine Mechanical Failure	If failure occurs for the steam turbine, the plant can be operated at partial load with the combustion turbine remaining on-line. If failure is with the combustion turbine, the entire plant will be shut down.
Isolated Phase Bus Duct Failure (transmits generated power from turbine Generator to GSU)	If failure occurs for the steam turbine iso-phase bus duct, the plant can be operated at partial load with the combustion turbine remaining on-line. If failure is with the combustion turbine iso-phase bus duct, the entire plant will be shut down.
Loss of fuel gas supply to site	Plant could be equipped with independent, redundant gas supplies.
Subsystems (electrical, mechanical, control)	Systems have built in redundancy such that the failure of one item can be overcome by use of the redundant back-up.

4.7 ECONOMIC CONDITIONS

4.7.1 ELECTRICITY SUPPLY AND RATES

The current state of the electricity grid in Canada differs by province. In addition, the transmission infrastructure, resource siting and demand requirements mean that electricity supply options can be quite site, or locally specific.

Natural gas power generation (NGPG) is one of the most widely installed baseload electricity generation technologies in North America. (Doluweera, et al., 2018) NGPG development has been driven by relatively low capital cost requirements, higher efficiency, lower natural gas prices, and lower environmental pollutant emissions than existing coal powered options.

It is estimated that Canada has more than 1,100 Tcf of remaining marketable natural gas resources, with 79% of it in the Western Canada Sedimentary Basin (WCSB), 11% in northern Canada, 8% on the east coast, and the remaining 2% on the west coast, Ontario and Quebec. (Doluweera, et al., 2018) Canadian natural gas production activity mirrors the concentration of the available resources. The WCSB saw the majority of production. Over the next 20 years, the WCSB is expected to represent almost 99.99% of Canadian production as production declines are seen in every other Canadian producing jurisdiction and total Canadian natural gas production is expected to increase over the next 20 years (Doluweera, et al., 2018).

Electricity generation from natural gas will not be constrained by a lack of the resource in any province except PEI and NL where natural gas transportation and distribution infrastructure do not exist (Doluweera, et al., 2018).

The levelized cost of electricity (LCOE) is a key metric used in rate analysis. The LCOE is presented in cents per kWh, is a metric that represents the cost of constructing and operating an electricity generation plant. It is a standard metric used for screening and comparing different power generating options. A 1% increase in natural gas prices would increase the LCOE of NGPG by 0.3-0.6% (Doluweera, et al., 2018). The Doluweera et al. study further indicates that NGPP LCOE rates were approximately 5.4 cents / kWh in Alberta (in 2015). This puts only power production LCOE rates from biomass and wind as a lower cost power production option (Doluweera, et al., 2018).

The PLPP is a privately owned project that will supply energy to the Alberta Interconnected Electric System under the wholesale electricity market. The wholesale electricity market in Alberta is currently an energy-only model, meaning that generators are only paid for the energy they produce.

“Suppliers such as PLPP enter offers (in price-quantity pairs of their available capability) seven days ahead of the delivery hour, or settlement interval (T). Suppliers are able to change volumes at any time and can change the price up to two hours before the settlement interval. Suppliers cannot make any changes to their offered price after this point (T-2).

Using this price-quantity offers, a merit order is created by sorting offers from the lowest-priced to the highest-priced for each hour of the day. The AESO’s system controllers dispatch the lowest-priced offers from the bottom of the merit order first and move up towards the higher-priced offers until all electricity required to meet demand has been dispatched. The last offer dispatched to meet demand sets the system marginal price (SMP) for electricity. For example, if offers in the merit order are priced from \$0 to \$100 and the last offer dispatched to meet demand is priced at \$40, the SMP is \$40.

The SMP is an equilibrium price that reflects the intersection of supply and demand in real time in the electricity market. The SMP is set on a minute-to-minute basis and is used in the calculation of the hourly settlement price, also known as the pool price. The pool price is calculated as the average of all 60 one-minute SMPs in each hour and is posted at the end of the hour (ex poste). Both the SMP and the resulting pool price reflect the economic and orderly dispatch of the merit order, and accordingly reflect market economics.”¹⁷

One area that is quite challenging to provide reliable cost estimates is transmission interconnection costs. To provide the full transmission cost and impact of the PLPP to the system, the entire electric system level assessment is required. Such analysis is beyond the scope of this study. Even estimating the cost of incremental transmission links required is challenging as it requires information about existing bulk power transmission systems.

As noted, then, the PLPP has limited control on either the accessibility and/or affordability of energy, except in the PLPP ability to provide dispatched energy at market rates dictated by the

¹⁷ Alberta Electrical System Operator. Guide to Understanding Alberta’s Electricity Market. 2020. <https://www.aeso.ca/aeso/training/guide-to-understanding-albertas-electricity-market/>

AESO. Generation from intermittent resources, such as wind or solar is determined by environmental conditions. As a result, intermittent resources cannot be dispatched to run in response to changes in customer demand or market prices, and therefore have low dependable capacity. In contrast, non-intermittent resources such as the PLPP are highly dispatchable. The PLPP can respond quickly to variations in system demand and can provide ancillary services such as voltage regulation. As the direct effects on energy costs are dictated by the Alberta energy market at the time of energy dispatch, the overall effect of the PLPP on domestic energy costs is outside the control of the PLPP. The estimation of the full system integration cost of generation technologies requires power system level simulation studies, which are beyond the scope of this assessment.

With federal regulations prohibiting coal-fired electricity, natural gas-fired generation remains as the only feasible option for large scale fossil fuel-fired generation. Due to lower natural gas prices, continuing supply, and dispatchable energy, the PLPP offers a low cost, dependable option for electricity generation in Alberta.

5 PROJECT LOCATION

5.1 DESCRIPTION OF PROJECT LOCATION

The Project is located about 35 km south of Grande Prairie, Alberta, within the Municipal District of Greenview #16. The site is just northeast of the Canfor 2000 Road turnoff from Alberta Highway 40.

The PLPP is located in LSDs 8, 9, Section 4, and LSDs 5, 12, Section 3, Township 68, Range 5, West of the 6th Meridian.

5.1.1 SITE MAPS

Please refer to:

- Figure 1. PLPP Location
- Figure 11. 2018 Aerial photo of PLPP
- Figure 13. Grizzly Bear and Trumpeter Swan Habitats
- Figure 14. Parks and Recreational Areas
- Figure 15. Indigenous Reserves
- Figure 16. Wetlands and Watercourses

5.1.2 SITE PLAN

Please refer to Figure 8; and Figure 9.

5.1.3 SITE PHOTOS



Photo 1. Regrowth on south side of PLPP lands



Photo 2. Clearcut on central portion of PLPP lands.



Photo 3. Facing north on PLPP location, approximately 200m south of northern boundary.



Photo 4. Facing west from approximate middle of PLPP lands.



Photo 5. Facing south through PLPP from north boundary.

5.1.4 PROJECT PROXIMITY

5.1.4.1 Existing Residences

Located to the south and southeast of the project are existing oil and gas facilities, which include well pads, compressor stations, and gas plants.

The closest permanent and/or seasonal residence is located 10.3 km northwest of the PLPP lands.

There is a temporary work camp located approximately 1.9 km southeast of the Project. The Work camp is operated by the CNRL gas plant and is found within the 1.5 km boundary of that facility.

Please refer to Appendix F - Consultation Program for further information and figures.

5.1.4.2 Indigenous Groups Traditional Territories

In accordance with Alberta's Indigenous Peoples and Métis Settlements policies and guidelines (<http://indigenous.alberta.ca/1.cfm>), the Alberta Aboriginal Consultation Office indicated that the PLPLP is located within the traditional territories of the Gift Lake Métis Settlement; Horse Lake First Nation; and the Sucker Creek First Nation.

5.1.4.3 Indigenous Reserves and Metis Settlements

Please refer to Figure 15 for a map of the First Nation Reserves and Metis Settlements in proximity to the PLPP. The following provides distances to the Reserves and Settlements:

- Sturgeon Lake IR #154B, located 69 km east/northeast
- Horse Lake IR #152B, located 84 km northwest
- Alexander IR #134A is located approximately 157 km southeast
- Gift Lake Metis Settlement located approximately 200 km northeast
- Duncan IR #151A located approximately 147 km northeast
- William McKenzie IR #151K, located approximately 171 km northeast

- Sucker Creek IR #150A located approximately 170 km northeast
- Kapawe’no IR #230 located approximately 180 km northeast

5.1.4.4 Federal Protected Areas

No federal protected areas are located within 130 km of the PLPP. (Figure 14)

5.1.4.5 National Parks

The closest national park is Jasper National Park, located approximately 130 km south of the Project. Please refer to Figure 14.

5.2 LAND USE

The PLPP is within the Municipal District of Greenview #16. The Project is located on provincial crown land, which is primarily public land managed for timber production, energy development, fish and wildlife, recreation, and other miscellaneous uses.

The lands were cleared of all salvageable timber approximately 5 years ago. Figure 11. 2018 Aerial photo of PLPP accurately represents site conditions.



Figure 11. 2018 Aerial photo of PLPP

The lands within the MD are not zoned for purposes of the MD Land Use Bylaw. The Project, then, is an acceptable land use in terms of the Land Use Bylaw and Municipal Development Plan. A mineral information land index search was conducted for the Project Area prior to surveying and surface lease DML application to ensure that no other entities had subsurface rights for the Project Area.

In order to determine existing restrictions on the lands / land use, the Alberta Landscape Analysis Tool (LAT) was searched. LAT is a web-enabled geo-spatial mapping tool that identifies base and sensitive landscape features and how they interact with a proposed land location and activity being considered on Alberta Government Public Land. It provides users the ability to view and map their proposed project and generate a LAT report required for all Alberta public land disposition applications. The specific and applicable approval standards and operating conditions associated with a disposition application are identified on a valid LAT report. The results of the LAT Report did not indicate any applicable land use, water use, resource management or conservation plans applicable to the PLPP lands.

Engagement with the three Indigenous Peoples registered with the ACO as having traditional lands in the area has not identified traditional use of the Project perimeter or within the Project Area by their individuals. Letters have been sent to the Métis Settlements near the area informing them of the Project. PLPLP will continue to reach out to those communities to ensure that they do not have any concerns. Engagement will continue through the development, operation, decommissioning, and reclamation phases of the Project.

Based on the current information received from Indigenous groups to date, the Project will not require access to, use or occupation of, or the exploration, development and production of lands and resources currently used for traditional purposes by Indigenous peoples.

5.3 HEALTH, SOCIAL AND ECONOMICS OF MD OF GREENVIEW #16

The MD of Greenview encompasses approximately 32,000 km² and includes the town of Grande Cache. As of 2018 had a resident population of 9,223 persons¹⁸. Between 2013 – 2018, the MD

¹⁸ MD of Greenview. Review the Business Climate. Online.
<https://expandyourvision.ecdev.org/business-climate>

had a population growth rate of -3.9%. In 2015, the median age within the MD was 37.9 years and the median individual income was \$45,552. In 2017, net municipal taxation within the MD amounted to \$76,787,405.¹⁹

5.3.1 PROJECT ACTIVITIES AND SOCIO-ECONOMIC CONDITIONS INTERACTIONS AND EFFECTS

The Project has three distinct phases with specific project activities.

Table 16. Potential Interactions with Project Activities and Socioeconomic Conditions

Project Phase	Duration	Relevant Project Activity
Site Preparation and Construction Phase	1 Year	<ul style="list-style-type: none"> • Clearing, grubbing and grading • Drilling for foundations • Soils management • Surface infrastructure installation and construction, including lighting • Local traffic bypass road construction • General waste management
Operations Phase	25 years	<ul style="list-style-type: none"> • Operations at the facility
Closure Phase: Reclamation Stage	2-3 years	<ul style="list-style-type: none"> • Infrastructure demolition • Site reclamation • Environmental monitoring • General waste management

The Project will have positive impacts on the local and regional employment market. In August of 2019, Statistics Canada stated the economic region which houses Grande Prairie and Peace River had a 5.2 percent unemployment rate. The Project could increase participation in the labour force and provide opportunities for in-migration and population growth of Grande Prairie, but it may be that existing persons would more likely benefit from the Project.

¹⁹ MD of Greenview No. 16 Financial Statements for the year ended December 31, 2017.

The economic output of the Project is as follows:

- Between 2018-2019, approximately \$1.5 million was spent on project design.
- The construction phase will generate \$400 million in value added for the local economy, supporting 300 jobs.
- Operating activities would generate \$30 million in value added annually, supporting 75 jobs annually and provide provincial and municipal government revenues. The expected taxation has not yet been determined.

PLPP is an equal opportunity employer and it is expected that employment will be of a fix term nature and upon closing of the Project, the jobs will cease. The Proponent does have other Project sites. However, as technical expertise is increased, there will be opportunity to transfer employees to other similar Projects, developed by other proponents.

There is likely limited potential population growth and activity associated with the Project. Therefore, there would be almost no increased pressure for medical services or other local health care service providers. However, these is a lack of data on which to make final conclusions and there are many variables that could impact health care services, such as if another doctor is recruited to the area and if the labour force associated with the Project lives in the area. Health Care service providers and infrastructure may be vulnerable if increased population growth occurs.

With local employment opportunities, there may be increases in population, creating pressure on local housing markets, both ownership and rental, to accommodate new workers or immigration to the area. Given the lack of a rental market, this provides opportunity for local builders and developers to meet a market need.

The Proponent may establish an office in Grande Prairie to provide a place for the public to ask questions and provide a point of contact for community members. In this location, the public will be able to submit resumes, ask questions about the Project, integrate into the local business community and create connections with the local community.

6 FEDERAL INVOLVEMENT

6.1 FEDERAL FINANCIAL SUPPORT

The PLPP does not include any proposed or anticipated federal financial support.

6.2 FEDERAL LANDS

No federal lands will be used for the PLPP or associated activities for the purposes of carrying out the Project, nor will there be any granting of interest in federal land required.

6.3 FEDERAL LEGISLATIVE OR REGULATORY REQUIREMENTS

The PLPP is captured in the *Physical Activities Regulations*: SOR/2019-285, Schedule, 30 and the operation of the PLPP will also be regulated under the Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity (SOR/2018-261).

There are no other confirmed federal legislative or regulatory requirements (including any federal permits, licences or other authorizations) applicable to the Project at this time.

7 ENVIRONMENTAL EFFECTS

In 2019, a desktop environmental analysis, followed by field assessments were completed for the PLPP.

7.1 ENVIRONMENTAL ASSESSMENTS

On September 18 and 19th, 2018 a site assessment of the Project lands was completed by Robert McCallum, P.Biol. On June 10, 2019 additional assessments were completed for vegetation by Clint Gellrich, P.Biol. wetland, watercourse and vegetation surveys of the transmission line routes were completed June 10 to 15, 2019.

The following is summary of findings from the site assessment and desktop analysis. The purpose of the surveys was to document wildlife use within the PLPP in order to eliminate or minimize impacts to local wildlife from the proposed development, and to aid in the planning process for the Project.

Pre-development planning included:

- 1) Development of a priority list of species for each taxonomic group was completed based on a compilation of listed species from the following sources:
 - i. Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Federal Species-at Risk Act (SARA). All species listed as Endangered, Threatened, or of Special Concern;
 - ii. Species listed in the Alberta *Wildlife Act* as Endangered, Threatened, or of Special Concern;
 - iii. Fish & Wildlife Management Information System (FWMIS) database search; and,
 - iv. Provincial Wildlife Sensitive feature spatial data layers in GIS-usable format that require GIS software such as ESRI® ArcGIS and are provided in the following WinZip files for each sensitivity layer from AEP.
- 2) This priority list of species was narrowed by broad geographic area. The priority list of species was then further narrowed by identifying specific habitat requirements for each species. For example, if a species required open water lake habitat, and no open water lake habitat was present inside the Project footprint, this species would not be carried forward to the final list of priority species for field assessments;

- 3) Review of aerial photos and online maps and government data sources for the general project region; and,
- 4) Preliminary and cursory assessment of the Project lands in the field to understand local and project related land use, determine access, and determine limitations be encountered prior to initializing environmental assessments.

For the purpose of this report, priority species consist of Species at Risk (SAR) and species of conservation concern:

- SAR: Species listed federally under SARA and provincially under the Alberta *Wildlife Act* as Endangered, Threatened or of Special Concern;
- Species of conservation concern: Species listed under COSEWIC as Endangered, Threatened or of Special Concern.

7.1.1 DESKTOP REVIEW

A desktop review was conducted to determine historic and potential wildlife species of concern occurrences in the PLPP area.

The following were reviewed prior to the wildlife assessment to determine potential sensitive species in the area and to develop proposed mitigation measures when warranted by the confirmed presence of species of management concern.

1. The Alberta Fish and Wildlife Internet Mapping Tool (FWIMT) was used to identify wildlife species at risk or of concern that have been previously observed within five-kilometer radius of PLPP centroid.
2. Alberta Environment and Sustainable Resource Development (ESRD, 2013) *Sensitive Species Inventory Guidelines*
3. Alberta Sustainable Resource Development (Alberta Environment & Parks, 2019) *The General Status of Alberta Wild Species 2015*
4. Government of Canada Species at Risk Public Registry (Government of Canada, 2019)
5. Provincial Wildlife Sensitive feature spatial data layers in GIS-usable format that require GIS software such as ESRI® ArcGIS and are provided in the following WinZip files for each sensitivity layer from AEP.
6. Alberta Conservation Information Management System (ACIMS) database search.

7. Landscape Analysis Tool (LAT) Report - The Landscape Analysis Tool (LAT) is a web-enabled geo-spatial mapping tool that identifies base and sensitive landscape features and how they interact with a proposed land location and activity being considered on Alberta Government Public Land. It provides users the ability to view and map their proposed project and generate a LAT report required for all Alberta public land disposition applications.

7.1.2 WILDLIFE SURVEYS

Surveyors inspected trees, tall shrubs, and man-made structures for the presence of nests within and adjacent to the PLPP area. Wildlife searches included both incidental observations recorded during other wildlife survey activities, and targeted searches (primarily outside of the proposed PLPP boundary). The inspection of adjacent lands was conducted up to 1000 m from the proposed PLPP boundary. Due to land access constraints outside of the proposed PLPP area, potential habitat features were inspected visually with the aid of binoculars. Confirmed or suspected sites were recorded in UTM NAD83.

7.1.3 VEGETATION SURVEYS

Vegetation surveys were completed in 2018 and 2019.

7.1.4 WETLAND SURVEYS

Under the Wetland and Delineation directive, the wetlands have been delineated per Pathway 3 – simple desktop delineation and verification. “Pathway 3 is followed when the wetland boundary is obvious and simple to delineate, and imagery is available. In pathway 3, the desktop delineation is done by a desktop assessment, but the wetland boundary is subsequently verified in the field at a representative number of points using a GPS unit.”

On October 5th and 6th, 2016, the PLPP lands were assessed for wetlands. Using the previously built data base for wetlands, anticipated wetland locations were known. Wetland delineation was completed by Robert McCallum, P.Biol. Boundary determination was based on micro-topography and observed surface hydrology and vegetation.

7.2 PHYSICAL AND BIOLOGICAL SETTING

7.2.1 AIR QUALITY

Please refer to Section 4.4.1 - Air

7.2.2 ALBERTA CONSERVATION INFORMATION MANAGEMENT SYSTEM (ACIMS) RESULTS

ACIMS is a data centre that provides biodiversity information on Alberta's species, natural ecological communities and sites. Information about the location, condition, status and trends of selected elements is collected, updated, analyzed and disseminated. (Alberta Parks, 2019)

The results of the ACIMS search indicated:

1. No Non-sensitive Element Occurrences ('EO');
2. No sensitive EOs;
3. No Protected Areas found
4. No Crown Reservations/Notations found.

A copy of the search results is provided in Appendix I - ACIMS Data Search Results.

7.2.3 FWIMT SEARCH RESULTS

The FWIMT search identified a key wildlife biodiversity zone, located along the Smoky River (4 km east of the PLPP) and the along the Big Mountain Creek (900 metres west of the PLPP).

Both wildlife biodiversity zones are associated with winter ungulate ranges, which correspond to high ungulate use areas during winter seasons, allowing for easier passage of ungulates.

