

PROJECT DESCRIPTION

For the
PRAIRIE LIGHTS POWER PROJECT

Project Location
35 km south of Grande Prairie, Alberta

Proponent

PRAIRIE LIGHTS POWER GP INC.



Submitted to
IMPACT ASSESSMENT AGENCY OF CANADA

DOCUMENT COMPLETED BY



McCallum Environmental Ltd.

November 18, 2019

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List of Acronyms

ACIMS	Alberta Conservation Information Management System
ACO	Aboriginal Consultation Office
ACMSW	Alberta Culture, Multiculturalism and Status of Women
AEP	Alberta Environment & Parks (formerly ESRD)
AMD	Air Monitoring Directive
AQA	Air Quality Assessment
AUC	Alberta Utilities Commission
BMP	Best Management Practice
CANFOR	Canadian Forest Products Ltd.
CCIR	Carbon Competitiveness Incentive Regulation
CEAA	Canadian Environmental Assessment Act
CEMS	Continuous Emissions Monitoring
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
DLN	Dry Low NOx
dBA	A-weighted decibels
EEA	Environmental Effects Assessment
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
GIS	Geographic Information System
HR	Historical Resources
HRIA	Historical Resources Impact Assessment
HRSG	Heat Recovery Steam Generator
IBA	Important Bird Area
km	kilometres
kV	kiloVolt
LAT	Landscape Analysis Tool
LP	Low pressure
m	metre

m ³	Cubic metre
MBG	Metres below ground
MEL	McCallum Environmental Ltd.
MW	Megawatt
N	North
NGTL	Nova Gas Transmission
NIA	Noise Impact Assessment
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NAD83	North American Datum of 1983
NE	Northeast
O ₂	Oxygen
OHV	Off Highway vehicle
OSB	Oriented Strand Board
PAZA	Peace Airshed Zone Association
PIP	Participant Involvement Program
PLPGP	Prairie Lights Power GP Inc.
PLPP	Prairie Lights Power Project
PSL	Permissible Sound Level
SAR	Species at Risk
SARA	Species at Risk Act
SCR	Selective Catalytic Reduction
SO ₂	Sulphur Dioxide
STG	Steam Turbine Generator
SW	Southwest
TBD	To Be Determined
TCPL	TransCanada Pipeline Ltd.
TIER	Technology Innovation and Emissions Reduction
TSP	Total Suspended Particulate
UTM	Universal Transverse Mercator
VEC	Valued Ecosystem Components
W6M	West of the sixth meridian

1 GENERAL INFORMATION AND CONTACTS

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

This Project Description has been prepared in accordance with the Canadian Environmental Assessment Agency (CEA Agency) *Guide to Preparing a Description of a Designated Project* under the *Canadian Environmental Assessment Act, 2012* (Updated: March 2015). The numbers and titles used as main headings in the document align with the guide for ease of reference. During the draft review of this document by CEA Agency, the updated *Impact Assessment Act* came into force. The CEA agency advised that the format of the *Guide to Preparing a Description of a Designated Project* could be used for this document. The content of this document meets the information requirements of the new *Information and Management of Time Limit Regulations*, Schedule 1. A Concordance Table is provided in Appendix B.

1.1 NATURE OF PROJECT

Prairie Lights Power GP Inc. ('PLPGP') 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').

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).

Raw source water will be trucked into the site from a pre-existing water source sump used for well fracking / drilling currently owned and operated by Hammerhead Resources Inc. (HHR).

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 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.

1.1.1 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.

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



0 1,000 2,000 4,000 m

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

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



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1.1.1.1 Ancillary Facilities

1.1.1.1.1 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.

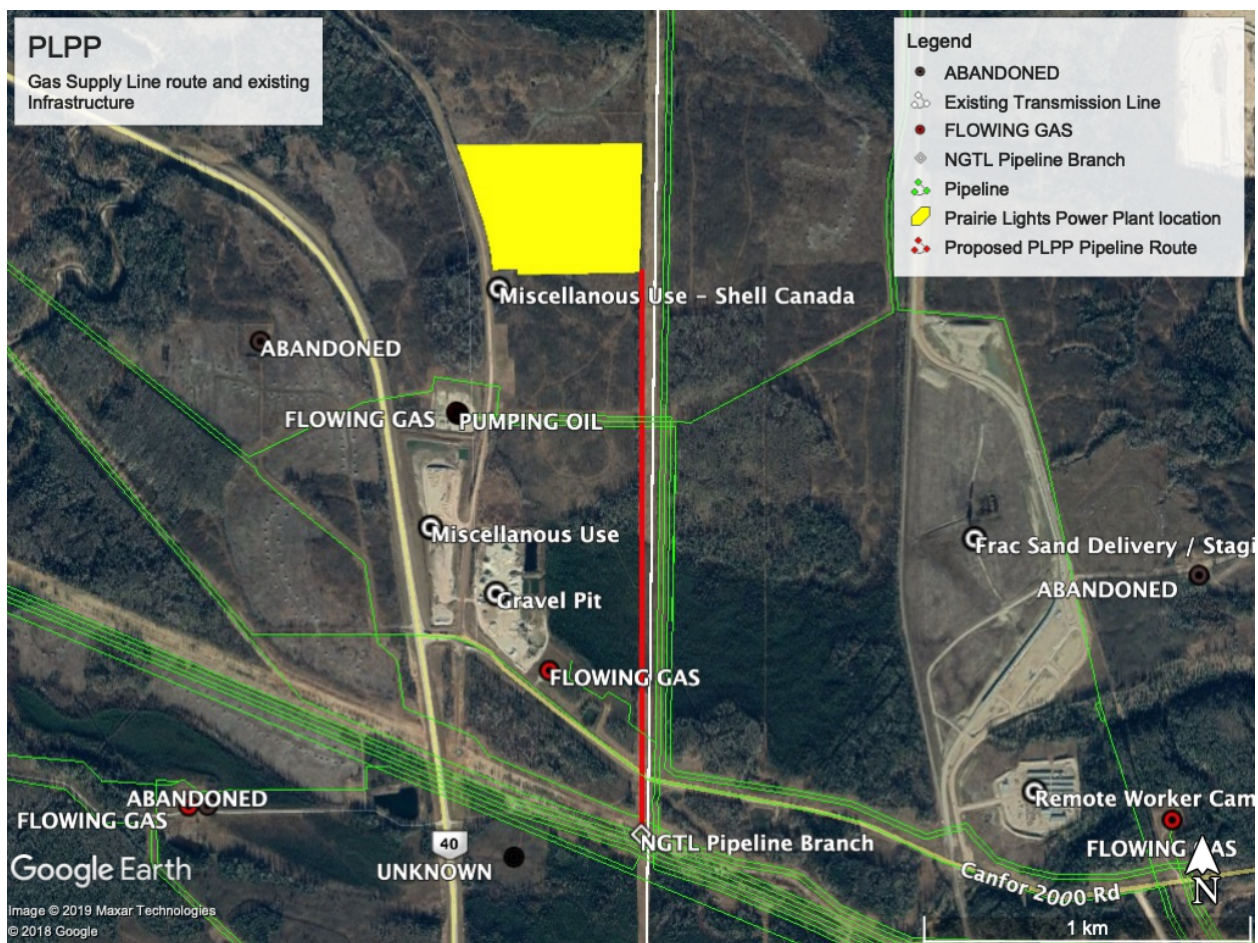


Figure 2. Pipeline route

1.1.1.1.2 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

1.1.2 ALTERNATIVES TO THE PROJECT

1.1.2.1 Project Locations

Alternative locations for the Project site were 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 criteria considered during the evaluation were:

- 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 Electrical System with grid capacity to receive the expected power output from the PLPP

- Proximity to existing natural gas fuel supply

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

1.1.2.2 Project Technology

PLPGP 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.

1.1.2.3 Technical Alternatives to the Project

PLPGP 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 Electrical Grid. 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.

1.1.2.4 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.

1.1.2.5 Transmission Line Options

Three potential Transmission Line ('TL') line routes were selected by desktop analysis and field assessment as potential route options, however only the preferred route will be applied for to the various regulatory agencies. Table 1 provides a summary of the Project route options.

Table 1. 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 (metres)	23,018	18,682	24,747
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.
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Project: Prairie Lights
 Spatial Reference: NAD 1983 UTM Zone 11 U
 Scale: 1 : 65,000

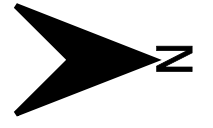













Figure 3. Transmission Line Options

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

1.1.2.5.1 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 be 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.

1.1.2.5.2 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.