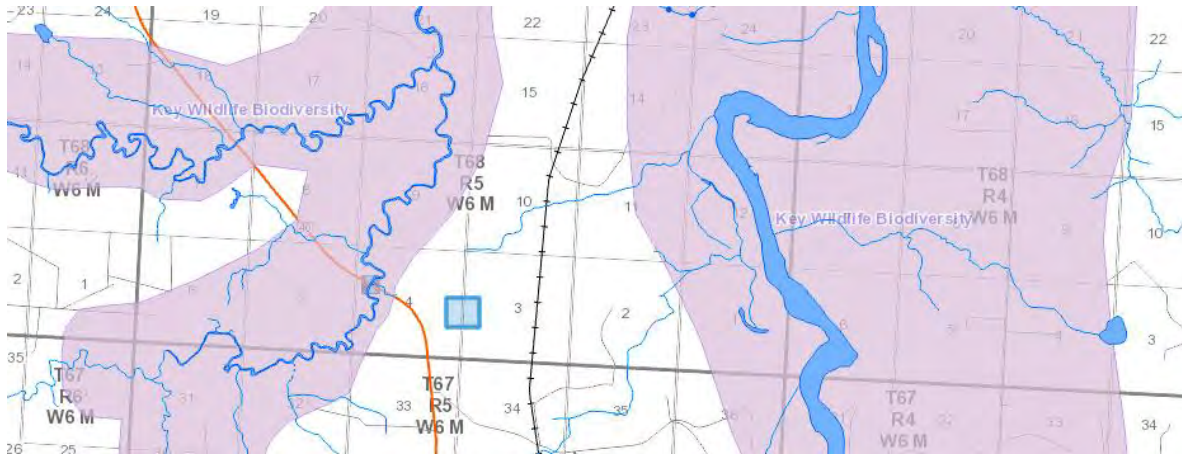


Figure 12. FWIMT Database search results²⁰

7.2.4 LAT REPORT²¹

LAT uses approximately sixty data layers, divided into two categories:

- Base Map Layers – This is a generalized view of key data layers that provide a background setting for the map. This presents the user with details at the provincial extent to help orient to the specific locations.
- Operational Layers – These layers provide specific context and detail of key data layers that can be turned on or off. Some of these layers pertain to the report processing logic of a user's proposed activities.

The specific and applicable approval standards and operating conditions associated with a disposition application are identified on a valid LAT report.

The results of the LAT Report, and associated pre-construction requirements for assessment and approval conditions is found in Appendix E - LAT Report.

²⁰FWMIT Database search:

https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub. The blue rectangle represents the PLPP project location. The figure is provided directly from the database and mapping design and functionality is limited.

²¹ <https://www.alberta.ca/lat-overview.aspx>

7.2.5 PROVINCIAL PROTECTED AREAS

No provincially protected areas or provincially designated natural areas are located within or adjacent to the PLPP boundaries.

7.2.6 PROVINCIAL RECREATIONAL AREAS

The closest provincial recreation area is the Big Mountain Creek Provincial Recreation Area, located 3.3 km north of the Project lands. The Big Mountain Creek is a group use recreation area used as an Off Highway Vehicle (OHV)/snowmobile off-loading and travel to trails from the group use area.²²

The next closest recreation area is the Musreau Lake Recreation Area, located approximately 33 km south of the Project. (Figure 14)

7.2.7 ENVIRONMENTALLY SIGNIFICANT AREAS (ESA)

ESAs are (Government of Alberta, 2016):

- Important to the long-term maintenance of biological diversity, soil, water, or other natural processes, at multiple spatial scales.
- Areas that contain rare or unique elements or that include elements that may require special management consideration due to their conservation needs.

It is important to note that ESAs do not (Government of Alberta, 2016):

- Consider how these areas are being, or how they should be, managed or conserved.
- Represent natural resource policy, areas requiring specific management objectives, or comprehensive status reporting.
- Represent government policy, and do not necessarily require or confer legal protection.
- Replace other indicator-specific mapping and planning tools, such as wetland inventories, caribou range maps, and species at risk recovery plans.

ESAs are intended as an information tool – not as a regulatory tool (Government of Alberta, 2016).

A comprehensive list of criteria, sub-criteria, and indicators were selected to identify ESAs in Alberta. Ultimately, professional judgement was used to determine a cut-off value of >0.189 for designating quarter sections as Environmentally Significant Areas in the province (FIERA Biological Consulting, 2014).

²² <https://www.albertaparks.ca/parks/northwest/big-mountain-creek-pra/>

The Project lands have an ESA scoring value rating of 0.045 (Scoring >0.189 equals Provincial ESA), which puts the Project lands in the second lowest ESA value rating category. This implies a low likelihood of:

1. Areas that contain focal species, species groups, or their habitat;
2. Areas that contain rare, unique, or focal habitat;
3. Areas with ecological integrity; and,
4. Areas that contribute to water quality and quantity.

According to the *Environmentally Significant Areas of Alberta* map and the *Environmentally Significant Areas of Alberta* (Sweetgrass Consultants Ltd., 2009) the Smoky River valley is listed as environmentally significant. The Smoky River valley is located 4.2 km east of the Project lands, with no connection by watercourses or topography to the PLPP.

7.3 VALUED ECOSYSTEM COMPONENTS (VEC)

Each VEC, including the baseline environmental work that has been completed to evaluate each VEC, is described in the following sections. Each VEC section provided below describes the results of the baseline conditions, potential effects as a result of the PLPP, mitigation measures to reduce potential effects, and the significance of potential effects (where applicable).

7.3.1 SENSITIVE SPECIES²³

The Project is not located in any Sensitive Species Ranges however the following are the closest known Sensitive Species ranges.

7.3.1.1 Grizzly Bears

The closest Grizzly Bear range is the Grand Cache Grizzly Bear Zone (Grizzly Bear Management Area 2), which is located approximately 16 km south of the Project lands.

²³ AEP Website. Wildlife Sensitivity Maps – October 2016. <http://aep.alberta.ca/forms-maps-services/maps/wildlife-sensitivity-maps/default.aspx>

7.3.1.2 Trumpeter Swans

Trumpeter Swans do not have specific “sensitive species range” within Alberta, however, as Trumpeter Swans breed on rivers, lakes and marshes, Alberta has development restrictions near known habitat. Specifically, that projects may not conduct any activities between April 1 and September 30 within 800 metres of the bed and shore of a known or identified Trumpeter Swan watercourse or waterbody, or 500 metres outside this timing window. (Environment and Parks, Government of Alberta, 2018)

Database layers from Alberta for Trumpeter Swan locations indicate that the closest known Trumpeter Swan location is 4.1 km NE of the Project.

7.3.2 SENSITIVE SPECIES WITH POTENTIAL TO OCCUR

The following table (Table 17) lists federal and provincial sensitive species with the potential to occur around the general project footprint. The determination of potential occurrence is based upon habitat preferences of the individual species compared to the habitat potential in and around the PLPP.

Table 17. Potential Sensitive Species and likelihood of occurrence.

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Birds	<i>Haliaeetus leucocephalus</i>	Bald Eagle	Sensitive	None	No	None	A species once at risk throughout much of its North American range, but now recovering; low density in Alberta. Nests vulnerable to human disturbance, and as such, require protection.	Low. No nests found
Birds	<i>Strix varia</i>	Barred Owl	Sensitive	None	No	None	Likely fewer than 2000 breeding birds in the province. This interior forest species requires larger blocks of mature dense woodland. Forest fragmentation detrimental. Forest management plans need to ensure breeding habitat retained.	Low due to lack of habitat
Birds	<i>Dendroica castanea</i>	Bay-breasted Warbler	Sensitive	None	No	None	Dependent on old-growth forest. Forest management plans need to ensure retention of breeding habitat.	Low due to lack of habitat

²⁴ Alberta Environment and Parks, Wild Status Species Search. <https://extranet.gov.ab.ca/env/wild-species-status/>

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Birds	<i>Picoides arcticus</i>	Black-backed Woodpecker	Sensitive	None	No	None	Maintenance of mature coniferous forests important. Standing dead trees (snags) required for nesting. Forestry and fire suppression practices may decrease the availability of these stand types.	Low due to lack of habitat
Birds	<i>Dendroica virens</i>	Black-throated Green Warbler	Sensitive	None	No	None	Over 10 000 individuals in the province. Designated a “Species of Special Concern” in Alberta. Habitat loss and fragmentation resulting from industrial development threaten this old-growth dependent species.	Low due to lack of habitat
Birds	<i>Dendroica fusca</i>	Blackburnian Warbler	Sensitive	None	No	None	Considered peripheral with a very restricted distribution in Alberta. Preference for mature mixedwood forests suggests it may be vulnerable to forestry operations.	Low due to lack of habitat
Birds	<i>Spizella breweri</i>	Brewer's Sparrow	Sensitive	None	No	None	Steep population decline in Alberta since 1994. Prairie population of the species relies on availability of natural sage brush. Thought to be declining because of its specific habitat requirements.	Low due to lack of habitat
Birds	<i>Buteo platypterus</i>	Broad-winged Hawk	Sensitive	None	No	None	May be experiencing major population declines as breeding habitat disappears. Requires large stands of mature to old-growth forest in the parkland and southern boreal forest. Careful woodlot management by essential to maintain breeding habitat.	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Birds	<i>Certhia americana</i>	Brown Creeper	Sensitive	None	No	None	A mature forest-dependent species that is vulnerable to forest fragmentation, and certain forest management practices.	Low due to lack of habitat
Birds	<i>Chordeiles minor</i>	<u>Common Nighthawk</u>		Special Concern	Yes	Threatened	Common Nighthawks nest in both rural and urban habitats including coastal sand dunes and beaches, logged forest, recently burned forest, woodland clearings, prairies, plains, sagebrush, grasslands, open forests, and rock outcrops.	Low due to lack of habitat
Birds	<i>Coccothraustes vespertinus</i>	<u>Evening Grosbeak</u>		Special Concern	Yes	Special Concern	Evening Grosbeaks breed in mature and second-growth coniferous forests of northern North America and the Rocky Mountains, including spruce-fir, pine-oak, pinyon-juniper, and aspen forests.	Low due to lack of habitat
Birds	<i>Aquila chrysaetos</i>	Golden Eagle	Sensitive	None	No	None	Most recent estimate suggests 100-250 breeding pairs in Alberta. Disturbance from human related activities is greatest threat. Because of its low population and dispersal over a large area, nest site inventory and protection are necessary.	Low due to lack of habitat and no nests found

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Birds	<i>Strix nebulosa</i>	Great Gray Owl	Sensitive	None	No	None	A naturally scarce species, widely distributed in foothill and boreal habitats. Requires stands of mature forest for nesting, thus is vulnerable to PLPLP.	Low due to lack of habitat
Birds	<i>Contopus cooperi</i>	<u>Olive-sided Flycatcher</u>		Special Concern	Yes	Threatened	Olive-sided Flycatchers breed mostly in the boreal forest and in western coniferous forests,	Low due to lack of habitat
Birds	<i>Pandion haliaetus</i>	Osprey	Sensitive	None	No	None	This species is uncommon, but widespread, and faces limited threats to population and habitat, including threats to nesting sites. Continued monitoring and protection of specific nest sites desirable. In all nesting areas, they use openings or edges in the forest and are rarely found in deep, closed forest—look for them in meadows, rivers and streams, partially logged areas, recent burns, beaver ponds, bogs, and muskegs. These areas often have dead or dying trees, which provide exposed perches for singing, foraging, and watching for predators and rivals.	Low due to lack of habitat. No nests found
Birds	<i>Dryocopus pileatus</i>	Pileated Woodpecker	Sensitive	None	No	None	Requires mature to old-growth trees for nesting. Essential to incorporate maintenance of breeding habitat into management plans on both public and private lands. Some threats to populations identified.	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Birds	<i>Cygnus buccinator</i>	Trumpeter Swan	Sensitive	Not at Risk	No		An estimated 166 breeding pairs occur in Alberta. Critical shortage of key winter habitat limits population growth. Breeding habitat relatively secure. Efforts underway to expand wintering areas. Designated as “Threatened” under the Wildlife Act.	Low due to lack of habitat. Identified habitat >800m away.
Birds	<i>Piranga ludoviciana</i>	Western Tanager	Sensitive	None	No	None	Prefers old coniferous and mixedwood forest; obligate neotropical migrant. Species may be vulnerable to habitat loss or deterioration by various forecast land uses, mainly timber PLPLP.	Low due to lack of habitat
Mammals	<i>Lynx rufus</i>	Bobcat	Sensitive	None	No	None	Perhaps fewer than 1 000 individuals. PLPLP of bobcats is very low, but population is presumed to be stable.	Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Mammals	<i>Lynx canadensis</i>	Canada Lynx	Sensitive	None	No	None	Cyclic species. Estimated less than 8 000 individuals at the bottom of the cycle. Population has decreased in recent years, and some concern exists over habitat loss and fragmentation. PLPLP is now set by quota.	Low due to lack of habitat and existing high level of industrial use in area.
Mammals	<i>Martes pennanti</i>	Fisher	Sensitive	None	No	None	Species considered uncommon to rare. Population status is unknown, and trends in population and distribution uncertain. Current forestry practices may reduce availability of preferred habitat. Fisher PLPLP has declined since 1985.	Low due to lack of habitat and existing high level of industrial use in area.

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Mammals	<i>Ursus arctos</i>	Grizzly Bear	At Risk	Special Concern	Yes	Special Concern	Population estimates are currently underway. Currently sustaining its population under a very restrictive sport hunting regime. Greatest threat is loss and degradation of wilderness habitats through resource extraction and recreational development.	Low due to lack of habitat and existing high level of industrial use in area.
Mammals	<i>Myotis lucifugus</i>	<u>Little Brown Myotis</u>	May Be at Risk	Endangered	Yes	Endangered		Low due to lack of habitat
Mammals	<i>Myotis septentrionalis</i>	Northern Long-eared Bat	May Be at Risk				Population size unknown, but uncommon over known range. Current forestry practices threaten habitat, as it relies on large, early decay trees for roosting. Need to incorporate habitat requirements into forest management.	Low due to lack of habitat
Mammals	<i>Myotis septentrionalis</i>	<u>Northern Myotis</u>		Endangered	Yes	Endangered		Low due to lack of habitat

Class	Scientific Name	Common Name	Alberta Status 2015	COSEWIC status	On Schedule 1 (Yes/No)?	SARA status	Comments on Species ²⁴	Likelihood of Occurrence in Project
Mammals	<i>Rangifer tarandus caribou</i>	Woodland Caribou	At Risk				Most populations declining, with some at immediate risk of extirpation. Primary threat is increased predation by wolves in response to human activity. Maintenance of old-growth forest habitat is critical. Designated as “Threatened” under the Wildlife Act.	Low due to lack of habitat. Closest population is the Little Smoky herd, with a range boundary approximately 66 km south of the project

7.3.2.1.1 Effects to Sensitive Species

Construction activities are likely to alter wildlife movement and behaviour around the Project footprint, resulting in a temporary reduction in habitat use. The area where otherwise suitable habitat might be avoided by wildlife, measured by applying an approximately 500m buffer around the Project footprint (Environment Canada 2012), will total approximately 25 ha. The majority of this kind of habitat loss is expected to occur in mixed forest habitat.

Habitat loss from sensory disturbance is likely overestimated because the Project uses existing access roads, an existing clearcut, and the transmission line and gas pipeline will parallel existing linear developments (e.g., existing transmission line). These existing developments are associated with vehicular activity, noise, and other sensory disturbances, and therefore, it is unlikely that there will be measurable losses in local habitat from sensory disturbance where it parallels existing disturbances. New sensory disturbance effects are more likely to occur in areas where the Project is not adjacent to existing disturbances

Habitat losses either through direct removal or sensory disturbance can result in changes to the distribution of available habitat (and ultimately caribou within the range) through avoidance of affected areas and localized changes in the distribution of animals. Consistent with the interpretation of Project-related habitat losses, changes to local distributions of wildlife are expected to be minor, particularly where the length of the preferred transmission route is parallel to an existing transmission line. A contraction in the range is not expected from localized changes in habitat suitability, although some displacement of animals may result from the Project during construction and operations.

Vegetation clearing along the preferred transmission and pipeline routes and for ancillary facilities (e.g., access roads, temporary workspaces) is expected to create early seral habitat, which is more favourable for moose and white-tailed deer. During the construction phase, the preferred routes will be cleared of vegetation, which could temporarily reduce movement of species until suitable vegetation cover regenerates. Mitigation will limit local fragmentation that may inhibit species population connectivity. Despite some additional fragmentation from the transmission line and temporary workspaces, moderate and high suitability habitat is expected to remain abundant and well connected across the landscape. Furthermore, the preferred routes will parallel existing linear developments. Connectivity of populations is likely already restricted by these linear features and may be further restricted with the Project.

7.3.2.1.2 Mitigation of Effects

The Project uses existing access roads, an existing clearcut, and the transmission line and gas pipeline will parallel existing linear developments (e.g., existing transmission line). This mitigates effects to habitat loss and fragmentation. In addition:

- Creation of new access for hunting and creation of new wildlife corridors has been minimized by utilizing existing linear disturbance and access.
- Implement wildlife observation reporting to appropriate site personnel during construction, operation, and decommissioning of Project
- Vehicles will yield to wildlife on roads
- Vehicles will adhere to safe speed limits
- An un-vegetated buffer along roadsides will be maintained, where practicable, to improve visibility along roadsides and reduce the potential for collisions with wildlife
- Fencing around the PLPP will be installed to prevent wildlife from accessing areas with increased risk of injuries.

Prior to construction, PLPLP will develop a detailed Environmental Protection Plan (EPP). The Construction EPP is intended to identify key environmental information, instructions and mitigation measures specific to the construction and post-construction of the PLPP.

The purpose of the EPP is to provide guidance to the Owner's employees and contractors for environmentally responsible working procedures and standards during construction. The Owner will appoint Environmental Inspectors to oversee implementation of the environmental protection measures and mitigation described in this CEPP during Project construction.

This EPP and the associated Environmental Alignment Sheets and Access and Construction Environmental Maps (for the transmission line) will be prepared to consolidate the environmental baseline data collected to date, and provide the associated environmental setting, environmental concerns, and the proposed mitigation and protection measures for construction of the Project.

The EPP will continue to be developed during the environmental planning phase of the Project, using the environmental baseline data collected, the construction methods and schedule, industry best practices, and the applicable provincial and federal regulatory requirements.

The majority of the proposed environmental protection measures and mitigation will be typical for power plant construction in the environmental setting of the Project. The EPP does not preclude any additional mitigations or commitments that will result from further consultation with regulatory agencies or engagement with Indigenous groups.

7.3.3 VEGETATION

Vegetation surveys were completed within the Project footprint. The PLPP lies in a clear-cut pine and mixedwood forest. The PLPP is dominated by regenerating non-merchantable aspen and white spruce. The lands were clear cut approximately 5 years ago.

The species composition, age, density, and health characteristics of the vegetation indicated that the majority of the vegetation communities are early-successional. Successional growth is established, and the dominant age of the trees is approximately 3-5 years.

The proportion of ground covered by the three canopy layers averaged 10%. Of total canopy cover an average of 20% was composed of preferred seedlings and saplings with <5% consisting of decadent or dead wood species. This indicates that the primary canopy cover is limiting successional growth in the secondary under-story.

In general, all areas averaged 100% vegetation cover (includes live and litter cover) and displayed characteristics of a clear-cut. Assessment of percent of areas covered by weed species revealed less than 5% invasion at all assessment areas in forested areas.

Table 18. Vegetation Identified on PLPP lands

Common Name	Scientific Name	2015 Alberta Rank	Origin
Common Fireweed	<i>Chamerion angustifolium</i>	S5	Native
Balsam Poplar	<i>Populus balsamifera</i>	S5	Native
Blue-joint Reedgrass	<i>Calamagrostis canadensis</i>	S5	Native
Woodland Horsetail	<i>Equisetum sylvaticum</i>	S5	Native

Common Name	Scientific Name	2015 Alberta Rank	Origin
Common Dandelion	<i>Taraxacum officinale</i>	SNA	Exotic
Common Plantain	<i>Plantago major</i>	SNA	Exotic
Aspen	<i>Populus tremuloides</i>	S5	Native
Common Red Raspberry	<i>Rubus idaeus</i>	S5	Native
Wild Strawberry	<i>Fragaria virginiana</i>	S5	Native
Northern Bedstraw	<i>Galium boreale</i>	S5	Native
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	S5	Native
Canadian Gooseberry	<i>Ribes oxycanthoides</i>	S5	Native
Speckled Alder	<i>Alnus incana</i>	S5	Native
Prickly Rose	<i>Rosa acicularis</i>	S5	Native
Common Horsetail	<i>Equisetum arvense</i>	S5	Native
White Spruce	<i>Picea glauca</i>	S5	Native
Red-osier Dogwood	<i>Cornus stolonifera</i>	S5	Native
Four-line Honeysuckle	<i>Lonicera involucrata</i>	S5	Native
Common Nettle	<i>Urtica dioica</i>	S5	Native
Red Clover	<i>Trifolium pratense</i>	SNA	Exotic
Narrow-leaved Hawkweed	<i>Hieracium umbellatum</i>	S5	Native
Fringed Brome	<i>Bromus ciliatus</i>	S5	Native
Timothy	<i>Pleum pratense</i>	S5	Native
Bebb's Willow	<i>Salix bebbiana</i>	S5	Native

7.3.3.1 Effects of the Project

Regardless of mitigation implemented, vegetation removal is required, and all vegetation will be removed during construction on those areas required for construction and then operations.

Once vegetation is removed and the PLPP becomes operational noxious or prohibited noxious weeds²⁵ may be expected on disturbed soils until re-seeded vegetation becomes established.

²⁵ As listed in the Alberta Weed Control Regulations, 19/2010.

7.3.3.2 Mitigation

PLPLP will re-seed all soil storage areas to limit the spread of weeds onto disturbed soils. PLPLP will conduct regular monitoring and management of weeds until it has demonstrated that noxious, prohibited, and invasive species on the project's disturbance footprint have been removed, eradicated or controlled.

PLPLP will take the following approach to vegetation management:

1. Identification
2. Prevention
3. Chain of Custody
4. Procedures for Vegetation Control
5. Monitoring

7.3.4 SOILS

In 2019 a geotechnical investigation was completed for the Project lands to provide baseline data to support engineering designs. Although the results are not provided in their entirety, the following is summarized from that assessment.²⁶

- Between January 14 and 20, 2019, twenty-four boreholes were drilled. The boreholes extended to depths ranging from 12.5 to 30.5 m.
- The general soil profile at this site consisted of, in descending order; peat, clay and clay till. Bedrock was not encountered within the depths drilled (i.e. to elevation 651 m).
 - Duff Layer: Surficial peat up to 200 mm thick was encountered in all boreholes except for one. The peat contained little topsoil, root and organic inclusions. The peat was generally damp but appeared to be moist in certain areas on site.

²⁶ Parkland Geotechnical Ltd. February 22, 2019. Geotechnical Investigation, Proposed Upstream Facility LSD5-3-68-W6M, M.D. of Greenview South of Grande Prairie, Alberta. The Geotechnical report was provided to support construction and the Industrial Approval application but is not provided in this Project Description.

- Clay: Lacustrine clay was encountered below the peat in all 24 boreholes and continued to depths ranging from 0.7 to 5.6 metres below ground (mbg). The deepest clay deposits were found in the northwest corner of the study area. Clay in the initial plant area were 1.5 to 5.6 m thick.
- Clay Till: Clay till was encountered below the lacustrine clay in all boreholes at depths ranging from 0.7 to 5.6 mbg. The clay till extended beyond the depths drilled in all boreholes.

7.3.4.1 Effects of the Project

Construction actions were identified, which may contribute to effects on soils within the Project area. These actions are closely tied to those acting on vegetation. The actions affecting soils may include:

1. Reduction in soil quality – as a result of soil stripping, resulting in mixing of soils, there may be a reduction in soil quality.
2. Compaction - The fine texture of soils makes them extremely susceptible to soil massing (where air space in the soil is lost) or compacted (where soil structure is almost completely eliminated). Compaction poses a challenge to reclaiming the site as plant roots have difficulty penetrating such soils and slow movement of water into and through these soils results in effective drowning of plant roots.
3. Water erosion - risk relates to the potential for the soil to be mobilized by water, particularly when disturbed through construction activities or a high degree of traffic. Forest soils, in Alberta, are generally fine textured (clays and clay loams) making them extremely susceptible to erosion. Erosion generally begins as sheet erosion where surface soil particles are moved by water flowing across the soil surface.

7.3.4.2 Mitigation

Soil stripping and leveling will be completed. A Construction and Reclamation Plan has been completed to provide further mitigation and soil handling is summarized as follows:

- The first lift will remove the Duff to the colour change (B-horizon) with some mixing of the B into the duff layer expected;

- The Duff / B horizon will be stockpiled north edge of the work area (Appendix K) of the lease. Care will be taken to avoid admixing while handling and stockpiling soils. The soils will be preserved and used for production and final reclamation. The remaining C-horizon will be used as cut and fill to level each lease to accommodate the necessary equipment as per Section 0 (repeated below).
- There are no slopes >5% within the PLPP lands so erosion due to high slopes will not occur.
- Some of the original impacts resulting from the construction activities will be reduced during the operations phase through revegetation of areas that were subject to temporary disturbances during the construction phase.
- The site is expected to be leveled with a balanced cut-fill operation. Detailed grading plans were not available at the time of reporting;
- In areas of cut and fills less than 0.5 thick, the exposed subgrade soils in areas should be scarified to a minimum depth of 150 mm;
- In areas of fill the subgrade may be inspected and any soft areas should be sub-cut to sufficient depth to remove the soft material and bridge to provide support for subsequent fills;
- For areas of fill more than 0.5 m thick with a stable exposed subgrade, no further site preparation is required prior to filling;
- If soft subgrade conditions persist in any areas during filling or site subgrade preparation the compaction recommendations and proposed construction procedures should be reviewed;
- Fill required to bring the site up to grade will be well graded select granular material such as sand or gravel or low to medium plastic clay. The near surface clay and clay till is considered suitable for use as engineered fill with moisture conditioning. New fills will be placed to a uniform density;
- Compliance with compaction recommendation is important because poorly compacted backfill adjacent to foundation structures will settle, which may lead to ponding of surface water against foundations;
- Fill placement and compaction during the winter months is not recommended due to the difficulty in moisture conditioning fill soils and obtaining high compaction levels.

Materials and methodology should be reviewed prior to construction if cold weather compaction of clay fills is proposed. High compaction levels can only be achieved using fill soils that are unfrozen provided the compaction are is heated and hoarded to prevent freezing during placement and compaction.

7.3.5 GROUNDWATER

A relatively deep groundwater table is considered typical in this area²⁷. The observed groundwater conditions suggest a deep groundwater table with shallow seasonal perched conditions in the upper clay and clay till deposits.

The local groundwater table is considered to be recharged by infiltration of precipitation. The site is covered by low permeable soils which restrict groundwater infiltration and lateral movement. Groundwater elevations are expected to fluctuate on a seasonal basis and will be highest after periods of prolonged or heavy precipitation and snow melt. Seasonally high groundwater levels and perched conditions will dissipate as groundwater infiltrates down to the static groundwater table during drier periods. Groundwater seepage may be expected for shallow excavations on this site.

7.3.5.1 Effects of the Project

Groundwater is an integral part of the hydrologic system and serves as a water resource that supports both the ecologic function within a watershed, and a variety of human land uses, such as commercial and industrial uses. Groundwater can be used as a source of raw water for domestic supply for those who are not serviced by municipal supplies rely on groundwater to meet their water demands. Groundwater also interacts with surface water resources near rivers, lakes, or wetlands and can contribute baseflow to their water balance throughout the hydrologic year.

The value of groundwater resources can be broadly evaluated through two characteristics: groundwater quantity and groundwater quality. Groundwater quantity refers to the availability of groundwater at a given rate for production and use, and it varies widely depending upon the local

²⁷ Parkland Geotechnical Ltd. February 22, 2019. Geotechnical Investigation, Proposed Upstream Facility LSD5-3-68-W6M, M.D. of Greenview South of Grande Prairie, Alberta. The Geotechnical report was provided to support construction and the Industrial Approval application but is not provided in this Project Description.

geologic setting, hydrogeological conditions and past/current groundwater use. Groundwater quality refers to the chemical composition of groundwater and its suitability for various uses and also varies widely depending upon the local geologic setting, hydrogeological conditions, and past/current land use practices that may contribute to anthropogenic effects.

In evaluating potential effects on groundwater resources, both quantity and quality are considered.

Effects pathways describe the mechanism through which the Project can cause a potential effect on groundwater resources through physical infrastructure or associated activities. Effects pathways can change throughout the phases of the Project, depending upon the activities and physical infrastructure present.

Measurable parameters are a means through which change in groundwater quantity or quality can be characterized. The measurable parameter for a change in groundwater quantity is the hydraulic head (measured as an elevation above sea level). Hydraulic head distribution controls the movement of groundwater in the subsurface and is directly related to the availability of groundwater for use.

Changes in groundwater quality can be assessed through examination of a wide range of water quality parameter concentrations. Parameter concentrations can readily be determined from laboratory analysis of groundwater samples collected from water wells and the analysis results can be used to understand spatial and temporal variation in groundwater quality.

Interactions between the Project and groundwater quantity could include:

- groundwater withdrawals for construction dewatering
- groundwater withdrawals for Project water supply during operations
- changes in local recharge due to construction of surface infrastructure and surface water management facilities

Interactions between the Project and groundwater quality can include:

- changes to groundwater flow patterns during construction and/or operations that can in turn affect groundwater quality
- accidental groundwater contamination related to construction activities

- accidental groundwater contamination related to Project operations

7.3.5.2 Mitigation

As per commitments and requirements of the Alberta Industrial Approval, PLPLP will implement site specific emergency response plans and environmental management to ensure that the integrity of the underlying and surrounding environment is not adversely affected, and that contamination of the surrounding surface water, groundwater, soil and air will be reasonably avoided during all stages of construction and operation. Secondary containment procedures and leak detection monitoring will mitigate the potential for process liquids or wastes to be released into the subsurface, where they could migrate into groundwater. Routine maintenance inspections will be scheduled.

A spill prevention and response plan will be implemented for the Project, such that incidental spills are quickly identified, reported, and remediated.

During construction of the Project, there is potential for interactions with hydrogeology that can be mitigated through implementation of procedures and best management practices that minimize or eliminate disturbances to the local groundwater system. Standard mitigation measures for potential effects on hydrogeology during construction will include:

- Waste management procedures will be implemented for all construction wastes that are generated. Such measures would include the proper storage and segregation of wastes, such that impacts to groundwater quality are managed.
- Secondary containment will be implemented at tank locations, where required.
- Procedures to manage the risk of spills of fuels, lubricants and other construction or operations related fluids.
- Dewatering will be implemented, if required, during construction of subsurface infrastructure. The volumes of groundwater produced will be minimized through project pre-planning and careful construction scheduling such that the amount of time over which dewatering is required is minimized.
- The quality of groundwater produced would be assessed prior to discharge to the environment to confirm that the chemical composition of that water (relative to its baseline quality) has not been altered through dewatering operations. Groundwater produced during dewatering would be released as close as practicable to the dewatering location (without causing hydraulic interference) within the local watershed such that watershed scale water balances are not altered. Water will be discharged in a manner to avoid erosion using

turbidity barriers, containment berms and settling ponds. Construction dewatering, if required, will be in accordance with the terms and conditions of the EPEA approval conditions, and *Water Act* approval.

- During operations, ongoing disturbance to the groundwater will be limited to operation of any water supply wells (if required). Mitigation measure for this ongoing interaction will include monitoring of groundwater levels and water quality from the water supply well to manage drawdown effects if warranted. The monitoring program will also include ongoing tracking of water use volumes as per the terms and conditions of the Water Act diversion license.
- Where excavation is carried below the groundwater surface, a dewatering system shall be installed with sufficient capacity to maintain groundwater elevation for construction activities. Contractor will be tasked with calculating the rate and volume per day that groundwater will be pumped to the surface. Discharge from the dewatering system shall be in accordance with AEP Water Act requirements and permits.

During operations, tanks will either be stored within a secondary containment or within buildings. With secondary containment, containment areas will be lined to prevent contamination of soils or groundwater in the event of a spill or release. Tanks within buildings will be placed on concrete building foundations, which are impermeable to fluids.

Shallow groundwater monitoring will be carried out at the PLPP to allow early detection of effects from leaks or accidental spills. The monitoring program will include the installation of groundwater monitoring wells, the monitoring of the water levels in the wells and the collection of groundwater samples for chemical analysis.

The primary fluids at the PLPP that have the potential to affect the chemical quality of the shallow groundwater are process-related chemicals. As a result, the groundwater samples collected from the monitoring wells will be analyzed for the parameters listed in. At the time of sample collection, field parameters will be measured. Sampling and analytical QA/QC protocols will be followed to ensure the quality of the monitoring data.

The first set of groundwater samples will be collected at the time the monitoring wells are installed 6 months following the start of operations. Groundwater samples will then be collected on a quarterly basis during the first year of operation and on a semi-annual basis thereafter. Reporting to AEP will be on an annual basis.

The annual report will include all monitoring results for the current year and the results for all previous years. An evaluation of the water level and chemistry data for potential implications of seasonal variations will be included in the annual reports.

The approval to be issued by AEP for the Project will likely include a clause that requires the submission of proposed program including the rationale for proposed monitoring well locations, the proposed completion depths for the wells, a list of analytical parameters and a monitoring schedule. The proposed groundwater monitoring program will be developed in consultation with AEP.

Soil storage will be placed outside the operating footprint of the PLPP. Contamination protection in the form of secondary containment will be provided at tanks with toxic or environmentally harmful substances. This will be expected to prevent contamination of soils or groundwater in the event of a spill or release.

7.3.6 WILDLIFE

A desktop review was conducted to determine historic and potential wildlife species of concern occurrences in the PLPP area. Wildlife searches included both incidental observations recorded during other field survey activities, and targeted searches (primarily outside of the proposed PLPP boundary). The inspection of adjacent lands was conducted up to 1000 m from the proposed PLPP boundary.

7.3.6.1 *Habitat*

Habitat selection by wildlife is primarily a response to security, thermal comfort and forage needs. Wildlife must balance these conflicting requirements. Habitat selection is species specific and choices will depend on physiological constraints and social needs of the species.

The location will inevitably lead to further habitat loss and fragmentation however minimal. The ecological impacts will depend on the nature and extent of the existing disturbance, and the degree to which natural and semi-natural habitats are already fragmented and isolated by intervening land use. The existing disturbance around the site is related to existing seismic lines, roads, cut blocks, pipelines, and wellsite's.

Conclusions relating to affects to corridors and wildlife habitat through aerial photo interpretation, in addition to ground truthing, clearly demonstrate that some of the remaining habitat to the west of the boundaries of the PLPP will continue to provide excellent cover, browse, and travelling corridors for wildlife species.

The habitat that does presently exist appears to adequately provide the basic habitat requirements for species selection.

Observation of the vegetation, soils, and natural water bodies throughout within the PLPP lands indicates wildlife habitat of poor quality. Due to clearcutting there is no longer adequate cover for thermal and security requirements, and adequate under-story vegetation and food availability for small and large ungulates are not present. In addition, the existence of the high grade road on the west boundary of the PLPP, and oil and gas infrastructure to the south resulted in fragmentation and wildlife corridor creation.

Impacts of the PLPP include a permanent displacement of wildlife species utilizing the area. Displacement of wildlife is expected during construction and operations. Complete loss of habitat within the PLPP will occur as the location will be fenced. However, the existence of cover to the east should be expected to meet basic habitat requirements for wildlife species. Given the amount of remaining available area surrounding the PLPP, there appears to be adequate habitat to continue to support wildlife in this area.

7.3.6.1.1 Ungulates

Ungulate species expected to inhabit the vicinity of the PLPP were identified by examination of distribution maps and comparison of preferred habitat with that in the vicinity of the proposed location.

- Moose (*Alces alces*)
- Mule Deer (*Odocoileus hemionus*)
- White-tail Deer (*Odocoileus virginianus*)

7.3.6.1.2 Carnivores

Conclusions regarding carnivore species expected to inhabit the area resulted from examination of distribution maps and comparison of preferred habitat with those habitats encountered by the

Project. No tracks or signs of the species listed below were identified during the site assessment.

- American Marten (*Martes Americana*): Habitat characteristics are not found on the PLPP lands and the high level of human activity in this area suggest a low likelihood.
- Striped skunk (*Mephitis mephitis*) - found throughout the region and would be likely to occur.
- Canada Lynx (*Lynx canadensis*): Habitat characteristics are not found on the PLPP lands and the high level of human activity in this area suggest a low likelihood
- Cougar (*Felis coloris*) – As the prey requirements for the cougar appear within region, cougar is expected within the region but it is unlikely they will be found on the PLPP lands.
- Short-tailed Weasel (*Mustela erminea*) – most abundant in coniferous or mixed forests and streamside woodlands and is expected in the forest systems, but lack of cover suggests limited use on the PLPP lands.
- Black bear (*Ursus americanus*) – Based upon the vegetation characteristics in adjacent areas and the high potential for forage capabilities, in addition to prey species, black bears are expected within the area but unlikely on the PLPP lands.
- Coyote (*Canis latrans*) – found throughout the region and would be likely to occur.
- Wolf (*Canis lupus*) – mostly restricted to forest areas and likely occur within the region.
- Grizzly Bear: Habitat characteristics are not found on the PLPP lands and the high level of human activity in this area suggest a low likelihood.

7.3.6.1.3 Birds

No avian use assessments, migratory assessments or breeding bird surveys were completed for the Project. Only a single visit to determine the likelihood of nesting sites was completed. Incidental observations were limited to Common Ravens (*Corvus corax*) and Black-capped Chickadees (*Poecile atricapillus*).

Raptor species expected to inhabit the vicinity of the PLPP lands were established by examination of distribution maps and comparison of preferred habitat encountered by the location (McGillivray and Semenchuk 1998).

- Osprey (*Pandion haliaetus*)
- Bald Eagle (*Haliaeetus leucocephalus*)

- Sharp-Shinned Hawk (*Accipiter striatus*)
- Red-Tailed Hawk (*Buteo jamaicensis*)
- Golden Eagle (*Aquila chrysaetos*)
- American Kestrel (*Falco sparverius*)
- Great-Horned Owl (*Bubo virginianus*)
- Barred Owl (*Strix varia*)
- Snowy Owl (*Bubo scandiaca*)
- Great Gray Owl (*Strix nebulosa*)
- Common nighthawk (*Chordeiles minor*)

The majority of species mentioned above utilize edge habitats or open areas and are migratory. It is possible then that the creation of new edge habitat may ultimately increase hunting capabilities of raptor species as prey is exposed. The direct impact to populations of prey species is unknown.

The presence of similar habitat, nesting characteristics, and snags and deadfall concentrations remaining following construction are expected to provide the necessary forage, security, and nesting requirements for returning bird species. Therefore, the proposed development is not expected to significantly impact habitat requirements of bird species within the area.

7.3.6.1.4 Small Mammals

Small mammals expected to inhabit the vicinity of the PLPP were identified by examination of distribution maps and comparison of preferred habitat with that in the vicinity of the proposed location.

No evidence of burrows was found during the assessment. The below species may be expected in the area in unknown abundance.

- Deer mouse (*Peromyscus maniculatus*)
- Southern red-backed vole (*Clethrionomys gapperi*)
- Meadow vole (*Microtis pennsylvanicus*)
- Least chipmunk (*Tamias minimus*)
- Red squirrel (*Tamiasciurus hudsonicus*)
- Northern flying squirrel (*Glaucomys sabrinus*)
- Snowshoe hare (*Lepus americanus*)

7.3.6.2 *Effects of the PLPP*

The primary adverse impacts associated with the project is the loss of habitat associated with infrastructure. Due to existing continuous industrial activity which is already present around the PLPP and the clear-cut where the PLPP will be placed, it is highly unlikely that further significant loss of wildlife use of the PLPP lands will occur.

Factors that may contribute to effects to migratory birds may include:

- seasonal factors, such as:
 - breeding season and migration periods
 - post-breeding moult period and wintering stages for some species
- location factors, such as:
 - migration staging sites

In the case of bird collisions with structures, higher risk factors include:

- site sensitivity, such as:
 - areas of bird concentration and migratory pathways
 - surrounding landscaping and habitat type
 - meteorological conditions like fog
- structure design and size, such as:
 - lighting
 - height

In the case of effects to nests:

The presence of nests needs to consider

- the available bird habitats
- the migratory bird species likely to be encountered in such habitats
- the time periods when they would likely be present

Table 19 provides a summary of the potential environmental effects resulting from the Project-VEC interactions with birds. The table is divided according to each of the Project phases assessed (Construction, Operation and Maintenance, and Decommissioning as well as Accidents, Malfunctions, and Unplanned Events). Interaction and potential effects have been divided into

direct mortality of birds, alteration to habitat and sensory disturbance. The discussion following the table provides an analysis of key Project-VEC interactions.

Table 19. Project- VEC Interactions by Project Phase on Birds (Avifauna)

Project Activities and Physical Works	Potential Project Interactions and Environmental Effect		
	Direct Mortality	Habitat Alteration	Sensory Disturbance
Construction			
Site preparation/clearing	X	X	X
Access road construction	X	X	X
Pad levelling and grading	X	X	X
Waste management			X
Operation and Maintenance			
Project presence	X		X
Infrastructure maintenance			X
Winter maintenance			X
Vegetation management	X	X	
Decommissioning			
Infrastructure dismantling and removal			X
Pad reclamation		X	X
Accidents, Malfunctions and Unplanned Events			
Erosion and sediment control failure	X	X	
Fuel spill from machinery/trucks	X	X	
Fire	X	X	X

The impact that the PLPP may have on birds depends largely on topography design, and the bird communities in the vicinity. While birds may be affected during construction, they are most likely to interact with the Project during its operation.