1.1.2.5.3 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

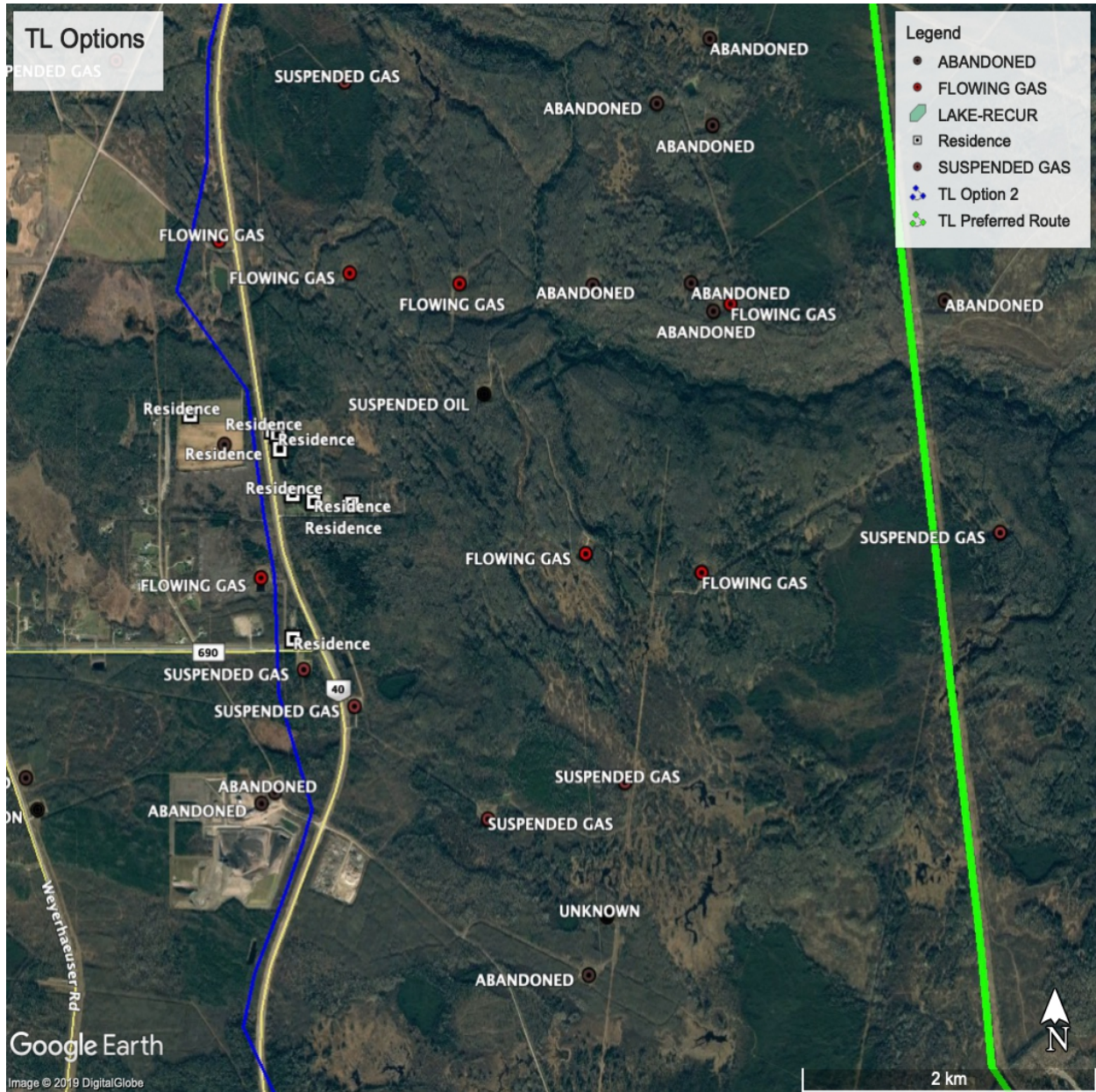


Figure 6. Central portion of transmission line

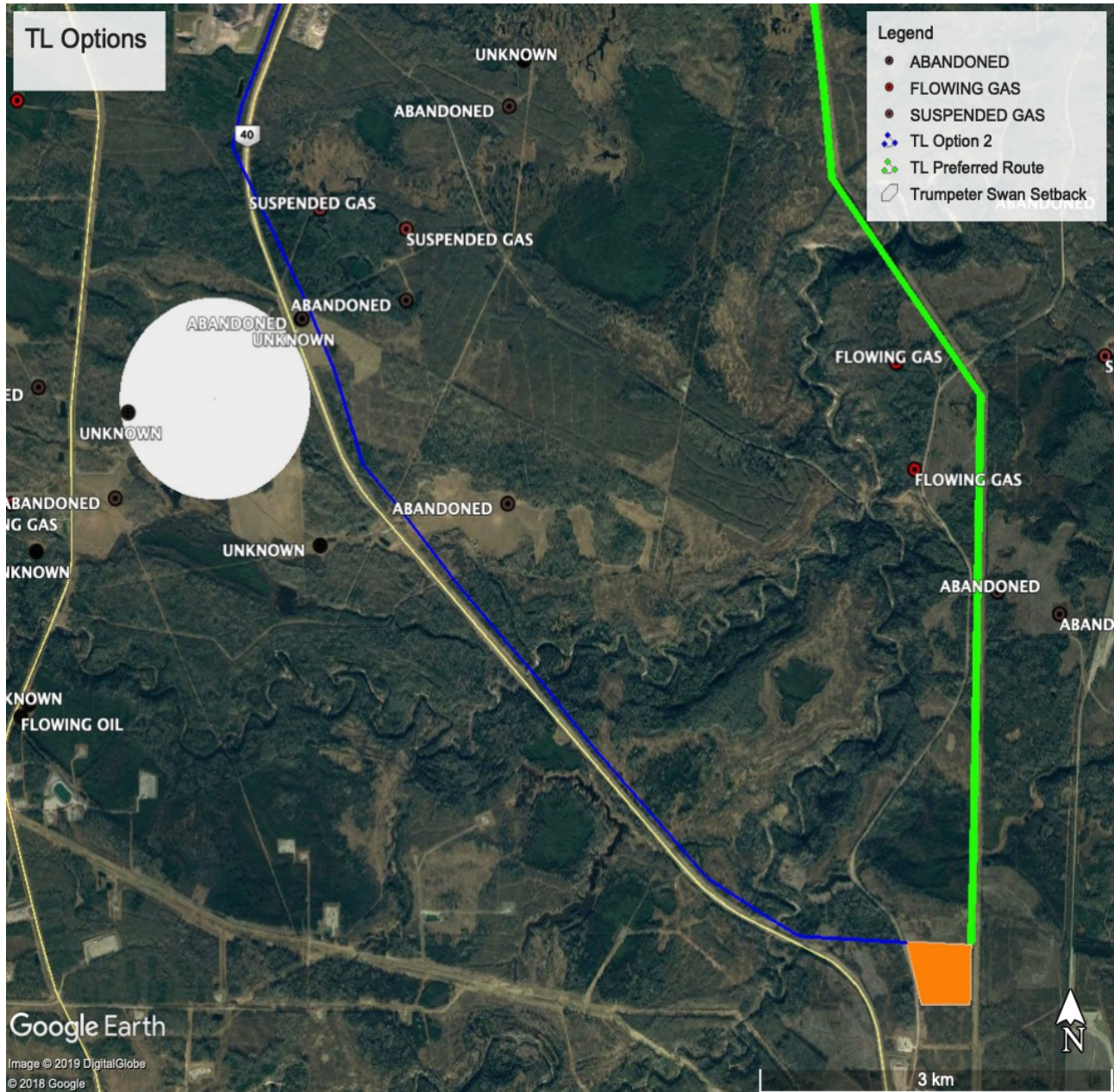


Figure 7. Transmission line from powerplant

1.2 PROPONENT AND CONTACT INFORMATION

Name of the Designated Project	Prairie Lights Power Project
Name of the Proponent	Prairie Lights Power GP Inc.
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

1.3 LIST OF PARTIES AND REGULATORY AGENCIES CONSULTED

The following lists provincial regulatory agencies, municipal agencies, stakeholders, first nations, 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 First Nations

- 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.

1.3.1 ONGOING ENGAGEMENT

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

PLPGP will continue to maintain the relationships it has built with its stakeholders as the Project moves forward, and should the Project be approved, PLPGP 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.

1.4 REGULATORY REQUIREMENTS OF 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 I - 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 PLPGP 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). PLPGP 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. Due to the use of a fresh water source for the Project, an approval under the *Water Act* will be required for water withdrawal from the existing Hammerhead Resources Inc. sump.
- d. 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 first nation consultation.
- e. 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 first nation 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, PLPGP 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. PLPGP 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 requires 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 GP Inc. the approval set out in Appendix 1 – Power Plant Approval 24758-D02-2019 – October 30, 2019. (Refer to Appendix L - AUC Approval & Decision)
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 first nation 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.

1.4.1 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, AUC says 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.

1.5 PREVIOUS REGIONAL ENVIRONMENTAL STUDY

According to the Impact Assessment Act Registry¹ the PLPP is not taking place in an area with a previously completed regional environmental assessment. There is no relevant strategic assessment that is being, or has been, carried out under Section 95 of the *Impact Assessment Act*.