Direct mortality resulting from collision with equipment is the most apparent Project interaction. Risk of collision is increased when the project is in proximity to migratory pathways, significant nesting or foraging habitat. The Project is located 4 km away from any open water that would act as resting or staging areas for migratory species.

While collision with Project exhaust stack may result in direct mortality, there is limited published data on mortality associated with stacks from power plants or towers of similar heights. Therefore, using referenced data from wind power projects causing direct mortality is an often a cited effect on birds, a study completed in 2013 found that after completing carcass searches at 43 wind farms across Canada, the average number of birds killed per turbine per year was 8.2 ± 1.4 (Zimmerling *et al.*, 2013). According to Bird Studies Canada (2017), the average mortality rates for non-raptors in Atlantic Canada is 1.81 ± 0.47 birds per turbine per year. Neither of these figures are high enough to cause a significant, permanent alteration to abundance of a bird species.

Habitat alteration may occur as a result of various Project activities. The killing of birds or the destruction of their nests, eggs, or young is an offence under the *Migratory Birds Convention Act, 1994*. Avian habitat directly within the footprint of proposed new access roads and turbine pad area construction will be eliminated. Clearing and grubbing for site preparation will remove vegetation, reducing the quantity of terrestrial habitat, and affecting the quality of already marginal habitat. The Project will result in a slight increase in edge area, which may act as a barrier for some bird species, while presenting potential benefits to others. Some bird species benefit from forest edges and have shown to return in subsequent years after an area is cleared. A study in Alberta showed that the abundance of Alder Flycatchers increased in a previously cut area (Tittler *et al.* 2001).

Very little clearing is necessary for this Project, as the main power plant location is already cleared, and the proposed route of the pipeline and transmission line will be situated adjacent to existing clearings. If a bird species utilizing habitat within the allotted areas to be cleared is unable to relocate to alternate suitable habitat, then direct mortality is a potential effect. Wildlife mortality is expected to be minimal since the cleared area required for the Project is small and because site clearing and major earthworks are scheduled to occur between September 1 and April 14, outside the migratory bird restricted activity period (RAP) for the area. If clearing were conducted between April 15 and August 31, this activity could potentially affect active migratory bird nests and recently fledged young.

Sensory disturbance may occur during construction, in particular during site preparation. Activities during the breeding season for birds has the potential to cause direct mortality, abandonment of nests, and the destruction of nest contents, all of which could include species designated as SAR or Species of Conservation Interest (SOI). If adjacent suitable habitat is not available, birds that have been displaced will not likely nest until habitat becomes available. This may result in a higher non-breeding population. A literature review conducted by Shannon *et al.* (2016) found that birds

have the potential to exhibit changes in song characteristics, reproduction, abundance, stress levels, and species richness at levels greater than 45 dBA. This noise level is not expected to be reached past the previously indicated 500m buffer around the PLPP except during construction activities during daylight hours. Avifauna may be displaced from areas adjacent to the Project as a result of construction and/or operations-related noise. This potential environmental effect would be prolonged over the lifetime of the Project.

It has been known that exterior structures such as substations, buildings and other floodlit structures can attract birds during the night and lead to mortality events. In addition, migratory birds during fall and spring are especially attracted to lighting on tall structures.

Avian habitat present within the Project Area is not unique and is extensively present within the surrounding landscape and across large tracts of undeveloped land. The Project Area is mostly comprised of hardwood, softwood or mixed forest types. Construction of Project infrastructure will impact avian habitats; however current land uses (i.e. forestry and oil and gas) have and continue to also alter the use of the Project Area by birds. It is important to note that these current land uses will continue if the proposed PLPP proceeds. While the complete cessation of all human activity on the landscape would likely have the most positive effect on avian habitat, this is unlikely to occur even if PLPP does not proceed. It is expected that any birds utilizing habitat that will be disturbed by Project activities will move to similar habitats within and adjacent to the Project Area. Given that avian habitat within the Project Area is not unique as compared to surrounding habitats, displaced bird species will find similar habitat in nearby areas.

Therefore, surface runoff collected in the storm water pond not expected to contain measurable volumes of hydrocarbons (i.e. from spills from equipment) nor will it contain any hazardous waste, which will be collected and disposed of at licensed facilities. As such, the storm water pond is not expected to adversely affect migratory birds as contact by birds is unlikely. Furthermore, the storm water pond is within the fenced and active facility and it is further unlikely to receive waterfowl use. If use does occur, the PLPP will implement bird deterrents to prevent further use. Deterrents will be designed following literature reviews on acceptable measures and consultation with Alberta Environment and / or CWS as appropriate.

Decommissioning of the PLPP will result in a positive effect on the Project, involving the reclamation of land and re-establishment of vegetation and habitat for birds across the Project Area.

Overall, the likelihood of effects on wildlife and birds specifically, would be expected to be unlikely.

7.3.6.2.1 Effects to Habitat from Acid Deposition

The predominant chemicals associated with acidic precipitation are sulfuric and nitric acid (H₂SO₄ and HNO₃). These strong mineral acids are formed from sulfur dioxide (SO₂) and nitrogen oxides (NO_x) in the atmosphere.

Sulfur compounds are emitted from anthropogenic sources in the form of SO₂ and, to a lesser extent, primary sulfates, principally from coal and residual-oil combustion and a few industrial processes (National Acid Precipitation Assessment Program, 1991).

The principal anthropogenic source of NO_x emissions is fuel combustion (U.S. Environmental Protection Agency (EPA), 2003a). Such combustion occurs in internal combustion engines, residential and commercial furnaces, industrial boilers, electric utility boilers, engines, and other miscellaneous sources. Because a large portion of anthropogenic NO_x emissions come from transportation sources (*i.e.*, non-point source pollution), NO_x sources are on average more dispersed than SO₂ sources (National Acid Precipitation Assessment Program, 1991).

In the atmosphere, SO₂ and NO_x are converted to sulfates and nitrates, transported over long distances, and deposited over large areas downwind of urban areas or point sources. (Industrial Economics, Incorporated, 2011)

Acidification of ecosystems has been shown to cause direct toxic effects on sensitive organisms as well as long-term changes in ecosystem structure and function. The effects of acidification can be seen at all levels of biological organization in both terrestrial and aquatic ecosystems. Adverse effects in terrestrial ecosystems include acutely toxic impacts of acids on terrestrial plants and, more commonly, chronic acidification of terrestrial ecosystems leading to nutrient deficiencies in soils, aluminum mobilization, and decreased health and biological productivity of forests (Industrial Economics, Incorporated, 2011). In aquatic ecosystems, acidification-induced effects are mediated by changes in water chemistry including reductions in Acid Neutralizing Capacity (ANC) and increased availability of aluminum (Al³⁺), which in turn can cause increased mortality in sensitive species, changes in community composition, and changes in nutrient cycling and energy flows (Industrial Economics, Incorporated, 2011).

Acid-sensitive ecosystems include those with high acidic deposition and low acid neutralizing capacity. Many of these ecosystems occur downwind of emission sources, often in mountainous areas where soils are thin and poorly buffered. High elevation sites are also more vulnerable because mountain fog is often more acidic than rain (Industrial Economics, Incorporated, 2011).

Factors that may be involved in determining the extent and timing of recovery may include mobilization of stored sulfate and nitrate from soils and reduced base cation concentrations in surface waters (Eshleman, Morgan II, Castro, & Neglely, 2008).

Biological communities also show mixed responses to reductions in acid deposition. In lakes recovering from acid deposition, biological communities do not appear to closely track stream chemistry (Burns, Riva-Murray, Bode, & Passy, 2008).

Because recovery from acidification is a complex process, the timing and extent of recovery expected under reduced acidic deposition is difficult to predict (Industrial Economics, Incorporated, 2011). Recovery models based on regression of pH and various biological parameters indicate that pH 5.5-6 is an important threshold below which the biota are at risk (Doka *et al.* 2003). A variety of analyses also indicate the lack of a uniform model with which to describe or predict aquatic system recovery (U.S. Environmental Protection Agency (EPA), 2003a) (Eshleman, Morgan II, Castro, & Neglely, 2008). At present it is clear that recovery does not closely track changes in acidic deposition, and that there is likely a lag between reduced acidity and recovery of biological communities (Industrial Economics, Incorporated, 2011).

Importantly, an emerging body of literature is focused on the complicated relationship between acidic deposition and nitrogen deposition. While acidic deposition impedes plant growth, in nitrogen limited systems, moderate levels of nitrogen can act as a fertilizer, potentially offsetting to some extent the impacts of acidification on biological production.

7.3.6.3 Mitigation

The timing and methods of construction and reclamation will be adjusted as needed to meet impact mitigation requirements specified by timing requirements for species in the vicinity.

The PLPP will be fenced prior to operations. This is expected to prevent wildlife intrusion into the PLPP area.

The PLPP will follow the approval conditions provided in the LAT report issued by AEP. The conditions include:

- PLPLP must conduct a complete and immediate Wildlife Sweep of the Lands (plus 100 metre buffer) prior to any activity.
 - Nest surveys would be completed once a detailed construction schedule is known and would be completed less than 3 days prior to construction beginning in areas.
 - Nest searches conducted no more than 7 days prior to work commencement and be re-done if work stops for more than a 7 day period.
- Submit results from a Wildlife Sweep to the Fisheries and Wildlife Management Information System (FWMIS) and notify the issuing Regulatory Body in writing upon request that the Wildlife Sweep was completed.
- PLPLP must incorporate a buffer zone of a minimum width of 100 m of undisturbed vegetation, where an established buffer does not already exist (e.g. Species at Risk) for any and all key habitat features including, but not limited to nests, dens and houses identified in the Wildlife Sweep.
- The search area must cover the entire area of the proposed disturbance, plus 100 m.
- If an active nest is found within the disturbance footprint or 100-m setback, work shall not initiate until the nest has fledged and/or is no longer active.
- If a ground nest is found during these surveys, the area will be marked by GPS and ground stakes put in at a 100 metre setback to avoid disturbance to any nest. If a ground nest is found, then construction activities will be moved to other lands within the Project. This would not affect the overall project construction schedule but will require a change in the location of construction within the Project.
- The nest will be monitored and upon nest abandonment following chick rearing, construction will begin in these areas.
- Removal of nests is governed by the *Alberta Wildlife Act (AWA)*, specifically *Section 36(1)*, A person shall not willfully molest, disturb or destroy a house, nest or den of prescribed wildlife in prescribed areas and at prescribed times. Prescribed wildlife is then in the regulations.
- The existing *Migratory Birds Convention Act, 1994 (MBCA)* prevents the removal of nests for migratory bird species. The proposed updated Regulations (2019) contain a potentially helpful clarification that the prohibition to nests and their removal will not apply to unoccupied nests. Determining if a nest is unoccupied will require that a nest not contain a

live bird or viable egg. There are exceptions for nests of 16 species of birds, such as herons, which are listed in the schedule 1 to the Regulations.

- Therefore, once the nest is unoccupied, it can potentially be removed without violation of the above noted Acts or regulations.
- Strip soils and vegetation at areas that require permanent clearing as soon as possible within the activity period. This would reduce the likelihood of ground nesting birds beginning nesting.

PLPLP is committed to the development of an Environmental Protection Plan (EPP) which among other commitments will specify best management practices associated with birds utilizing the Project Area, mitigation methods and contingency plans associated with vegetation removal, operations, progressive reclamation and re-vegetation of the Project Area. The Project EPP will include methods by which the Project can take place while minimizing interactions with avifauna, these include:

- Conduct mortality monitoring that includes episodic surveys;
- Should post-construction monitoring identify significant mortality events are occurring at PLPLP to a particular species of bird, at a particular time of the year, or during specific weather conditions, PLPLP will consult with Alberta Environment and/or CWS to determine appropriate mitigation to minimize future interactions and effects;
- Discourage ground-nesting species by limiting large piles or patches of bare soil during the breeding season, where practicable;
- Should any ground- or burrow-nesting species initiate breeding activities within stockpiles or exposed areas, PLPLP will avoid disturbance to these areas until chicks can fly and the nesting areas are no longer being utilized;
- Grubbings and topsoil will be salvaged and stored for use in site restoration;
- Implement an erosion and sediment control plan;
- Regularly inspect and repair erosion and sediment control devices;
- Implement reclamation program to re-establish similar habitat to support reintroduction of birds post turbine life.
- PLPLP will implement the following lighting procedures to minimize the potential hazards to birds:

- Perform lighting studies to meet the recommended illumination levels per Table-3 of API-RP 540 (Electrical Installations in petroleum processing plants). The studies are completed using Dialux software for both indoor and outdoor environments;
- All outdoor lighting fixtures are LED fixtures strategically placed onsite, photocell controlled and dark sky friendly²⁸ with 100% light cut-off;
- PLPLP can provide the lighting study report showing fixture mounting orientation, height & layout, work-plane height, illumination values in foot candles (for the given area) and bill of materials of fixtures used;
- Install downward-facing lights on ground level site infrastructure to reduce attraction to birds;
- Use movement detection lighting on office structures, doors to facilities, gates, etc. which turn off when not in use, instead of permanent lighting; and,
- Installation of lighting on tall structures to meet Transport Canada guidelines

Should site activities during active nesting periods be unavoidable, additional mitigative measures such as pre-disturbance nest searches and avoidance and setbacks from active nests will be applied.

The potential effects associated with increased traffic on wildlife would be uncertain. However, data for wildlife collisions is collected by the Alberta Wildlife Watch Program²⁹. This program collects and analyzes data on animal-vehicle collisions throughout Alberta to:

- reduce animal-vehicle collisions (AVCs) on provincial highways
- improve driver safety
- minimize the impacts of highways on wildlife populations

The program identifies AVC-prone locations to:

- provides high-quality data for effective decision-making

²⁸ A dark-sky-compliant solution can be achieved with compliant fixtures (proper color temperature, optic type etc) and design.

²⁹ <https://www.alberta.ca/alberta-wildlife-watch-program.aspx>

- informs the development of Alberta Transportation policies and standards
- allow for innovation
- evaluate the effectiveness of long-term mitigation activities

7.3.7 SURFACE HYDROLOGY

Using the Alberta merged wetland inventory anticipated watercourse and wetland locations were identified by initial desktop analysis. Field confirmation and/or delineation was based on micro-topography and observed surface hydrology and vegetation.

7.3.7.1 *Surface Runoff*

Surface runoff will be managed as per the requirements of the Alberta Industrial Approval. No wastewater, sludge or surface runoff will be released directly to watercourses or wetlands as a result of operations.

An industrial runoff plan has been designed as a component of the operational requirements for the PLPP. Any pump off of industrial runoff will likely be directed towards the north side of the PLPP into surrounding natural vegetation and will drain north through natural topography. All water will be discharged without causing erosion (erosion control will be provided at the discharge point). The water will be discharged to a well vegetated area where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release.

7.3.7.2 *Watercourses*

No mapped watercourses are present within or adjacent to the PLPP. Historical review of aerial photos between 2006 and 2017 did not reveal the presence of watercourses across the PLPP project lands. Field assessment confirmed there are no watercourses within or adjacent to the PLPP lands.

The closest watercourse is located approximately 650 metres north of the Project lands, with no direct connection to PLPP lands. Big Mountain creek is located approximately 900 metres west of the PLPP. The Smoky River is located greater than 4 km from the PLPP. Please refer to Figure 16. Wetlands and Watercourses.

7.3.7.3 Wetlands

No provincially mapped wetlands are present. Historical review of aerial photos between 2006 and 2017 did not reveal the presence of wetlands. Field assessment confirmed there are no wetlands within or adjacent to the PLPP lands. The closest wetland is located approximately 400 metres north of the PLPP. The PLPP is not located within a 1 in 100 year floodplain and there was no evidence of natural springs on the lands. Please refer to Figure 16. Wetlands and Watercourses.

7.3.7.4 Effects of the Project

7.3.7.4.1 Effects to Smoky River

No water withdrawal or crossing of the Smoky River is required for the PLPP. As the river is 4km from the PLPP, no effects will occur.

7.3.7.4.2 Effects to Big Mountain Creek

There is no surface water course connection from the PLPP to Big Mountain Creek. No water withdrawal or crossing of Big Mountain Creek will be required for the PLPP or for the associated transmission line. As Big Mountain Creek is approximately 900 metres away, no effects to the creek will occur.

7.3.7.4.3 Effects to nearby watercourses

No watercourses are within 650 m of the PLPP. Surface runoff will be discharged following sampling and testing and therefore managed as per the requirements of the Alberta Industrial Approval and in accordance with Alberta regulatory requirements. If surface runoff water is not suitable for discharge due to exceedances of some parameter, the water will be hauled for industrial disposal. No direct discharge to watercourses will occur and no overland flow of released water will be able to reach the closest watercourse. Nevertheless, surface water discharge will be monitored to ensure no effects from the discharge to surface vegetation or soils (i.e. resulting from erosion), occurs.

7.3.7.4.4 Effects to potable water sources

Currently the Alberta Water Well Database does not identify any licenced potable water wells within 3 km of the PLPP. Additionally, the PLPP will implement a groundwater monitoring program (identified in Section 7.3.5.2), with the intent of the monitoring program to be the identification of potential impacts to groundwater that could then affect drinking water sources. If affects are identified, mitigation or remediation would be proposed to mitigate further effects.

These two factors suggest there would be no effects to potable water sources around the PLPP.

7.3.8 TABLE OF EFFECTS

The scope, methodology and baseline environmental conditions for the PLPP have been described in detail in this document. Each VEC, as identified and defined, has been described and baseline environmental work has been completed to evaluate each VEC based on the site-specific conditions relating to the PLPP.

Based on the environmental baseline work completed for each VEC over the course of one year, and the expertise of the various members of the Environmental Assessment Project Team, evaluation of each VEC has been completed to determine which VEC could have potential residual effects once planned mitigation has been completed. This evaluation is described in Table 20 (below).

Table 20. Valued Ecosystem Component Effects Table

VEC Category	VEC	Description of Impacts	Mitigation	Residual Effects
Habitat	Forested Habitat	Loss of vegetation Soil disturbance Loss of habitat	<ul style="list-style-type: none"> • Use of cutblock for project location. • Completion of assessments for vegetation and wildlife use prior to construction 	None expected following reclamation of the Project.
Soils	All soil types	Impacts associated with construction include potential reduction in soil characteristics (quality and quantity) due to handling, admixing and losses due to erosion.	Mitigation for soils has been outlined in the Industrial approval application.	Following interim reclamation replacement and revegetation of soils following construction (outside operational areas), residual effects are short term and not expected to extend beyond construction.
Hydrology	Groundwater	Potential effects to quality and quantity	<ul style="list-style-type: none"> • Waste management procedures will be implemented for all construction wastes that are generated. • Procedures and secondary containment will be 	Effects to quality not expected as secondary containment and spill response procedures will be implemented. Alberta

VEC Category	VEC	Description of Impacts	Mitigation	Residual Effects
			<p>implemented, where required, to manage the risk of spills of fuels, lubricants and other construction related fluids.</p> <ul style="list-style-type: none"> • Dewatering will be implemented, if required, during construction of subsurface infrastructure. The volumes of groundwater produced will be minimized through project pre-planning and careful construction scheduling such that the amount of time over which dewatering is required is minimized. • A groundwater monitoring network and a groundwater monitoring program may be implemented in accordance with the terms and conditions of the EPEA approval if required. Secondary containment procedures and leak detection monitoring will mitigate the potential for 	<p>Environment may request groundwater monitoring during operations to ensure no effects. Effects to quantity will be limited in duration and recharge of groundwater following dewatering not expected to result in residual effects.</p>

VEC Category	VEC	Description of Impacts	Mitigation	Residual Effects
			<p>process liquids or wastes to be released into the subsurface.</p> <ul style="list-style-type: none"> A spill prevention and response plan will be implemented for the Project, such that incidental spills are quickly identified, reported, and remediated. 	
	Surface Runoff	Movement of sediment and potential surface contaminants into surface water collection pond.	<p>An industrial runoff plan has been designed as a component of the operational requirements for the PLPP. Any pump off of industrial runoff will likely be directed towards the north side of the PLPP into surrounding natural vegetation and will drain north through natural topography. All water will be discharged without causing erosion (erosion control will be provided at the discharge point). The water will be discharged to a well vegetated area where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release. Any runoff that does not meet criteria (as indicated in report) will be disposed at an approved facility.</p>	None

VEC Category	VEC	Description of Impacts	Mitigation	Residual Effects
Wildlife	Birds Ungulates Mammals	<p>Potential concerns associated with birds include:</p> <ul style="list-style-type: none"> • Habitat alteration; • Sensory disturbance; • Potential for vehicle collisions with wildlife • Potential for bird mortality from transmission line. 	<ul style="list-style-type: none"> • Pre-construction wildlife sweeps as per regulatory requirements. • Use of cutblock for project location. • Project located in proximity to highway, high grade road, and oil and gas development expected to limit further effects. • Fencing of PLPP to prevent wildlife access • Vehicle collisions may be avoidable if all posted speed limits are followed however no specific mitigation available. • Line markers to be installed on sections of the transmission line within 500 metres of Trumpeter Swan lakes as per Alberta Environment requirement. 	<p>Residual effects of vehicle collisions would be limited due to limited occurrences.</p> <p>Residual effects of bird mortality would likely be limited.</p> <p>None expected following reclamation of the Project.</p>
Vegetation	Rare Plants	Impacts to rare plants not expected as none identified	<ul style="list-style-type: none"> • Use of cutblock with no unique habitat. 	None

VEC Category	VEC	Description of Impacts	Mitigation	Residual Effects
			<ul style="list-style-type: none"> • Weed control will be implemented 	
Watercourses	Watercourse	None as no watercourses affected.	N/A	None
Wetlands	All Classes, All Types	None as no wetlands affected.	N/A	None

7.4 CHANGES THAT MAY BE CAUSED BY THE PROJECT TO FISH AND FISH HABITAT, LISTED AQUATIC SPECIES AND MIGRATORY BIRDS

7.4.1 FISH AND FISH HABITAT

7.4.1.1 *Power Plant*

As a result of the Summary of Issues, PLPLP has reviewed the potential water sources for the raw source water. As the IAA is aware, the initial proposal included trucking water into the site from a pre-existing water source sump used for well fracking / drilling currently owned and operated by HHR. An AEP Water Act license would have been required to receive source freshwater from the HHR point of water diversion on the Smoky River at NE 31-067-04W6M, with a point of use/storage for the PLPP from the HHR water storage reservoir location SW 35-067-04W6M. The source location of the diversion on the Smoky River is already approved and in operation by HHR. Even though no new infrastructure would be required at the Smoky River, PLPLP has now eliminated this as a water source option for the PLPP. Going forward, the PLPP will source water from existing industrial water sources in proximity to the Project, under existing water licences. No water sources will include water withdrawal from any fish bearing watercourses, including the Smoky River. Therefore, there is no infrastructure required within or adjacent to the Smoky River, and no interaction between the PLPP and the Smoky River or any tributaries.

No activities for the PLPP are planned in or near the Smoky River or Big Mountain Creek. According to 2019 Alberta Guide to Sport fishing, Zone 1 Eastern Slopes – ES4³⁰, Big Mountain Creek may contain Bull Trout (*Salvelinus confluentus*), other trout species, and Mountain Whitefish (*Prosopium williamsoni*). All surface water from the PLPP area will be collected in the storm water pond. If the pond and ditches are full, excess water from the pond will be released to the adjoining upland areas, only if the water meets release standards. Water release will be to upland areas that do not drain directly into any watercourse. Therefore, no direct inputs into Big Mountain Creek, located approximately 900 meters west, would occur. Water that does not meet provincial standards for overland release will be pumped into a truck for disposal at an approved disposal site. The PLPP will not have other indirect interaction with fish or fish habitat.

³⁰ <https://albertaregulations.ca/fishingregs/es4.html>

7.4.1.2 Pipeline

There are no watercourse crossings or fish bearing streams within 1000 metres of the pipeline and therefore there will be no effects to fish or fish habitat during construction or operations.

7.4.1.3 Transmission Line

Project components include clearing and access, foundations and anchors, tower assembly, tower erection, stringing, and reclamation. Based on the proposed construction activities for each Project component, potential Project-related interactions associated with any watercourse crossings by the overhead lines and interactions with potential fish habitat is limited to clearing up to 30 metres to the banks (no interactions are anticipated with foundations, tower erection, stringing, etc.).

To optimize access and limit the incremental Project footprint, existing access will be utilized where possible. Due to existing access on both sides of the watercourses, no watercourse crossings will occur by equipment during construction or operations.

All access follows the most direct route deviating only to accommodate topography constraints and avoid environmental features. Field reconnaissance of all access and watercourse crossing locations was completed in the summer of 2019. One of the goals on the reconnaissance work was to identify unnecessary watercourse crossings and eliminate them from the access plan.

Therefore, there are no interactions of the transmission line with fish or fish habitat.

7.4.2 MARINE PLANTS

The PLPP is over 1000 km from any marine environment and no potential effects to marine environments or aquatic species will occur as a result of the PLPP.

7.4.3 MIGRATORY BIRDS

The PLPP lands have limited potential to support tree nesting migratory birds as the project was recently clear-cut. There is potential to affect migratory birds including species at risk during construction and operation of the proposed Project.

Specifically, removal of vegetation from the Project footprint (20.6 ha) and ground disturbance have potential to result in the direct loss of migratory bird habitat as well as result in indirect habitat loss associated with sensory disturbance from operations. Potential sensory disturbance (e.g., noise, light) has the potential to continue during operations; however, mortality risk associated with potential equipment collisions during construction and operations is unlikely given displacement due to noise and loss of habitat within the constructed and operational areas.

Potential changes to the atmospheric environment associated with fugitive dust as well as vehicle and equipment emissions may temporarily reduce habitat availability (e.g., food resources, nesting sites) for migratory birds during construction; however, these effects could be potentially confounded with indirect effects associated with sensory disturbance (i.e., overlap with avoidance).

The construction of the Project will result in the loss of 9.93 ha of habitat in the fenced area for the duration of the Project. The laydown area will be reclaimed to equivalent habitat following construction. The final operational area is expected to result in a loss of 6 ha. The fenced area and access road will be reclaimed to equivalent habitat following decommissioning of the Project.

The Project footprint will include a storm water pond to hold any surface run-off prior to release. This area may be used by migratory birds in a similar fashion to use of wetlands in the region but would be considered unlikely given the proximity to operational equipment. Potential indirect interaction may occur through runoff from the site and spills which might affect the quality of the storm water pond. However, PLPLP has a spill response plan in place which will limit, if not wholly eliminate, the potential for contaminants into the pond.

Therefore, surface runoff collected in the storm water pond not expected to contain measurable volumes of hydrocarbons (i.e. from spills from equipment) nor will it contain any hazardous waste, which will be collected and disposed of at licensed facilities. As such, the storm water pond is not expected to adversely affect migratory birds as contact by birds is unlikely. Furthermore, the storm water pond is within the fenced and active facility and it is further unlikely to receive waterfowl use. If use does occur, the PLPP will implement bird deterrents to prevent further use. Deterrents will be designed following literature reviews on acceptable measures and consultation with Alberta Environment and / or CWS as appropriate.

With respect to the transmission line, line markers to be installed on sections of the transmission line within 500 metres of Trumpeter Swan lakes as per Alberta Environment requirements. This will limit effects to Trumpeter Swans, and other species using similar habitat. Residual effects of bird mortality from transmission line would likely be limited as there is an existing transmission line adjacent to proposed route.

7.5 CHANGES THAT MAY BE CAUSED BY THE PROJECT TO FEDERAL LANDS OR LANDS OUTSIDE OF ALBERTA

The closest federal land is Jasper National Park, located approximately 130 km south of the Project. Refer to Figure 14. Parks and Recreational Areas.

The closest Indigenous Group reserve lands are the Sturgeon Lake IR #154B, located 69 km east/northeast and the Horse Lake IR #152B, located 84 km northwest of the PLPP.

The PLPP is approximately 84 km from the Alberta – British Columbia border, which is the closest provincial border to the PLPP.

The PLPP will have localized effects, and negligible to no effects on aquatic resources. Additionally, the air emissions of the PLPP will be continuously monitored to be in compliance with Alberta and Federal regulatory requirements. Therefore, the Project is not anticipated to have any adverse environmental effects outside of Alberta.

7.6 CHANGES THAT MAY BE CAUSED BY THE PROJECT TO INDIGENOUS PEOPLES RESULTING FROM CHANGES TO THE ENVIRONMENT

Changes to the environment, including air quality, noise, soil, vegetation, wildlife, and heritage resources are expected to be localized in or near the Project Area.

Regarding health and socio-economics, no ingestion or inhalation pathways that could trigger the need for a human health risk assessment are anticipated. The emissions from the PLPP during operations will be compliant with provincial and federal requirements. The existing oil and gas activity and forestry harvesting in the immediate area likely preclude indigenous use of the PLPP and immediately adjacent and surrounding areas. Given this, effects on human health are not anticipated.

The environmental effects of the construction and operation of the PLPP are expected to be minimal, therefore impacts to Indigenous peoples are also expected to be minimal.

Engagement with Indigenous peoples has revealed limited to no use of the PLPP lands or immediately surrounding area.

7.6.1 USE OF LANDS

7.6.1.1 *Hunting*

Current land use in and immediately adjacent to the PLPP is heavy industrial (i.e. oil and gas, logging, transmission lines) which also suggests limited use and effects on current land use by Indigenous persons. For example, the proximity to Highway 40, west of the PLPP, the existing high grade road, existing oil and gas infrastructure south of the PLPP, and the active logging and CANFOR road likely create an exclusion zone for hunting due to potential safety concerns. Nevertheless, the PLPP is located within the Alberta Wildlife Management Unit 356, which allows hunting for bear, moose, elk, deer and game birds. This would suggest the broader area could be used for hunting by Indigenous persons.

The gas pipeline and electrical transmission line may encounter traditional use areas associated with hunting however during construction only the over story vegetation is removed and work in and around watercourses and wetlands will be conducted to minimize environmental impacts using detailed mitigation strategies and Best Management Practices (BMP). Following construction of the gas and transmission lines, operational activities are minimal, thus there would be limited effects to use at that time. The presence of the existing transmission line adjacent to the proposed routes may have already impacted use, and further development would not be expected to necessarily affect these areas further. Finally, during permitting of the gas pipeline and transmission line, further consultation with Indigenous groups will occur and areas of traditional use would hopefully be identified at that time, if they exist.

Engagement with Indigenous groups has not identified any areas of known hunting in the immediate vicinity of the PLPP that would be affected by the PLPP.

7.6.1.2 *Plant Gathering*

The collection of traditional use plants is likely limited due to the existing heavy industrial use around the PLPP, the lack of wetlands or watercourses within or adjacent to the PLPP boundaries, and the recent clear-cut of the PLPP lands. The vegetation assessment at the PLPP did not identify any uncommon or species at risk, suggesting that the species identified at the PLPP are common to the area. Engagement with Indigenous groups has not identified any areas of known plant gathering that would be affected by the PLPP.

The gas pipeline and electrical transmission line may encounter traditional use areas associated with traditional use of plants, however during construction only the over story vegetation is removed and work in and around watercourses and wetlands will be conducted to minimize

environmental impacts using detailed mitigation strategies and Best Management Practices (BMP). Following construction of the gas and transmission lines, operational activities are minimal, thus there would be limited effects to use at that time. The presence of the existing transmission line adjacent to the proposed routes may have already impacted use, and further development would not be expected to necessarily affect these areas further. Finally, during permitting of the gas pipeline and transmission line, further consultation with Indigenous groups will occur and areas of traditional use would hopefully be identified at that time, if they exist.

7.6.1.3 Fishing

The PLPP and associated infrastructure will not have any effect on fish or fish habitat. Therefore, continued use of fisheries resources by Indigenous groups would not be affected.

7.6.1.4 Trapping

During consultation associated with the PLPP, registered trappers were notified. No concerns from active trappers were raised. No active trap lines are present at the PLPP. During permitting for the transmission line and gas pipeline, further consultation with trapper(s) will occur. Any concerns will be discussed with affected person(s) and mitigation employed following consultation.

Engagement with Indigenous groups has not identified any areas of known trap lines or trapping more generally, that would be affected by the PLPP.

7.6.1.5 Use of Navigable Waters

The PLPP and associated infrastructure will not have any effect on navigable waters. Therefore, continued use of navigable waters by Indigenous groups would not be affected.

7.6.1.6 Recreational Use

The PLPP and associated infrastructure will not have any effect on recreational use of the lands. The limited footprint of the PLPP is such that recreational activity is limited due to proximity to existing infrastructure (i.e. oil and gas) and safety concerns therein. Therefore, recreational use by Indigenous groups would not be significantly affected. Engagement with Indigenous groups has not identified any areas of known recreational use that would be affected by the PLPP.

7.6.1.7 Commercial Use of the Lands by Indigenous Groups

There is no known commercial use of the PLPP lands by Indigenous Groups. Commercial forestry has previously harvested commercial timber from the lands. No commercial outfitting

is known to occur on the lands. Engagement with Indigenous groups has not identified any areas of known commercial use that would be affected by the PLPP.

7.7 HISTORICAL RESOURCES

Currently, there are no identified sites or structures of historical, archaeological, paleontological, or architectural significance in the PLPP area.

The identification of sites and potential risk to historical resources is first searched through the “Alberta Listing of Historic Resources” (the ‘Listing’). The Listing is a tool that developers, industry representatives, and regulators may use to help determine if a proposed development might affect historic resources, including:

- archaeological sites
- palaeontological sites
- Indigenous traditional use sites of a historic resource nature (burials, ceremonial sites, etc.)
- historic structures

The HRV listing provides proponents with advance notification of possible historic resource concerns and may be used as a tool for project planning. Used in conjunction with the Instructions for Use of the Listing and/or a relevant Land Use Procedures Bulletin, the Listing helps to determine if a proposed development needs approval under the Culture, Multiculturalism and Status of Women’s (CMSW) Historic Resources Management Branch’s (HRMB) *Historical Resources Act* approval process. The Listing indicates the Historic Resource Value (HRV), if any, that has been assigned to lands in the project area, and the Instructions for Use and the procedures bulletins explain the required action. In many cases, the required action is to submit a Historic Resources Application through the Online Permitting and Clearance (OPaC) system.”³¹

In addition, the ACO’s consultation requirements are independent of CMSW’s, HRMB *Historical Resources Act* approval process. If a project area includes HRV 4c site(s), the ACO will inform proponents and direct them to contact CMSW.

³¹ Listing of Historic Resources. 2019. <https://www.alberta.ca/listing-historic-resources.aspx>

Although no listings are present on the PLPP lands, as per AUC requirements, an application through OPaC was submitted to the Historical Resources Branch for review.

If undocumented historical resources are discovered during construction, salvage operations will be completed according to regulatory guidelines, which include the *Historical Resources Act*, the *Guidelines for Archaeological Permit Holders in Alberta* and the *Archaeological and Palaeontological Research Permit Regulation* (Alberta Regulation 254/2002).

Furthermore, the PLPP has engaged with Indigenous Groups and will continue engagement through the life of the project. PLPLP will request that if any Indigenous Groups request to hold a pre-construction ceremony at the PLPP, that they assess the area for potential historical resources, sacred sites, or culturally important resources. If they deem there is potential, PLPLP will consult with the Indigenous group and the HRMB and obtain the services of an archaeologist to determine next steps. If undocumented historical resources are discovered or identified during construction, PLPLP will contact the HRMB and if appropriate, the CMSW and obtain the services of an archaeologist to determine next steps. In addition, PLPLP will notify all of the Indigenous Groups so they may monitor the process should they so choose.

7.8 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

7.8.1 SEISMIC ACTIVITY

Ground motion predictions equations and probabilistic models are utilized to predict levels of ground motion and its associated uncertainty at any given site or location which Appendix C in the Alberta building code provides the recommended seismic design values for a particular location.

The seismic hazard values were updated with seismic events that have been measured and recorded from the Geological Survey of Canada of Natural Resources Canada which was utilized for the updated hazard values from the Alberta building code 2014 to 2019. This would include induced seismic events recorded from seismometer stations.

Seismic design at the PLPP will follow the Alberta Building Code (2019).

7.8.2 CLIMATE CHANGE

The effects of climate change create changing patterns throughout a wide range of climate indices including:

- Temperature:

- Mean temperature by season
- Ranges
- Days of first and last frost
- Days with temperatures $>30^{\circ}\text{C}$
- Days with temperatures $<30^{\circ}\text{C}$
- Freeze Thaw days
- Growing Temperatures:
 - Growing season lengths;
 - Growing days above and below certain temperatures;
 - Start and End days to growing seasons
- Precipitation:
 - annual; winter; spring; summer; fall;
 - Days with $>10\text{mm}$
 - Days $>20\text{mm}$
 - Length of dry periods
 - Snow water equivalents
 - Snowfall proportions
 - Annual Potential Evapotranspiration

Effects to the PLPP considering these above factors can now be estimated using the recently released Alberta Climate Records website³². This will allow the PLPP to reasonably estimate the potential effects of climate change using the above noted parameters by using projected climate outcomes to predict operational restrictions and / or potential operational benefits that may occur. For example, increased precipitation may impact surface runoff, resulting in an operational restriction, whereas an increase in mean winter operational temperatures may result in an operational benefit for equipment efficiencies. PLPLP will continue to assess climate change as the PLPP will be required to adapt accordingly.

³² Alberta Climate Records. 2020. University of Lethbridge. <http://albertaclimaterecords.com/#>

Changing precipitation volumes is currently accounted for in the surface runoff pond design. The peak flow rates design calculations determined a runoff pond storage capacity of 1425.6 m³ was required to contain surface water runoff. However, the runoff pond is designed for approximately 1500m³ of water storage to accommodate potential increased precipitation.

8 ENGAGEMENT WITH INDIGENOUS GROUPS

PLPLP is committed to continuous, open and transparent dialogue with communities and other stakeholders. Engagement will continue through the application, approvals, construction, operation and reclamation processes. The intent of this approach is to provide a foundation for effective community relations over the life of the PLPP.

PLPLP understands that each group is unique and may have evolving requirements and processes for engagement, therefore PLPLP will continually adapt and tailor the engagement to meet community requirements and sensitivities.

8.1 ABORIGINAL CONSULTATION OFFICE REQUIREMENTS

PLPLP submitted a pre-consultation request to the Aboriginal Consultation Office (ACO) for a miscellaneous lease (DML) on crown land. It was determined that Level 1-Streamlined consultation was required, which allows notified Indigenous Peoples up to 15 Government of Alberta working days to respond to the project notification. If any Indigenous Peoples respond to the notification, consultation should be complete within 15 working days of response to notification. If the 15-day notification period has expired and the Indigenous Group has not responded to the project notification within that time, PLPLP, after providing Indigenous Peoples with 5 working days to review the consultation record, may ask the ACO to review the consultation record for adequacy.

8.1.1 LIST OF POTENTIALLY AFFECTED AND INTERESTED INDIGENOUS GROUPS

In accordance with Alberta's Indigenous Peoples and Métis Settlements policies and guidelines (<http://indigenous.alberta.ca/1.cfm>), the ACO indicated that the PLPLP is located within the traditional territories of the:

1. Gift Lake Métis Settlement;
2. Horse Lake First Nation; and,
3. Sucker Creek First Nation.

8.1.2 ACO ADEQUACY ASSESSMENT DECISION

Once the ACO has deemed consultation adequate, the proponent may proceed with the appropriate regulatory application process.

On March 18, 2019, PLPLP received the adequacy decision which stated the consultation with the above noted Indigenous groups was deemed adequate.

8.2 IMPACT ASSESSMENT AGENCY OF CANADA REQUIREMENTS

On September 19, 2019 an initial list of Indigenous groups that the Agency would consult was provided. The list of groups included the following:

Treaty 8 Indigenous Peoples

- Duncan's First Nation
- Driftpile First Nation
- Horse Lake First Nation
- Kapawe'no First Nation
- Sawridge First Nation
- Sturgeon Lake Cree Nation
- Sucker Creek First Nation
- Swan River First Nation

Metis

- East Prairie Metis Settlement
- Métis Nation of Alberta (in Region 6; near Region 4)
- Kelly Lake Metis Settlement Society / Metis Community Society of Kelly Lake
- Kelly Lake Leadership Group

Non-Treaty Indigenous Groups

- Aseniwuche Winewak Nation

- Foothills Ojibway First Nation
- Kelly Lake Cree Nation
- Kelly Lake First Nation
- Foot Hills First Nation

8.3 DESCRIPTION OF ENGAGEMENT ACTIVITIES CARRIED OUT TO DATE

The Proponent sent information packages to the three identified Indigenous groups provided by the ACO. PLPLP submitted their records of consultation to the ACO and received an Adequacy Assessment deeming consultation complete on April 18, 2019. A copy of the Adequacy Assessment provided in Appendix G. Gift Lake Metis, Horse Lake, and Sucker Creek representatives reviewed and visited the Project location.