As of September 9, 2019, the AEP Land-use Framework, Regional Plans website² indicated that the Upper Peace Region Land Use Plan has not started the Land Use planning process.

2 PROJECT INFORMATION

2.1 PROPOSED DEVELOPMENT

Prairie Lights Power GP Inc. ('PLPGP') is proposing to permit, construct and operate a 360-Megawatt ('MW') 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 provincial crown land. The Project is known as the Prairie Lights Power Project ('PLPP'). 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 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

¹ <https://www.ceaa.gc.ca/050/evaluations/exploration?culture=en-CA>

² <https://www.landuse.alberta.ca/RegionalPlans/UpperPeaceRegion/Pages/default.aspx>

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 PLPGP.

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 water storage pond used for well fracking / drilling currently owned and operated by Hammerhead Resources (HHR). The existing water storage pond is approximately 13 km east of the PLPP. Under an existing *Water Act* approval, HHR diverts water from the Smoky River at NE 31-067-04W6M. A water pipeline provides water to a HHR water storage pond at SW 35-067-04W6M.

PLPP will acquire an AEP *Water Act* license to receive source freshwater from the HHR point of water diversion on the Smoky River at NE 31-067-04W6M. The *Water Act* licence will stipulate that the point of use for the PLPP will be from the HHR water storage reservoir location SW 35-067-04W6M. Therefore, PLPP will be permitted for water withdrawal from the Smoky River but will not be required to install any infrastructure for that water withdrawal from the Smoky River

and will rely upon the existing withdrawal infrastructure already in place and will take the water from the water storage pond.

Water use volumes are currently estimated at $32.8 \text{ m}^3 / \text{day} = 11,984 \text{ m}^3 / \text{year}$. 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 $11.2 \text{ m}^3 / \text{day}$.

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. No determination on the preferred and alternate routes has been decided at this time.

2.2 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.

PLPGP is therefore required to submit a project description to the CEA 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.

2.3 COMPONENTS AND ACTIVITIES

2.3.1 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.

2.3.1.1 *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 C - Survey Plan)