In October 2019, PLPLP sent information packages (the ‘package’) to the 15 Indigenous groups indicated by the IAAC. The consultation package included a cover letter, survey plan which shows the location of the PLPP, and this Project Description Summary document (less this section).

Further consultation activities to-date include:

- making contact with groups to confirm interest, identify key individuals and community representatives and to seek out and define preferred communication mechanisms or courses of action;
- establishing or enhancing forums such as telephone communication, email, requesting one-on-one and/or group meetings, open houses and/or workshops to share information with stakeholders and to obtain input on issues, questions or positions and;
- disseminating information and updates through communication mechanisms including the Project Summary Document, bulletins, advertisements, open houses (if requested), community meetings (if requested), a 1-800 projects information line and a dedicated email address.

The following summarizes consultation and outcomes completed since the submission of the Initial Project Description:

Table 21. Indigenous Group Consultation Summary

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
Driftpile First Nation	Sent project information twice; left 3 messages for the Nation and followed up by emails	Site visit was completed November 18, 2019, no concerns.	PLPLP committed to the Consultation Director that we will send updates on the project to the Consultation Director on behalf of the community and continue to engage as per the information in Section 8.4 below.
Duncan First Nation	Sent package twice. Correspondence by email.	Spoke with Ken Rich, was advised that Tim and Matt will be looking at the site. No concerns currently	PLPLP committed to Ken Rich that we will send updates on the project to him on behalf of the community and continue to engage as per the information in Section 8.4 below.
Horse Lake First Nation	Previously consulted during ACO process and PLPLP received a “letter of low concern” from the Nation.	The nation indicated that they are satisfied with initial engagement but would like to receive updates as they are known.	PLPLP committed that updates will be communicated to the Chief as well as the

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
			consultation and Aboriginal Skills and Employment Training Strategy (ASETS) department managers on behalf of the community and will continue to engage as per the information in Section 8.4 below.
Kapawen’o	Sent information package. Correspondence by phone.	Nation to hold a site visit at the Project location coordination with PLPLP.	PLPLP committed to sending updates to project to the First Nation Liaison on behalf of the community and continue to engage as per the information in Section 8.4 below.
Sawridge First Nation	Sent information package. Correspondence with the nation’s liason by phone.	Would like to do a site visit, extremely busy as there is no administrator.	PLPLP is willing to assist with a site visit once consultation liaison is available . All updates to the project will be communicated to the

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
			consultation liaison and PLPLP will continue to engage as per the information in Section 8.4 below.
Sturgeon Lake Cree Nation	Sent information package, site visit was conducted	PLPLP spoke with the consultation coordinator on January 22, 2020 and was advised the site visit had occurred and the basic concerns only were noted. It was agreed that updates would be forwarded to the consultation coordinator on behalf of the Nation. On February 14, 2020, the consultation coordinator indicated that they have concerns with the location chosen due to ceremonial plant harvesting. As the location has been previously used by industry and was previously disturbed, PLPLP Stakeholder Manager offered mitigation measures of continuous updates and allowing all plants to be harvested prior to construction. The Stakeholder Manager also requested suggestions if mitigation is found to be insufficient. On February 27, 2020, PLPLP left a message for the	PLPLP will continue to engage as per the information in Section 8.4 below.

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
		consultation coordinator to discuss suggested mitigation options.	
Sucker Creek First Nation	Sent information package, site visit was conducted	January 22, 2020 PLPLP spoke with the consultation coordinator and was advised she was satisfied with initial engagement but would like to receive updates as they are known. The consultation coordinator also indicated they had responded to the IAA in error as their records were not up to date.	PLPLP will provide updates to the project to the Consultation Coordinator and continue to engage as per the information in Section 8.4 below.
Swan River First Nation	Sent information package twice. Correspondence by phone.	Nation to hold a site visit at the Project location. No initial concerns with the project.	PLPLP committed to the Oil & Gas Director that they will provide updates to the Oil & Gas Director and continue to engage as per the information in Section 8.4 below.
East Prairie Metis	Sent information package. Sent email to go forward with a map review of the project location.	The nation indicated that they are satisfied with initial engagement but would like to receive updates as they are known.	PLPLP committed to the consultation coordinator that they will provide updates to the consultation coordinator and continue to engage

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
			as per the information in Section 8.4 below.
Metis Nation of Alberta – Region 4	Sent information package. Corresponded by phone	Consultation team lead indicated they are continuing to review the project and would like to receive updates as they are known.	PLPLP will continue to engage as per the information in Section 8.4 below.
Metis Nation of Alberta – Region 6	Sent information package. Corresponded by phone.	Consultation team lead indicated they are continuing to review the project and would like to receive updates as they are known.	PLPLP will continue to engage as per the information in Section 8.4 below.
Aseniwuche Winewak Nation (AWN)	Sent information package. Corresponded by email.	"AWN does not have site specific concerns/objections to this proposed activity/development, however due to the cumulative effect of activity/development we cannot state we have no overall concerns." Nation indicated they are continuing to review the project but would like to receive updates as they are known.	PLPLP committed to Technical Support Coordinator and the that they will provide updates to the Technical Support Coordinator as well as the Chief Operating Officer (COO) for the Aseniwuche Development Corporation (ADC) and continue to engage as per

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
			the information in Section 8.4 below.
Foothills Ojibway First Nation	Sent information package. Corresponded by phone	Consultation representative Ok with project, would like updates once construction has started and opportunities for the community	PLPLP committed to sending updates to the community through the consultation representative and will continue to engage as per the information in Section 8.4 below.
Metis Community Society of Kelly Lake	Sent information package. Corresponded by email.	The group indicated they have no questions in regard to this project at this time. The appropriate people for this project has received all the information. The primary contact will continue to update them with any new information. Met with liaisons sent by the Chief on February 19, 2020. They advised they back the project and would like to be updated on progress and opportunities for the communities	PLPLP committed to updating the communities through liaisons and Chief's and will continue to engage as per the information in Section 8.4 below.

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
Kelly Lake Leadership Group	Sent information package. Corresponded by email.	The group indicated they have no questions in regard to this project at this time. The appropriate people for this project has received all the information. The primary contact will continue to update them with any new information. Met with liaisons sent by the Chief on February 19, 2020. They advised they back the project and would like to be updated on progress and opportunities for the communities	PLPLP committed to updating the communities through liaisons and Chief's and will continue to engage as per the information in Section 8.4 below.
Kelly Lake Cree Nation	Sent information package. Corresponded by email.	The group indicated they have no questions in regard to this project at this time. The appropriate people for this project has received all the information. The primary contact will continue to update them with any new information. Met with liaisons sent by the Chief on February 19, 2020. They advised they back the project and would like to be updated on progress and opportunities for the communities	PLPLP committed to updating the communities through liaisons and Chief's and will continue to engage as per the information in Section 8.4 below.

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
Kelly Lake First Nation	Sent information package. Corresponded by email.	The group indicated they have no questions in regard to this project at this time. The appropriate people for this project has received all the information. The primary contact will continue to update them with any new information. Met with liaisons sent by the Chief on February 19, 2020. They advised they back the project and would like to be updated on progress and opportunities for the communities	PLPLP committed to updating the communities through liaisons and Chief's and will continue to engage as per the information in Section 8.4 below.
Metis Community Members Nose Creek	Sent information package. Corresponded by phone	Spoke with community member Leona Small. She believes there will be no concerns with the project and will be heading out to the community to see if there are any questions	PLPLP committed to updating the communities through Leona Small and will continue to engage as per the information in Section 8.4 below.
Metis Community Members Grovedale	Sent information package. Corresponded by phone	Shannon Dunfield liaison from Métis Community Society of Kelly Lake will be reaching out to the	PLPLP committed to updating the communities and will continue to engage as per

Indigenous Group	Consultation Completed to Date of this Submission	Results of Initial Engagement to Date	Ongoing Commitments
		community to see if there are any questions	the information in Section 8.4 below.
Kelly Lake Metis Settlement Society	Sent information package. Corresponded by email.	Lyle Letendre reached out with concerns about the amount of natural gas being used. PLPLP has responded to the concerns and will continue to answer any questions or concerns that may arise. On February 24 and February 27, 2020, PLPLP left a message for the President to discuss the response to his concerns and to inquire if there were further questions.	PLPLP will continue to engage as per the information in Section 8.4 below.

8.4 FURTHER CONSULTATION AND INFORMATION GATHERING PLAN

PLPLP plans to continue to engage the aforementioned IGs to provide them with information on the gas pipeline to serve the Project and the transmission line options for the PLPP and to solicit their questions and/or concerns.

PLPLP is committed to keeping consultation with IGs and all affected stakeholders ongoing for the PLPP. PLPLP's objective is to provide notification and engage in consultation with potentially affected IGs regarding the progress of the Project during all stages of development.

Where impacts are identified, Prairie Lights will continue to discuss possible mitigation strategies with the applicable IG(s). From those discussions, Prairie Lights would further hope that the degree of impacts could be determined with the IGs after mitigation is explained and ultimately determined.

Should the Project be approved, PLPLP will continue to engage through construction and operation of the Project, as PLPLP believes this will result in a better Project and long-term involvement in the region.

Communication will be ongoing with all interested parties. PLPLP will present the information contained in the applications to local communities through the bulletins per the individual community-based communication plans agreed to by the parties.

Portions of the communication plans have not been finalized with individual groups, however PLPLP will take the following approach until such a time that individual groups that want continued consultation agree to a finalized plan. The plan at this time is as follows:

- PLPLP will provide quarterly communications during the regulatory approval processes and following regulatory approvals.
- Once a firm construction date is known, PLPLP will increase the communications to a monthly basis.
- During construction, PLPLP will provide weekly updates.

The above noted plan will be revisited and modified to satisfy individual Indigenous groups at the request of each Indigenous group and may also be revisited to accommodate changes in responsible persons at each Indigenous group.

Activities may include:

- meetings in the local and regional communities;
- presentations to those groups that are concerned with infrastructure, economic development, environmental management, education, training and employment;
- meetings and discussions with representatives to maintain a close working relationship, including opportunities to modify, expand or redirect these associations, and;
- promoting awareness of the Project in a timely manner through direct email or phone conversations.

8.5 INCLUSION OF INDIGENOUS INFORMATION & EFFECTS ON RIGHTS

Efforts are made to work with land users regarding impacts on their livelihood, and to promote participation in employment and contract opportunities. Awareness and understanding of local perspectives are also imperative.

PLPLP recognizes that the Project is within the traditional territories of the identified groups. PLPLP considered this factor during preliminary siting of the project by attempting to locate the project in an area already disturbed with existing public access. As such, the PLPP is located within an active CANFOR logging and storage area, is located next to heavy industrial use oil and gas facilities, including a CNRL compressor station and frac sand mobilization area, supplied by train, among other impacts. Our siting also took into consideration impacts to the rights of Indigenous Groups to hunt, fish, trap and gather. Again, this location was chosen with consideration that all the activity in the area we would not create any additional disruption to hunting, trapping and gathering in the area. There will also be no impact to rivers or creeks where fishing may occur.

Although long term effects to Indigenous rights has not been identified from consultation to date, Indigenous groups may advise that it is critical to address the Project's short- and long-term impacts on traditional resource use or traditional territory and lifestyles of those using the area. Therefore, PLPLP would rely upon further consultation to determine how both short- and long-term impacts to traditional territories may be mitigated. This may include:

1. Impact on traditional lifestyle activities (e.g., medicinal plant gathering, berry picking, trapping, hunting);
2. Impacts on land use;
3. Effects on wildlife species or species of interest to Indigenous Peoples; and,
4. The potential cumulative effects of the project with existing disturbances on the cultural and land use.

To date, further studies on traditional land use or Ecological Knowledge Studies have not been requested by any groups contacted. At this time, it is unlikely that effects to treaty rights would occur from the PLPP only because of the proximity of the Project to existing disturbances, and the use of existing access, including Highway 40, which would not result in increases in public access to the area. Furthermore, there are no fisheries related impacts or impacts to wetlands or watercourses.

As the PLPP is located on Crown Land, there is no prohibition or restriction to continued access to adjacent crown land resulting from the PLPP. The PLPP does not control access to the project location as the project will be using public roads, and all other incidental activities associated with the PLPP will use existing public access. PLPP will only control access to the power plant lands. As such traditional use areas which may require access restrictions, should not be affected.

Nevertheless, further engagement to discuss potential mitigations of effects for land use, resources for traditional purpose use or practices will continue. Site assessments by a number of group(s) have not revealed any concerns to date. However, if further consultation reveals there is a concern about traditional use or Aboriginal or Treaty rights being affected, or a request that incorporation of traditional knowledge might be useful for the PLPP or the associated components (i.e. pipeline; transmission line), PLPLP will continue to engage with the groups identified and utilize that shareable knowledge to further guide mitigation or possible habitat compensation that may be appropriate or applicable, should they exist.

Further consultation will continue during the lifetime of the Project and PLPLP will request that if any Indigenous Groups request to hold a pre-construction ceremony at the PLPP, that they assess the area for potential historical resources, sacred sites, or culturally important resources. If they deem there is potential, PLPLP will consult with the Indigenous group and the HRMB and obtain the services of an archaeologist to determine next steps. If undocumented historical resources are discovered or identified during construction, all of the Indigenous Groups will be immediately notified.

If Indigenous groups identify culturally important resources (i.e. a specific or multiple vegetation species), PLPLP would ask if the resources should / could be harvested by the Indigenous group(s) prior to any construction occurring.

Further to that, mitigation will be developed in consultation with the respective group(s) to reduce the significance of any effects if groups are willing to contribute time to this process.

8.6 FOLLOW UP AND MONITORING PROGRAMS

PLPLP is committed to supporting Indigenous opportunities throughout the lifetime of the Project. This will include training as identified in Section 8.7 below, to support construction monitoring during the construction and interim reclamation of soils and vegetation.

Personnel assigned to this Project will have the environmental protection duties, responsibilities, and authority defined by their job positions. Each person is responsible for protecting the environment.

A Construction Manager will be appointed to the Project to oversee construction activities at the Project site and will be responsible for the implementation of and compliance with the related environmental plans and regulatory requirements. The Construction Manager is also responsible for communicating environmental protection procedures and promoting compliance with federal and provincial legislation and municipal bylaws.

PLPLP will hire an Environmental Monitor to observe, record and report on environmental compliance and conformance during construction activities. The Environmental Monitor will document construction activities, environmental management and protection provisions and will report to the Proponent's owner representative. The Environmental Monitor will contact the owner's representative with deficiencies and related concerns.

During construction, incidents that qualify as being in non-compliance of applicable laws, commitments, requirements, and/or specific approval conditions by regulators, will be reported by staff to the Construction Manager. The Construction Manager will consult with the Environmental Monitor ('EM') and PLPLP will take the necessary steps to rectify the situation through applicable notification of regulators, implementation of suitable mitigation measures to bring the incident into compliance, record keeping of the circumstances that resulted in the non-compliance, any remedial measures taken, and any recommendations for future monitoring.

8.6.1 INTERIM AND FINAL RECLAMATION PROGRAMS

PLPLP will create a detailed Construction and Reclamation Plan to guide pre-construction and post-construction reclamation at the PLPP. The intent of the interim reclamation is to support vegetation growth and soil stabilization in and around the PLPP once construction is completed for stabilization during operations.

PLPLP will seek input from the Indigenous Groups during final reclamation of the project lands at the end of the PLPP lifecycle to ensure that consideration of traditional, or future land use by these groups is incorporated into any restoration plans. This may include the use of vegetation species that may not only support reclamation, but might also support berry picking, for example. Further reclamation design may also consider how the project lands could be used in support of the practice of indigenous rights. For example, this might include re-planting of coniferous vegetation to support larger ungulates, or perhaps a design that accommodates ceremonial use. These ideas wouldn't currently comply with Alberta Environment requirements for reclamation and PLPLP would be bound by regulations for reclamation, but as indigenous knowledge is incorporated into restoration, this may be a culturally important consideration at that time.

Furthermore, given that the project could last 30 years or more, surrounding land use is currently unknown. The use of traditional knowledge may support the restoration of the greater area as a whole.

8.7 EMPLOYMENT, CAREER AND BUSINESS OPPORTUNITIES – INDIGENOUS PERSON(S)

Employment, career and business opportunities for Indigenous persons include the following:

1. Participation in Economic Benefits – communities have a strong interest in the economic benefits that could accrue to their community. The interest of individuals and communities to participate in economic benefits through employment, training, contracts and other means in support of the community social structure during the assessment, construction and ongoing operation of the Project has been stressed.
2. PLPLP has numerous business relationships in the area which provide opportunities for local service providers and will support these companies in developing or expanding their capacity to support the indigenous groups.
3. PLPLP may provide mentorship to several entrepreneurs from Indigenous communities to support local capacity development.
4. PLPLP utilizes a prequalification tool where interested service providers can register for contracting opportunities. Additionally, PLPLP maintains an internal, community-

based contractor list sorted by service, which positions PLPLP to ensure local service providers are identified and included in the bid process. PLPLP intends to continue this approach going forward with the Project.

5. When appropriate, PLPLP will guide local individuals or service suppliers with pre-qualification requirements to increase access to the different phases of the Project lifecycles. For example, the basis for environmental monitor training may include the learnings from the Alberta Government *Environmental Monitoring Technician Training for First Nations and Metis Communities in Oil Sands Regions, Alberta* (July 2017).
6. Through the Project construction and operation phases, PLPLP will engage with communities to discuss workforce needs, and where feasible, identify opportunities to develop local skills through training as appropriate. PLPLP will utilize existing training institutions, and service providers, as well as mentorship opportunities by PLPLP staff to support trainee's skill development.
7. Although a component of the training requirements, safety training will be provided during construction and operations for all work site personnel.
8. PLPLP will develop an inclusion requirement to ensure that minimum requirements for employment of women or other underrepresented groups are met during the construction and operation at the PLPP. The requirements have not yet been established but will be based upon further employment and business opportunities as identified above.

9 CONSULTATION WITH THE PUBLIC OR OTHER PARTIES

As per AUC Rule 007 requirements, a Participant Involvement Program (PIP) was undertaken by PLPLP (Appendix F - Consultation Program) the goal of the PIP was to equip all potentially affected stakeholders with any necessary information and understanding regarding the project to enable them to provide their questions, concerns, and suggestions through personal consultations and other engagement methods.

Consultation and notification included landowners, occupants, residents, agencies, Indigenous Peoples and industrial interest holders who may potentially be impacted by the PLPP.

Beginning in March 2019, PLPLP initiated a PIP for the Project in accordance with AUC Rule 007 - Appendix A1 (PIP Guidelines). The PIP report is subsequently provided to the AUC to ensure that adequate and meaningful consultation has occurred.

PLPLP is confident that the PIP has succeeded in ensuring that stakeholders:

- have been properly and adequately notified about the Project; and,
- have been given the opportunity to ask questions and raise issues and concerns about the Project and have had those questions, issues and concerns addressed

9.1 OVERVIEW OF KEY COMMENTS AND CONCERNS EXPRESSED BY STAKEHOLDERS

To date, no questions or concerns have been raised by any stakeholders notified above noted consultation program. The IAA received comments from 4 individuals as part of the Project Description review process. The comments are summarized as follows:

1. Devin Smith: Comments related to where the power from the power plant will be going; how will the power affect end user costs; will there be additional environmental impacts, and will there be power lines from the power plant.
2. Russell Penson: Request twinning of Highway 40.
3. S. Louis Stikker: Concerned with possible effects of seismic activity from oil and gas.
4. WMS: No concerns expressed as long as funding from private sector

9.2 OVERVIEW OF ONGOING CONSULTATION ACTIVITIES

PLPLP will continue the PIP over the coming months with new stakeholders who buy, lease, rent, or occupy properties within a minimum of 2000 m from proposed facilities and with other stakeholders seeking additional information. Discussions with stakeholders will continue throughout application review, pre-construction, construction, and operation activities.

PLPLP is committed to keeping consultation with landowners, municipalities, Indigenous groups and all affected stakeholders ongoing. PLPLP objective is to provide notification and engage in consultation with affected stakeholders regarding the progress of the Project during all stages of development.

PLPLP will continue to maintain the relationships it has built with its stakeholders as the Project moves forward, and should the Project be approved, will continue to engage with stakeholders through construction and operation of the Project, as they believe this will result in a better Project and long-term involvement in the region.

PLPLP has attempted to address the individual comments received (refer to Section 9.1 above) through the responses in this document.

9.3 CONSULTATION WITH OTHER JURISDICTIONS

Refer to Section 3.2 for a description of engagement with other regulatory jurisdictions.