2.3.1.2 *Buildings and Enclosures*

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

Table 2. 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

2.3.1.3 *Equipment*

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

Table 3. 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

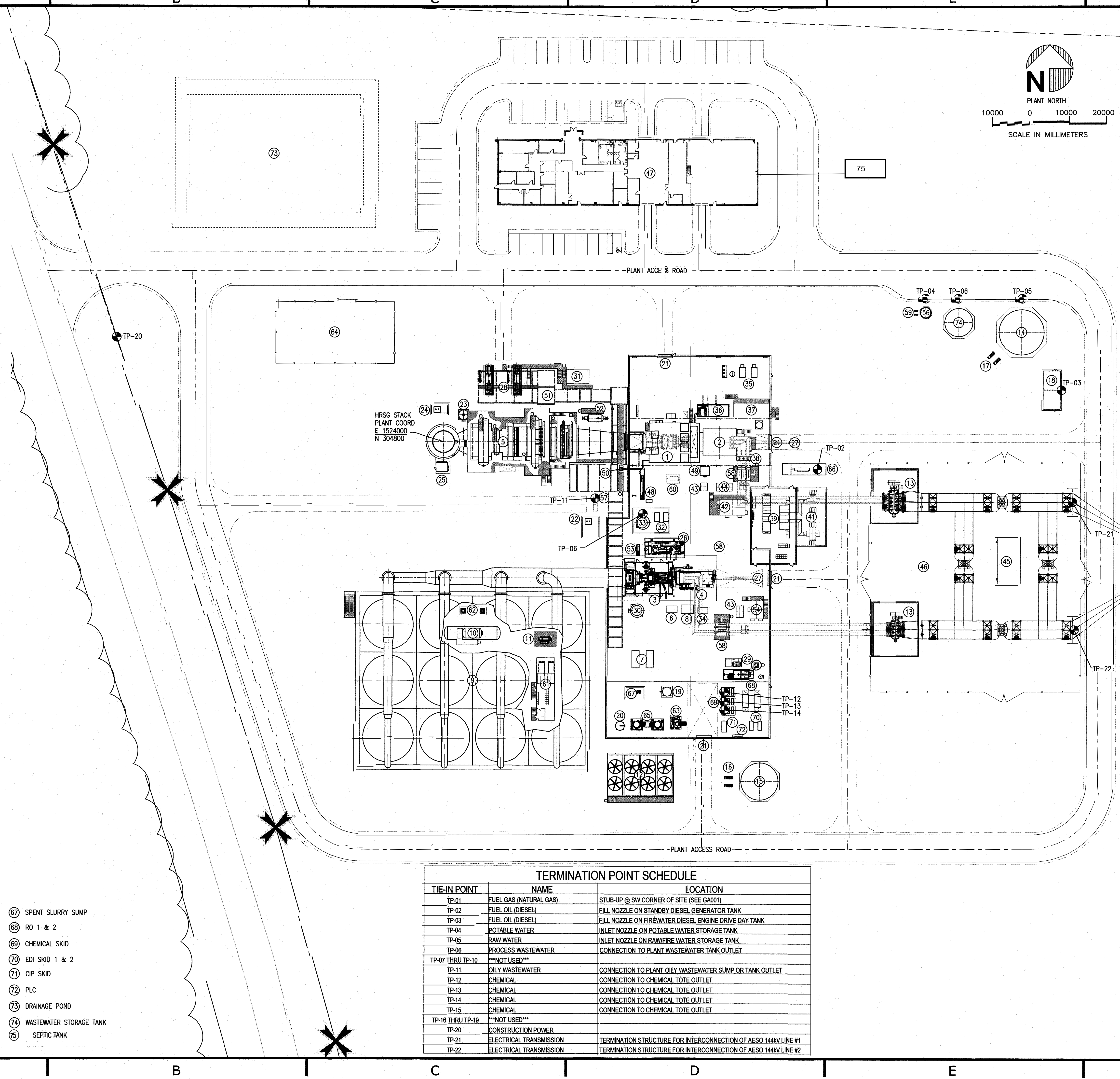
Major Equipment	Installed
Condensate Polisher	2
Diesel Generator	1
Fuel Gas Filter/Separator	2
Fuel Gas Knockout Drum	1
Fuel Gas Performance Heater	1
Heat Recovery Steam Generator	1
Pumps, typically	2
Tanks, typically	1
Service/Instrument Air Compressor	2
Steam Jet Air Ejectors	3
Steam Turbine Generator	1

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

2.3.1.4 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.

- 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:

Figure 8. General Equipment Arrangement

ORIGINAL

PRELIMINARY
NOT FOR CONSTRUCTION

ISSUED FOR REVIEW
4/5/19

ISSUED FOR REVIEW
3/26/19

ISSUED FOR REVIEW
3/20/19

ISSUED FOR REVIEW
1/31/19

TERMINATION POINT SCHEDULE		
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

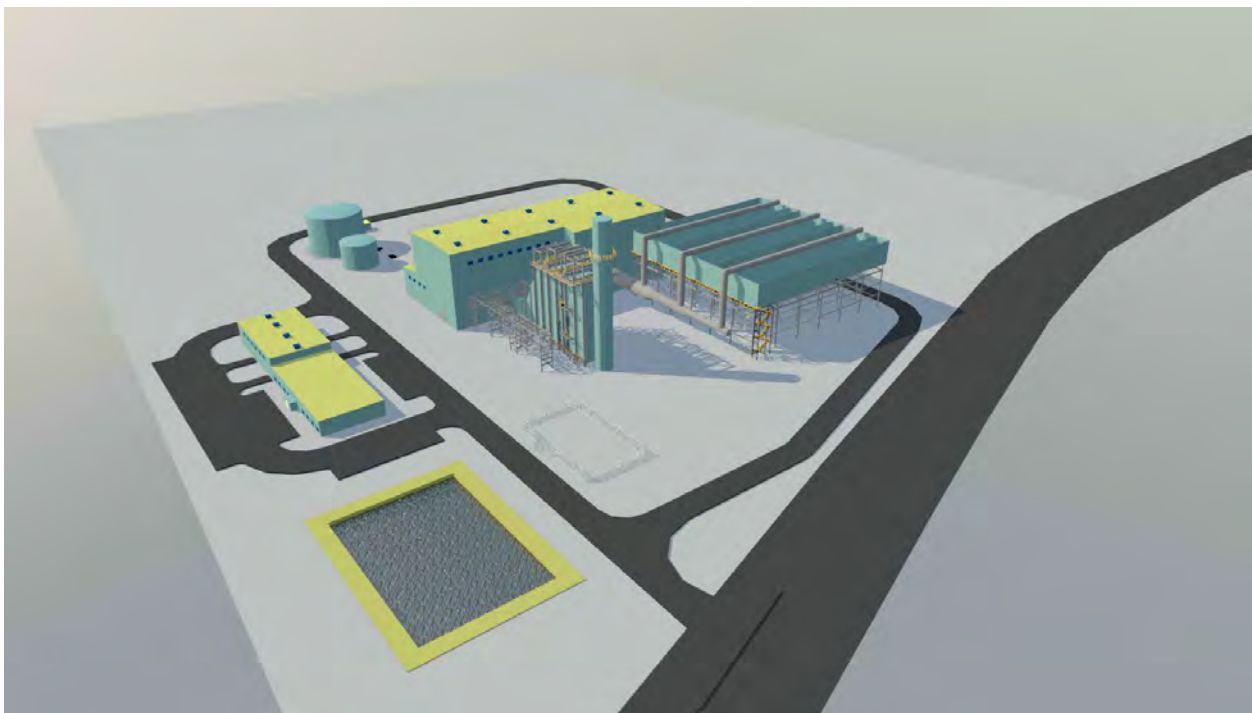
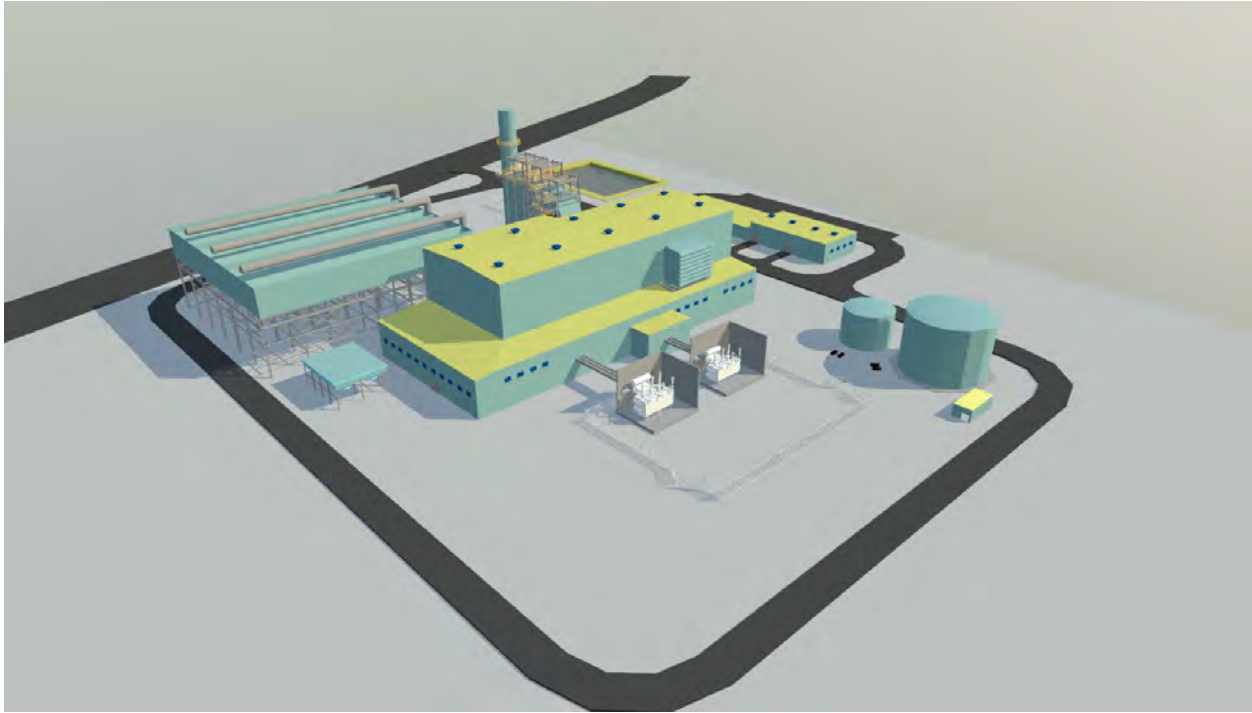
SCALE: 1:500
THIS DRAWING IS THE PROPERTY OF SNC-LAVALIN INC. AND IS NOT TO BE USED IN ANY WAY INJURIOUS TO THEIR INTERESTS AND IS TO BE RETURNED UPON REQUEST.

PRAIRIE LIGHTS POWER PROJECT
GRANDE PRAIRIE, ALBERTA CANADA
GENERAL ARRANGEMENT
DWG. 662981 GA002-S001

REVISION DATE BY CHECKED APPROVED PROJ. TECH. D.R. TECH. PROJ. MGR. INST. MECH. STRUCT. PIPING PROCESS ELEC.