10 VULNERABLE POPULATION GROUPS

The PLPP can influence employment practices to a very small extent - for example, 2016 census data³³ indicates that the city of Grande Prairie had a population of 62,320, with those between working ages of 15 – 64 years at 44,365 persons. The PLPP would likely only employ up to 300 people at peak construction, or 0.67%. The extent to which the PLPP can reinforce or challenge gendered and racialized norms relating to what has been considered appropriate work for women and men, Indigenous and non-Indigenous peoples, as well as those with differing abilities is likely extremely limited.

Furthermore, as it evident there are no communities adjacent to the PLPP project area and local workforces will be procured from the existing Indigenous groups and/or City of Grande Prairie.

Nevertheless, PLPLP is committed to giving consideration for employment and contracting opportunities to local and regional communities that supply competitive goods and services. PLPLP will work towards removing barriers to participation in economic opportunities created by the project.

To meet this commitment, PLPLP will evaluate the opportunities that may exist for locals to supply goods and services to the project. One way is to ensure that the proposed EPC contractor create work packages that are structured in a manner to create opportunities for local communities to participate independently or in a joint venture with other contactors / organizations.

³³Statistics Canada. Cenus Profile, 2016 Census, Grande Prairie. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=0336&Geo2=PR&Code2=48&SearchText=Grande%20Prairie&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=0336&TABID=1&type=0>

PLPLP will develop policies and procedures to ensure the work environment is sensitive to any gender and inclusion issues. Please refer to Section 11 for further information.

10.1 EMPLOYMENT CONSIDERATIONS

Initial baseline studies can reveal how women and men are currently employed in the wage workforce and in customary livelihood occupations. This is particularly important for rural and Indigenous communities where “pluri-activity” (multiple activities in the formal and informal economies) often characterize household incomes. Understanding how the community’s economy and livelihoods are structured can elucidate impacts related to the types of jobs that the resource activity will bring and who will benefit both by income and by status. Examination of employment will help to identify:

- Existing socio-economic conditions of the households and communities potentially employed by the Project.
- Division of labour – which jobs go to what people within and outside of the community
 - What training opportunities are made available for prospective workers
 - How accessible these opportunities are for different group men and women; prospective subcontractors with families; prospective subcontractors without private transportation;
- Consider whether there are barriers for different groups to take up employment (e.g., women who have child or elder-care responsibilities may not be as able to take on shift work that often accompanies higher paid employment at work sites);
 - Create targets for employment by sub-contractors and PLPLP that are monitored and communicated;
 - Ensuring health and safety of the workforce;
- Consider how the PLPP may affect employment in other business sectors subcontracted (e.g., trucking) and whether there are opportunities for these underrepresented groups to be employed and/or supported.

10.2 SOCIAL CONSIDERATIONS

While increased wage employment and associated income is often considered a “general good”, several other effects are associated with this that must be considered. Increased time away from

family in rural and Indigenous communities may give rise to family stress and disruptions, requiring careful consideration of social needs and impacts such as:

- Childcare – likely more flexible childcare arrangements that can correspond with shift schedules may be required.
- Social services – to address family disruption and stress.
- Youth and elder needs – possibly including recreational and cultural needs.
- Support services to address family support.

10.3 CONTINUING ENGAGEMENT

Engagement of both Indigenous groups and subcontractors will continue to determine:

1. How to involve people at all phases of construction through monitoring;
2. Consider multiple ways to continue to engage Indigenous groups, beyond formal public meetings throughout the lifespan of the project.
3. Requesting information from Indigenous groups about their specific conditions relating to employment by gender types in their specific communities; and,
4. Consulting with social services, health services or other social support services in each community to determine if there are opportunities for the PLPLP to contribute to ongoing social support through those organizations.

10.4 ONGOING COMMITMENTS

PLPLP is committed to understanding both the positive and potential negative impacts that would require the identification of mitigation strategies, the determination of which groups were at greatest risk, and how these impacts can be reduced or eliminated.

The role of the PLPP in exacerbating existing adverse conditions would also be assessed, and opportunities for improvement and mitigation can be built into project implementation. These can also shift throughout the project's lifetime. Some negative impacts may be more substantial during initial stages but diminish during later ones.

Given that PLPLP will be relying upon communities in proximity to the Project for construction and operations, PLPLP commitment to continuing to understand gender bias in the employment practices under which it controls can assist PLPLP to formulate strategies, plans and policies to

address concerns and create a safe and inclusive workplace experience, support worker retention, and reduce the impacts/costs of worker replacement.

Once initiatives are developed and chosen, PLPLP will continue to monitor and evaluate the implemented recommendations and strategies to ensure they are being met and that ongoing issues are identified.

11 LABOR FORCE AND PLPLP POLICIES

To the greatest extent possible, labour will be contracted from existing surrounding communities, including the City of Grande Prairie and nearby Indigenous communities. No camps or worker facilities dedicated to the Project will be required in any of these communities.

PLPLP is committed to giving consideration for employment and contracting opportunities to local and regional communities that supply competitive goods and services. PLPLP will work towards removing barriers to participation in economic opportunities created by the project. The local contractors and suppliers will be encouraged to participate in areas where they possess the necessary skills and capabilities.

To meet this commitment, PLPLP will evaluate the opportunities that may exist for locals to supply goods and services to the project. One way is to ensure that the proposed EPC contractor create work packages that are structured in a manner to create opportunities for local communities to participate independently or in a joint venture with other contractors /organizations. As well, in order to verify the level of success achieved, a reporting mechanism will be required of the EPC contractor. and will be subject to audit by PLPLP.

The EPC contractor, in conjunction with the PLPLP will develop a Master Project Bidders List to be approved by PLPLP. The suppliers on the list will represent preferred suppliers, suppliers of choice, those with existing supply contracts and those who have shown, with positive record of accomplishment, that they have the ability, facilities and personnel to produce the equipment, material or services to an acceptable quality standard, within the required schedule and cost constraints. The list also gives due consideration for Indigenous Group, local, regional, Albertan, Canadian, North American and international manufacturers and suppliers based on the requirements and commitments of the project.

In 2019, a Solicitation of Interest (SOI) questionnaire was sent to EPC bidders. The purpose of the SOI was to obtain a high level understanding of EPC bidders' financial status, openness to various contracting terms, availability, experience and history of executing projects of this size and nature, health and safety, and any other general information about their organization. When the project formally issues the RFP for EPC of the PLPP, project commitments for inclusion

(Indigenous Groups, GBA, Local Content, and other requirements outlined in the various sections above) will be identified in the Instruction to Bidders. Compliance with these project commitments will then be taken into account in consideration of the EPC bidder's offering.

PLPLP creates an inclusive workplace by ensuring all employees are treated with respect and given the opportunity to participate in all aspects of the employment process without discrimination.

This includes removing discriminatory barriers that prevent individuals from getting a job or promotion and ensuring that the work environment is free from discrimination.

Furthermore, PLPLP workplace and labor inclusivity includes:

- Creating behavioral standards, diversity metrics, and holding leaders accountable for results;
- Training people at all levels on topics related to diversity;
- Integrating diversity and inclusion strategies in recruitment, performance management, leadership assessment, and training;
- Creating employee networks to bring people together;
- Meet regulatory requirements for providing a safe workplace;
- Treat Individuals fairly and with respect;
- Promote a healthy and productive workforce and a safe workplace;
- Protect communities affected by our operations;
- Protect the environment;
- Creating an internal and externally visible scorecard to measure progress in all areas. Such scorecards include metrics for
 - recruiting,
 - compensation levels,
 - participation in learning programs, and,
 - turnover.
- Evaluating suppliers in contract negotiations for commitments to:
 - policies for Indigenous groups
 - policies for gender diversity

Some of the component PLPLP internal workplace policies also include:

11.1 PLPLP HEALTH, SAFETY AND ENVIRONMENTAL POLICY

PLPLP will conduct business with respect and care for our employees, contractors, communities, and the environments in which we operate.

PLPLP vision is zero harm to people and to protect and provide stewardship for the environment. We believe that excellent health, safety, and environmental performance is an integral part of our business success and corporate responsibility. To fulfill this commitment, PLPLP will:

- Ensure that management accepts full responsibility for protecting workers and the environment.
- Proactively identify and mitigate hazards within our operations which could cause harm to people or adverse effects on the environment.
- Commit resources to ensure personnel and representatives have adequate information and training to perform their roles in a safe and environmentally friendly manner.
- Conduct all operations in a manner that meets or exceeds all regulatory requirements and practices.
- Work actively to continuously improve health, safety and environmental performance.
- Actively monitor and measure HSE performance to focus on areas of continuous improvement.
- Ensure emergency response procedures are in place and that all incidents are reported and adequately investigated.
- Communicate HSE expectations and partner with employees and contractors who share these values and strive to continuously improve HSE performance.
- Create a culture of open feedback from internal and external stakeholders regarding our HSE management system and performance.

We firmly believe responsibility for application of this policy rests with management, employees, and contractors associated with our company. PLPLP strongly encourages everyone's right to stop work in the event that they cannot control a hazard that may cause harm to themselves, their co-workers or the environment or to stop an act of non-compliance.

11.2 ALCOHOL AND DRUG POLICY

Regardless of when or where they are used, alcohol and drugs have the ability to negatively impact a person's ability to work in a safe manner. PLPLP is committed to ensuring our worksites, the environment, and our employees and contractors are not put at risk because of impairment in and in association with the workplace. To that end, PLPLP has developed an Alcohol & Drug Policy.

Everyone who works with and for PLPLP is expected to understand the risks of impairment to workplace safety, and to be able to identify and respond to those risks in compliance with this Policy. Individuals must comply directly with this Policy and any supporting PLPLP programs.

PLPLP also expects that when individuals are on the worksite of another company, PLPLP must ensure that individuals comply with such company's policies on safety and alcohol and drug usage.

In addressing workplace safety risks caused by impairment in and in association with the workplace PLP priorities are to:

- Meet regulatory requirements for providing a safe workplace.
- Treat Individuals fairly and with respect.
- Promote a healthy and productive workforce and a safe workplace.
- Protect communities affected by our operations.
- Protect the environment.
- Define clear, specific alcohol and drug work rules.
- Provide understandable and predictable responses to breaches of this Policy.
- Implement alcohol and drug testing as needed.
- Provide assistance to Individuals when required.
- Answer questions and concerns about the Policy as needed.

11.3 WORKPLACE HARASSMENT AND VIOLENCE

The management of Prairie Lights Power. (the "Company") is committed to providing a work environment in which all workers are treated with respect and dignity. PLPLP will take whatever steps are reasonable to protect workers from the potential hazards associated with workplace harassment and violence.

In support of this policy, PLPLP has put in place workplace harassment and violence prevention procedures. The procedures include measures and procedures to protect workers from workplace harassment and violence, a means of summoning immediate assistance and a process for workers to report incidents or raise concerns.

The Company will ensure this policy and the supporting procedures are implemented and maintained. All workers and supervisors will receive relevant information and instruction on the contents of the policy and procedures. All management and supervisors will also adhere to this policy and the supporting procedures. Supervisors and management are responsible for ensuring that measures and procedures are followed by workers and that workers have the information they need to protect themselves. PLPLP will review this policy and the associated procedures at least every three (3) years.

11.4 WHISTLEBLOWER POLICY

PLPLP is dedicated to maintaining a high standard of honesty and integrity. All Prairie Lights Power's employees are required to comply with applicable laws, regulations, and policies, such as the PLPLP Code of Business Conduct. Inappropriate behaviour with respect to our staff, consultants, and stakeholders will not be tolerated.

The Whistleblower Policy will ensure that any perceived acts or circumstances of financial or ethical misconduct will be identified, addressed and subsequent corrective action taken where appropriate.

11.5 ANTI-CORRUPTION POLICY

PLPLP is committed to operating in accordance with the highest ethical and professional standards. Accordingly, the Company will conduct all of its business dealings with honesty and integrity. The Company also expects all of its directors, officers, employees, partners, contractors, consultants, and agents to conduct business in accordance with the law and highest standards of ethical behavior.

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Appendix A - Additional Figures

Figure 13. Grizzly Bear and Trumpeter Swan Habitats

Figure 14. Parks and Recreational Areas




Figure 15. Indigenous Reserves and Settlements

Figure 16. Wetlands and Watercourses

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FIGURE 13

**Prairie Lights Power
Project
Trumpeter Swan
Grizzly Bear**

-  Grande Cache Grizzly Bear Range
-  Trumpeter Swan 500m buffer
-  Project Area



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter



0 2 4 8 km

1:150,000 Scale when printed @ 11" x 17"

Drawn By: LP

Date: 2019-07-17



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Prairie Lights Power GP Inc.

FIGURE 14

**Prairie Lights Power Project
Parks and Provincial Areas**

-  Big Mountain Creek Provincial Recreation Area
-  Jasper National Park
-  Kakwa Wildland Area
-  Musreau Lake Provincial Recreation Area
-  Wilmore Wilderness Park
-  Project Area



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter



0 10 20 40 km

1:900,000 Scale when printed @ 11" x 17"

Drawn By: LP

Date: 2019-07-18



McCallum Environmental Ltd.

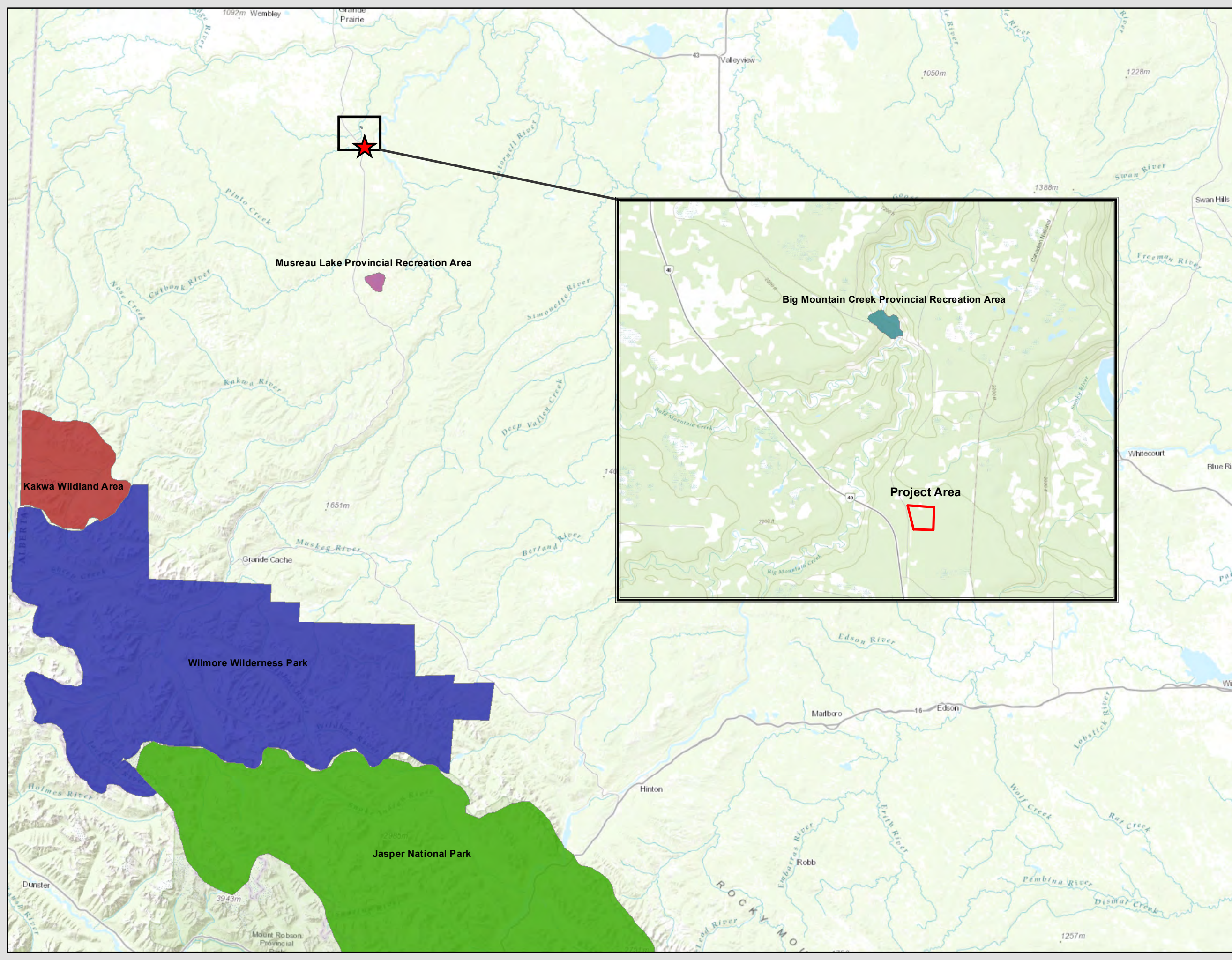




FIGURE 15

**Prairie Lights Power Project
First Nations Reserves and
Metis Settlements**

-  Metis Settlement
-  First Nations Reserve



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter



0 15 30 60 km

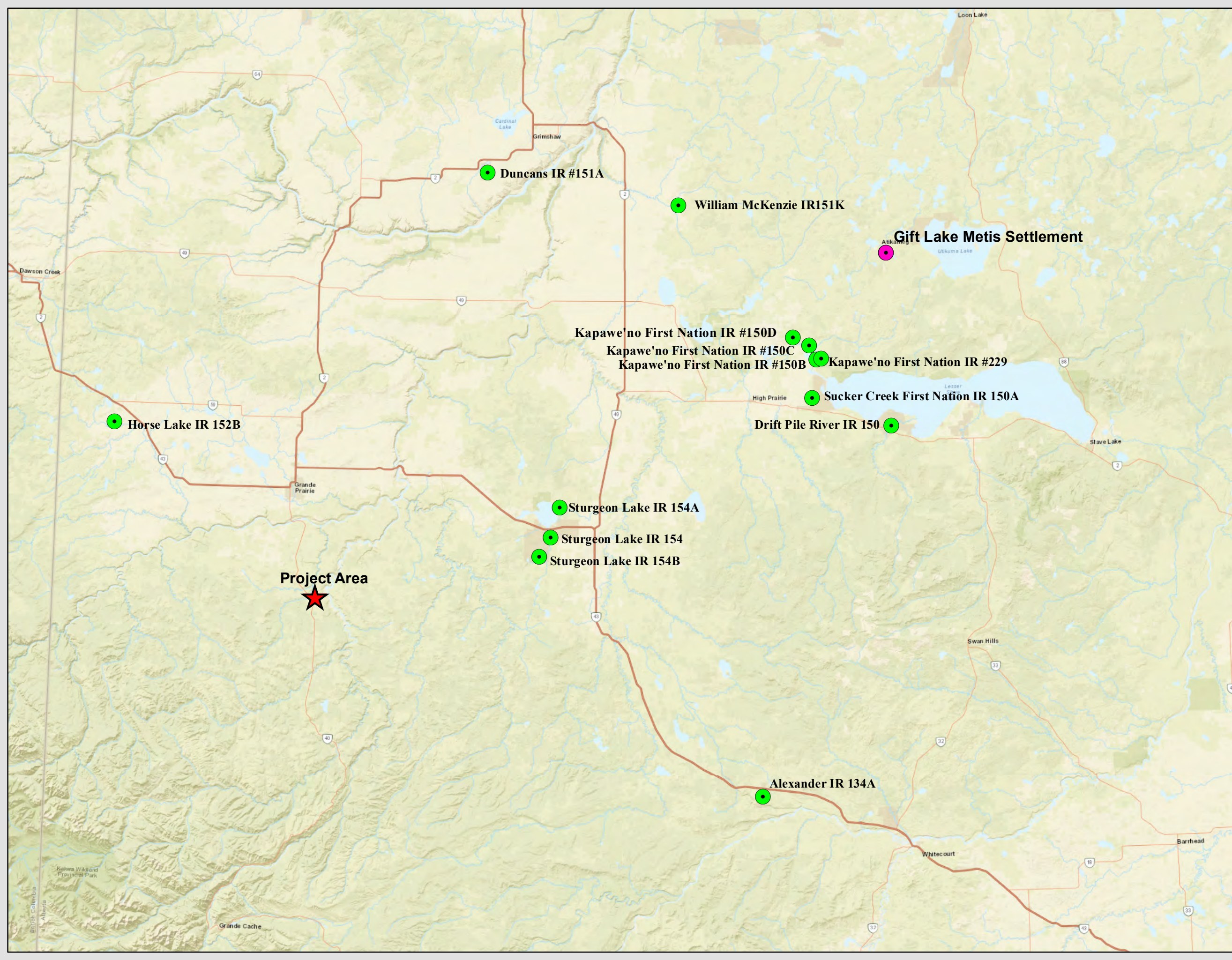
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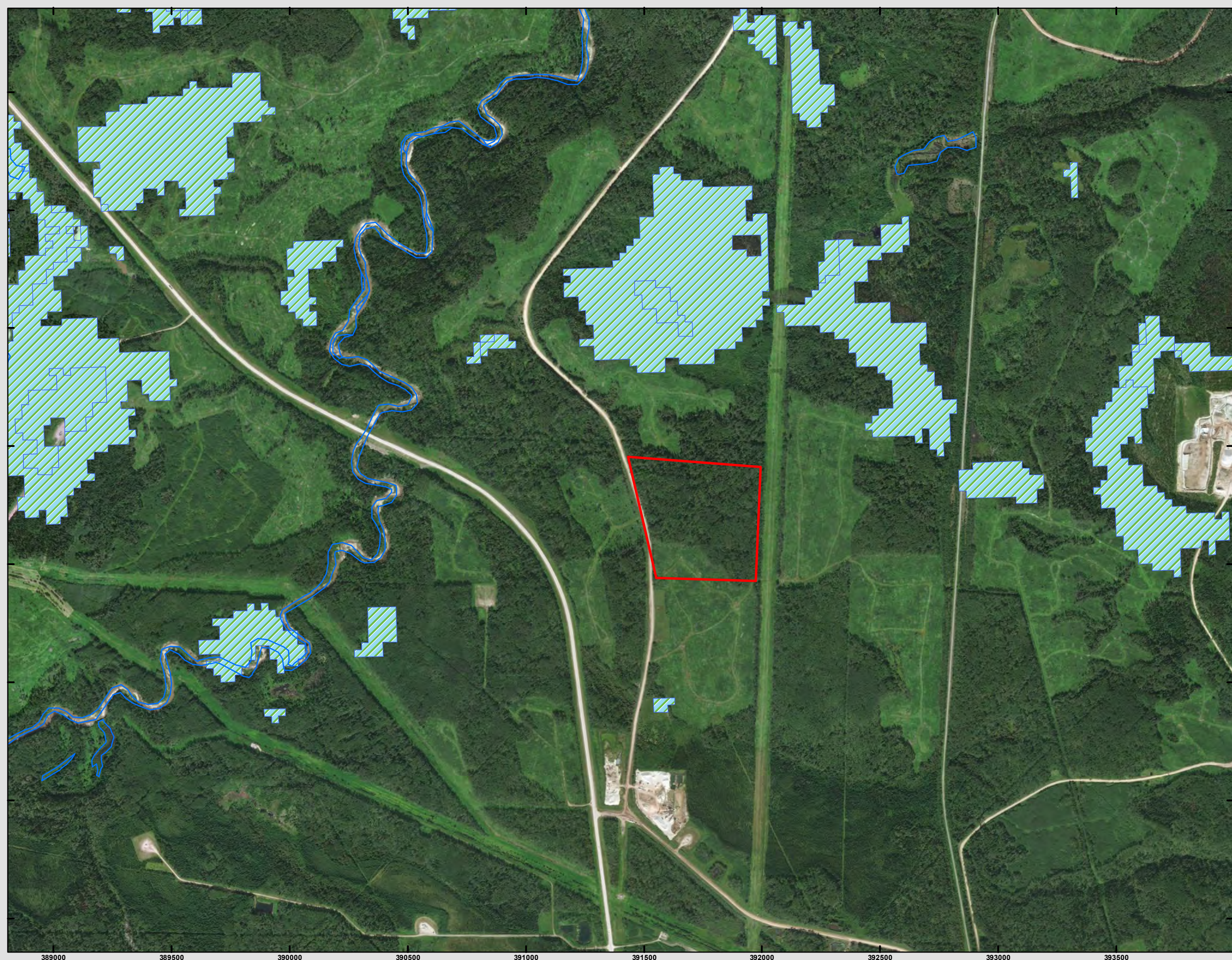
Drawn By: LP