Figure 9. 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.



2.3.1.5 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 PLPGP.

2.3.1.6 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 C - Survey Plan.

2.3.2 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.

2.3.3 PROJECT EXPANSION

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

2.3.4 DESCRIPTION OF PHYSICAL ACTIVITIES INCIDENTAL TO THE PROJECT

Activities that are incidental to the Project's construction and operation, and outside of PLPGP'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 PLPGP will pay a road usage fee for continued use of the road. Other than this expected payment, there are no contractual relationships between PLPGP 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, PLPGP 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.

2.4 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.

2.4.1 AIR

2.4.1.1 Operations

PLPGP has completed an Air Quality Assessment (AQA) for the PLPP. The AQA has been prepared to support PLPGP's Industrial Approval Application and is provided in Appendix G. 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 4. 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.

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 PLPP approval conditions. A data acquisition and report generating system (DARS) will also be provided.

PLPGP 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.³

2.4.1.2 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 commitment⁴. 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

2.4.1.3 Construction and Reclamation

Construction and reclamation operations activities can affect air quality by producing dust and fugitive emissions (i.e., tailpipe exhaust emitting CO₂ and nitrous and sulphur oxides) mainly due to heavy machinery use and transportation. Fugitive 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.

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.

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

⁴ Canadian Association of Petroleum Producers. 2007. Best Management Practice. Management of Fugitive Emissions at Upstream Oil and Gas Facilities.

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 7.1.1⁵ assumptions, were inputted into the model for analysis. Table 5 summarizes the expected construction-related emissions, with maximum daily estimates based on all equipment in use for the full workday.

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⁵ 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.

Table 5. Emissions Estimates

				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (Metric Units)	ROG (kg/day)	CO (kg/day)	NO _x (kg/day)	PM10 (kg/day)	PM10 (kg/day)	PM10 (kg/day)	PM2.5 (kg/day)	PM2.5 (kg/day)	PM2.5 (kg/day)	CO ₂ (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 (megagrams/constru ction 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									
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 PM2.5) 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.

2.4.1.4 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 6. 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.⁶⁷

⁶ 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.

⁷ 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/snpsht/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)⁸, 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.

2.4.1.4.1 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 Carbon Dioxide Emission Intensity for the PLPP. The assessment is provided in Appendix G but summarized below.

⁸ <https://www.cer-rec.gc.ca/nrg/sttstc/lctrct/rprt/2017cndrnwblpwr/ghgmssn-eng.html?=&wbdisable=true>

2.4.1.4.1.1 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 7 below 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 7. 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.

2.4.1.4.1.2 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 8, 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 8. 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

2.4.2 NOISE

PLPGP has completed a Noise Impact Assessment (“NIA”) for the Power Project. The NIA has been prepared to support PLPGP'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. 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.

2.4.3 SURFACE RUNOFF

The purpose of the stormwater 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*. Stormwater 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 be trucked out to a 3rd party certified wastewater disposal/treatment facility.

2.4.3.1 Stormwater 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. PLPGP 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.

2.4.4 INDUSTRIAL WASTEWATER DISPOSAL

No industrial wastewater will be released to the environment. 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.

2.4.5 DOMESTIC SEWAGE

Sewage will be generated during construction, operations and reclamation of the Project. Construction and reclamation sewage will be managed in portable toilets operated by a commercial vendor. 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 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*. No septic field will be constructed.

The septic system will be designed for estimated peak demand domestic wastewater volume. The estimated daily flow for this type of facility is 1200 liters/day.

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.

2.4.6 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.

2.4.7 OPERATIONAL WASTE

Table 9. 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.
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.

Substance	Characterization	Source of introduction	Volume variation	Management / Disposal
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.

2.5 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 10. 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
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

TASK	DATE
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
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

TASK	DATE
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

2.5.1 SITE PREPARATION⁹

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.

⁹ 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.

- 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.
- If soft subgrade conditions persist in any areas during filling or site subgrade preparation the compaction recommendations and proposed construction procedures will be reviewed.
- PLPGP 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.

2.5.2 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 11. 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

Phase	Details
	<ul style="list-style-type: none"> • 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.
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

2.5.3 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.

2.5.4 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.

3 PROJECT LOCATION

3.1 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.

3.1.1 SITE MAPS

Please refer to:

- Figure 1. PLPP Location
- Figure 10. 2018 Aerial photo of PLPP
- Figure 12. Grizzly Bear and Trumpeter Swan Habitats
- Figure 13. Parks and Recreational Areas
- Figure 14. Indigenous Reserves
- Figure 15. Wetlands and Watercourses

3.1.2 SITE PLAN

Please refer to Figure 8; and Figure 9.

3.1.3 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.

3.1.4 PROJECT PROXIMITY

3.1.4.1 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 E - Consultation Program for further information and figures.

3.1.4.2 Indigenous Groups Traditional Territories

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

3.1.4.3 Indigenous Reserves and Metis Settlements

Please refer to Figure 14 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

3.1.4.4 Federal Protected Areas

No federal protected areas are located within 130 km of the PLPP. (Figure 13)

3.1.4.5 National Parks

The closest national park is Jasper National Park, located approximately 130 km south of the Project. Please refer to Figure 13.

3.2 LAND AND WATER 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 10 - 2018 Aerial photo of PLPP accurately represents site conditions.