Date: 2019-09-11



McCallum Environmental Ltd.








Prepared For:

Prairie Lights Power GP

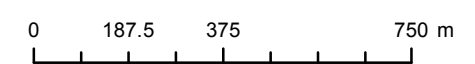
FIGURE 16

**Prairie Lights Power Project
Mapped Wetland and
Watercourse Features**

-  Watercourses (AB Inventory)
-  Wetlands (AB Inventory)
-  Project Area



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter



1:15,000 Scale when printed @ 11" x 17"

Drawn By: John R. Gallop Date: 2019-04-04



McCallum Environmental Ltd.

Appendix B – Concordance Table

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
1. Project name, type or sector and proposed location	Section 1 Section 1.1 Section 2
2. Proponent's name and contact information and primary representative for the purpose of the description	Section 3
3. A summary of engagement undertaken with any jurisdiction or other party, including a summary of key issues raised and the results of the engagement and a brief description of any plan for future engagement	Section 3.3 Section 3.3.1 Section 8 Section 9
4. A list of indigenous groups that may be affected by carrying out the project, a summary of engagement undertaken with the Indigenous peoples of Canada including a summary of key issues raised and the results of the engagement and a brief description of any plan for future engagement.	Section 3.3 Section 8
5. Any study or plan, relevant to the project, that is being or has been conducted in respect of the region where the project is to be carried out, including a regional assessment that is being or has been carried out under section 92 or 93 of the Act or by any jurisdiction, including by or on behalf of an Indigenous governing body, if the study or plan is available to the public.	Section 3.5
6. Any strategic assessment relevant to the project, that is being or has been carried out under Section 95 of the Act.	Section 3.5

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
Project Information	
7. A statement of the purpose of and need for the project, including potential benefits	Section 2.3
8. The provisions in the schedule to the Physical Activities Regulations describing the project in whole, or in part.	Section 4.2 Section 4.1
9. A list of all activities, infrastructure, permanent or temporary structures and physical works to be included in and associated with the construction, operation and decommissioning of the project.	Section 4.3 Table 2 Table 3 Table 4 Figure 8
10. Estimate of the maximum production capacity of the project and a description of the production processes to be used.	Section 4.2
11. The anticipated schedule of construction, operation, decommissioning and abandonment, including any expansion.	Table 13
12. A list of: <ul style="list-style-type: none"> a. Potential alternatives means of carrying out the project that the proponent is considering and that are technically and economically feasible, including the use of best available technology; and, b. Potential alternatives to the project that the proponent is considering and that are technically and economically feasible and directly related to the project. 	Section 3.2.3 Section 3.2.4
Project Location Information	
13. A description of the project location, including:	
a. Its proposed geographic coordinates,	Section 2.2

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
including for linear development projects, the proposed locations of major ancillary facilities that are integral to the project and a description of the spatial boundaries of the proposed study corridor	
b. site maps produced at an appropriate scale in order to determine the project's proposed general location and spatial relationship of project components.	Figure 1 Figure 2 Figure 3 Figure 8 Figure 10
c. A legal description of the land to be used for the project, including if the land has been acquired, the title, deed, or any document and any authorization relating to a water lot.	Section 2.2
d. The project's proximity to any permanent seasonal or temporary residences and the nearest affected communities.	Section 3.1.4.1
e. The project proximity to land used for traditional purposes by Indigenous peoples of Canada, land in a reserve as defined in subsection 2(1) of the Indian Act, First Nation land as defined in subsection 2(1) of the First Nations Land Management Act, land that is subject to comprehensive land claim agreement or a self-government agreement and any other land set aside for the use and benefit of Indigenous peoples of Canada; and,	Section 5.1.4 Section 5.1.4.2 Section 5.1.4.3 Figure 15
f. The project proximity to federal land.	Section 5.1.4.4 Section 5.1.4.5 Figure 15
14. A description of the physical and biological environment of the project location.	Section 5.1 Section 7.2

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
15. A brief description of the health, social, and economic context in the region where the project is located, based on information that is available to the public or derived from any engagement undertaking.	Section 5.3
Part D – Federal, Provincial, Territorial, Indigenous and Municipal Involvement	
16. A description of any financial support that federal authorities are or may be providing to the project.	Section 6.1
17. A list of any federal lands that may be used for the purpose of carrying out the project.	Section 6.2
18. A list of any jurisdictions that powers, duties or functions in relation to an assessment of the project’s environmental effects.	Section 6.3
Part E – Potential Effects of the Project	
19. A list of any changes that as a result of the carrying out of the project, may be caused to the following components of the environment that are within the legislative authority of the Parliament:	
a. Fish and fish habitat as per 2(1) of the Fisheries Act.	Section 7.4.1
b. Aquatic species as per 2(1) of the Species at Risk Act; and,	Section 7.3
c. Migratory birds, as per 2(1) of the Migratory Birds Convention Act, 1994.	Section 7.3.6.1.3
20. A list of any changes to the environment that, as a result of the carrying out of the project, may occur on federal lands, in a province other than the province in which the project is proposed to be carried out.	Section 7.5

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
<p>21. With respect to the Indigenous peoples of Canada, a brief description of the impact – that, as a result of the carrying out of the project, may occur in Canada and result from any change to the environment – on physical and cultural heritage, the current use of lands and resources for any traditional purposes and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, based on information that is available to the public or derived from any engagement undertaken with Indigenous peoples of Canada.</p>	<p>Section 8</p>
<p>22. A brief description of any change that, as a result of the carrying out of the project, may occur in Canada to the health, social or economic conditions of Indigenous peoples of Canada, based on information that is available to the public or derived from any engagement undertaken with Indigenous peoples of Canada.</p>	<p>Section 7.6 Section 8</p>
<p>23. An estimate of the Greenhouse gas emissions associated with the project.</p>	<p>Section 4.4.1.4 Section 4.4.1.5</p>
<p>24. A list of the types of waste and emissions that are likely to be generated – in the air, in or on the water and in or on land – during any phase of the project.</p>	<p>Section 4.4</p>
<p>Part F - Summary</p>	
<p>A plain language summary of the information that is required under items 1 to 24 in English and in French.</p>	

Appendix C - Summary of Issues Document

Prairie Lights Power Project - Summary of Issues

This document provides a high-level summary of the issues raised through comments received by the Impact Assessment Agency of Canada on the Prairie Lights Power Project (the Project) during the comment period on the Initial Project Description submitted by Prairie Lights Power GP Inc. (the proponent). Original submissions are posted on the Canadian Impact Assessment Registry (Registry Project #80324). Categories are listed in alphabetical order.

Summary of Issues	Response Section in Detailed Project Description
Accidents and Malfunctions	
Effects of accidents or malfunctions, including spills of hazardous substances, uncontrolled releases of explosive gases, and ability of emergency services to respond. Consider spill prevention, preparedness, and response measures and systems.	4.6 Appendix N
Notification process to potentially affected Indigenous peoples in the case of fugitive emission leaks.	4.6 Appendix N
Acoustic Environment	
Effects of noise on human health, including from construction activity, machinery use and increased vehicle traffic.	4.4.2.1 Appendix O
Alternative Means of Carrying Out the Project	
Expanded list of alternatives to, and alternative means of, carrying out the Project, including options that could reduce greenhouse gas (GHG) emissions.	3.1.2.3
Atmospheric Environment	
Effects on air quality including from exhaust emissions, fugitive dust, fuel combustion by-products, vehicular traffic and exposed soils during construction and operation and associated effects on human health.	4.4.1.5
Effects on air quality due to exceedances of the Canadian Ambient Air Quality Standards for nitrogen dioxide (NO ₂) emissions predicted by the proponent.	4.4.1.5
Inclusion of mitigation measures for dust control.	4.4.1.5.4
Climate Change and Greenhouse Gas Emissions	
Effects on the Government of Canada's ability to meet its environmental obligations and commitments with respect to climate change and goal of reducing GHG emissions	4.4.1.4.1 4.4.1.4.2
Cumulative Effects	
Cumulative effects on the cultural, social, health and economic conditions of Indigenous peoples, including the loss of Indigenous traditional territory due to industrial development.	8.5 10
Cumulative effects of climate change and GHG emissions.	4.4.1.4.2
Cumulative effects of flow withdrawals from the Smoky River on fish and fish habitat.	No longer applicable – please refer to Section 1 – Introduction.
Cumulative effects to navigation with consideration for surrounding works.	4.3.4.1 4.3.4.2

Prairie Lights Power Project - Summary of Issues

Summary of Issues	Response Section in Detailed Project Description
Cumulative effects to sensitive ecosystems due to increases in criteria air contaminants that can potentially contribute to acid deposition.	7.3.6.2.1
Drinking Water	
Effects on potable water sources including local alterations to groundwater.	7.3.5 7.3.7.4.4.
Economic Conditions	
Clarity on potential changes to the quality of life of the local population, including the accessibility and affordability of energy, and effects on domestic electricity costs.	4.7
Clarity on the economic impacts of the Project, particularly relating to a diverse labour force, including consideration for women and Indigenous peoples' employment or entrepreneurship opportunities in the energy sector.	10
Local labour force participation and training, including through engagement with Indigenous employment and training programs.	10
Clarity on current labour market conditions and any anticipated changes due to the Project.	10
Effects of the Environment on the Project	
Effects of potential seismic activity from adjacent oil and gas development.	7.8.1
Effects of environmental conditions such as climate change on the Project itself.	7.8.2
Fish and Fish Habitat	
Effects on fish and fish habitat and water quality from the use of herbicides.	No longer applicable as per Section 1.1 7.4.1.1
Effects on fish and fish habitat in the watercourses, including from changes in flows, waterbody or wetland crossings and impingement or entrainment in the outlet.	No longer applicable as per Section 1.1 7.4.1.1
Effects on fish and fish habitat due to the introduction of warm water to a cooler water system from the return and run-off water outlet.	No longer applicable as per Section 1.1 7.4.1.1
Effects on sensitive fish species including Bull Trout and Arctic Grayling.	No longer applicable as per Section 1.1 7.4.1.1
Clarity on the existing and additional water withdrawal volumes, considering the ecological flow requirements for fish.	No longer applicable as per Section 1.1 7.4.1.1
Follow-up and Monitoring Programs	
Inclusion of an Indigenous monitoring program developed with Indigenous peoples to train and employ Indigenous monitors	8.6 8.7

Prairie Lights Power Project - Summary of Issues

Summary of Issues	Response Section in Detailed Project Description
through Project construction and operation, including monitoring for potential cultural effects and potential effects to terrestrial, wetland, and water/watershed environments.	
General – Project Description	
Effects on the volume of traffic on Highway 40.	4.3.1.4.1
Clarity on the number of incoming and outgoing power lines.	3.1.2 3.2.6
Human Health and Well-Being	
Information on how effects on human health may vary based on construction timing and distance to residences.	4.4.1.5.5 4.4.2
Effects and proposed mitigation measures that could occur due to influx of workers such as an increase in crime, increased housing rates, and/or reduced access to community and health services. Include consideration for effects on vulnerable population groups.	10 11
Indigenous and Stakeholder Consultation and Engagement	
Need for meaningful consultation on pre-disturbance assessments, environmental monitoring and adaptive management, and health related research.	8 10
Continuation of engagement efforts throughout the regulatory process, including in the post- decision phase.	8.4 8.6 8.7 10
Inclusion of information heard through engagement and consultation, specifically Indigenous knowledge and Traditional Land Use and Ecological Knowledge Studies.	8.4 8.5 8.6
Indigenous Peoples' Current Use of Lands and Resources for Traditional Purposes	
Clarity on existing land use by Indigenous peoples, informed by engagement.	8.6
Effects on Indigenous peoples' current use of lands and resources for traditional purposes and ability to continue traditional practices such as trapping, hunting, harvesting, gathering (e.g. traditional plants, medicines), teaching, and spiritual practices, including locations (e.g. changes in harvesting of caribou due to changes in migration patterns, etc.).	8.6
Effects on the quality and quantity of resources used for traditional purposes (medicinal plants, native and rare vegetation, natural and old growth dependant forests), due to cumulative effects and increased access from non-community members to remote/culturally important areas.	4.3.1.4

Prairie Lights Power Project - Summary of Issues

Summary of Issues	Response Section in Detailed Project Description
Clarity on the restoration of lands disturbed by Project construction, including temporary workspaces and right of ways, with consideration for potential use by trappers.	8.6.1
Indigenous Peoples' Physical and Cultural Heritage	
Effects on sacred sites, unknown burial sites, or artifacts.	7.7
Clarity on notifying Indigenous groups if historical resources are identified.	7.7
Indigenous Peoples' Social and Economic Conditions	
Effects on Indigenous people's social and economic conditions and wellbeing, including economic development, employment, training, educational and business opportunities for Indigenous peoples. Clarity on partnership opportunities with existing Indigenous service delivery organizations.	8.7
Indigenous Peoples' Rights	
Impacts on the exercise of Aboriginal and Treaty rights, including from loss of land, cumulative effects and how they will be mitigated or accommodated.	8.5
Impacts to the rights of Indigenous peoples due to the location of the Project being on Provincial Crown Land within Alberta Management Unit 356, which allows for hunting for bear, moose, elk, deer, and game birds.	8.5
Migratory Birds and their Habitat	
Effects on migratory birds, eggs, and their nests, through collisions with Project infrastructure, sensory disturbance due to noise and infrastructure lighting, construction activities and the potential for deposition of harmful substances in waters or areas frequented by migratory birds.	7.3.6.1.3 7.4.3
Implementation of appropriate avoidance and mitigation measures for migratory birds.	7.3.6.3
Navigation	
Clarity on the existing and proposed location, size, and type of all water infrastructure, crossings and construction methodology for the proposed pipeline and transmission line to support navigational assessments.	4.3.4.1 4.3.4.2
Details on any existing infrastructure proposed to be used along the Smoky River, in order to accurately assess potential effects to navigation.	4.3.4.2
Purpose and Need for the Project	

Prairie Lights Power Project - Summary of Issues

Summary of Issues	Response Section in Detailed Project Description
Clarity on purpose of the project in relation to where the power is being delivered.	2.3 4.7
Species at Risk, Terrestrial Wildlife and their Habitat	
Effects on wildlife from habitat loss and fragmentation.	7.3.6
Effects on federally listed species at risk, specifically wolverine and caribou, including from noise disturbance.	7.3.2.1.1 7.3.2.1.2
Effects on sensitive species and species of interest to Indigenous peoples, including grizzly bear and trumpeter swan, as a result of the change and disruption of their habitat and migration.	7.3.6.1 7.4.3 7.6.1
Effects to the sensitive species that may come into contact with potentially hazardous chemicals in the stormwater pond.	7.3.6.2
Clarity on when wildlife field assessments were conducted for the Project to ensure seasonal changes in occurrence are captured to provide adequate baseline information. Consider the use of wildlife cameras to capture an accurate representation of wildlife using the area across the year.	7.1 7.1.2 7.1.3 7.1.4
Effects on moose populations as a result of heavy traffic.	7.3.6.3
Effects on wildlife from sensory disturbance and mortality during site preparation.	7.3.6.3
Vulnerable Population Groups (GBA+)	
Analysis of the current environment, considering demographics, socio-economic conditions and cultural trends, including relevant laws and policies.	10
Assessment of positive and negative effects through a GBA+ approach on diverse groups of people, across the Project's lifecycle, including clarity on efforts to narrow gender gaps and other disparities.	10
Inclusion of monitoring programs to reveal inequalities and design mitigation strategies regarding effects to specific populations.	10
Clarity on consultation and engagement processes that ensure transparency and inclusivity, including barriers to participation in consultation for local under-represented groups.	10
Water – Groundwater and Surface Water	
Inclusion of an operational and management plans related to the water intake, including the timing, volumes, permitting, and monitoring of water withdrawal and resulting effects to water levels, fish and fish habitat, and navigation.	No longer applicable as per Section 1.1
Effects on water quality from construction and operation of the Project, including from wastewater, stormwater, and	4.4.3

Prairie Lights Power Project - Summary of Issues

Summary of Issues	Response Section in Detailed Project Description
process water discharge, and accidental releases of solid, liquid, or hazardous waste.	
Effects on nearby watercourses, including Big Mountain Creek and Smoky River.	7.3.7.2
Effects on groundwater, notably from contamination and petroleum/chemical spills.	7.3.5.1 7.3.5.2
Clarity on expected amounts and management of wastewater.	4.4.3

THE FOLLOWING APPENDICES HAVE BEEN PREVIOUSLY PROVIDED

Appendix D - Survey Plan

Appendix E - LAT Report

Appendix F - Consultation Program

Appendix G - Alberta Adequacy Assessment

Appendix H - Air Quality Assessment

Appendix I - ACIMS Data Search Results

Appendix J - AEP Correspondence re. EIA Requirement

Appendix K - Construction Drawing / Grading Drainage Drawing

Appendix L - Equipment List

Appendix M - AUC Approval & Decision

Appendix N - Emergency Response Plan Table of Contents

Appendix O - Noise Impact Assessment