Figure 10. 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.

Based on the lack of information received from Indigenous groups to date following initial consultation, the Project Area does not appear to have resources currently used for traditional purposes by Indigenous peoples. Engagement with the three First Nations 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 and the Project Summary have been sent to the other various IGs informing them of the Project (refer to Section 6). PLPGP 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 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.

3.3 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 persons¹⁰. Between 2013 – 2018, the MD 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 \$76,787,405.¹¹

¹⁰ MD of Greenview. Review the Business Climate. Online.
<https://expandyourvision.ecdev.org/business-climate>

¹¹ MD of Greenview No. 16 Financial Statements for the year ended December 31, 2017.

3.3.1 PROJECT ACTIVITIES AND SOCIO-ECONOMIC CONDITIONS INTERACTIONS AND EFFECTS

The Project has three distinct phases with specific project activities.

Table 12. 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.

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.

4 FEDERAL INVOLVEMENT

4.1 FEDERAL FINANCIAL SUPPORT

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

4.2 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.

4.3 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.

5 ENVIRONMENTAL EFFECTS

On September 18 and 19th, 2018 a site assessment of the Project lands was completed by Robert McCallum, P.Biol. The following is a 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. On June 10, 2019 additional assessments were completed for vegetation by Clint Gellrich, P.Biol.

5.1 PHYSICAL AND BIOLOGICAL SETTING

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.
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.
8. Review of aerial photos and online maps and government data sources for the general project region.

5.1.1 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.

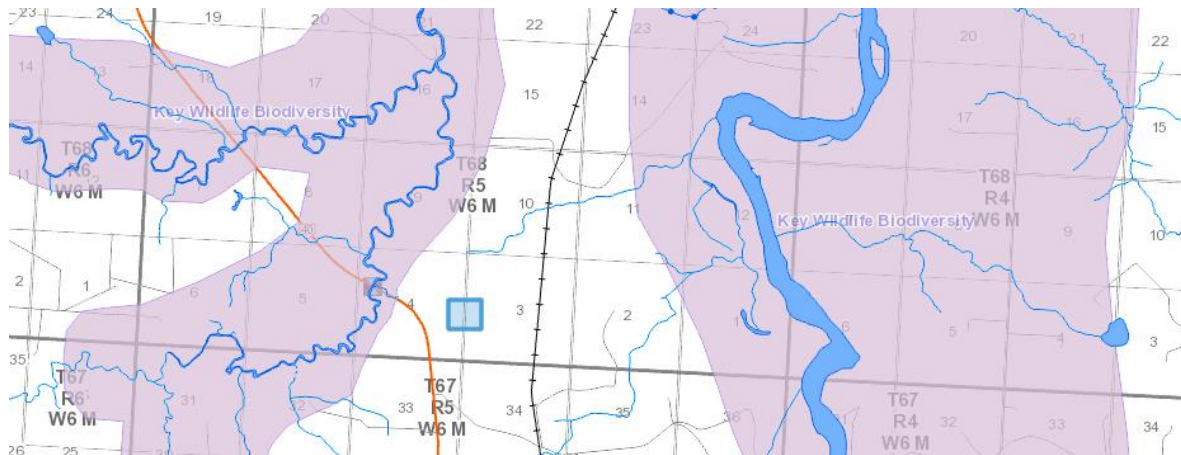
A copy of the search results is provided in Appendix H - ACIMS Data Search Results.

5.1.2 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 11. FWIMT Database search results¹²



5.1.3 LAT REPORT¹³

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 D - LAT Report.

¹²FWMIT 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.

¹³ <https://www.alberta.ca/lat-overview.aspx>

5.1.4 PROVINCIAL PROTECTED AREAS

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

5.1.5 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.¹⁴

The next closest recreation area is the Musreau Lake Recreation Area, located approximately 33 km south of the Project. (Figure 13)

5.1.6 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).

¹⁴ <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.

5.1.7 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).

5.1.8 SENSITIVE SPECIES¹⁵

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

5.1.8.1 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.

5.1.8.2 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

¹⁵ AEP Website. Wildlife Sensitivity Maps – October 2016. <http://aep.alberta.ca/forms-maps-services/maps/wildlife-sensitivity-maps/default.aspx>

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.

5.1.9 SENSITIVE SPECIES WITH POTENTIAL TO OCCUR

The following table (Table 13) 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 13. 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 ¹⁶	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

¹⁶ 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 ¹⁶	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 ¹⁶	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 ¹⁶	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 PLPGP.	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 ¹⁶	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 PLPGP.	Low due to lack of habitat
Mammals	<i>Lynx rufus</i>	Bobcat	Sensitive	None	No	None	Perhaps fewer than 1 000 individuals. PLPGP 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 ¹⁶	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. PLPGP 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 PLPGP 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 ¹⁶	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 ¹⁶	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

5.1.10 AIR QUALITY

The contaminant of concern from the emission sources is 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}). Air quality modelling has been completed to assess the potential air quality effects of the PLPP on the surrounding environment. 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 this 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 gas turbine generator engine 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 AQA determined cumulative maximum CO, NO₂, and PM_{2.5} concentrations resulting from the PLPP, including external industrial emission sources and ambient background, were predicted to be less than their corresponding AAAQOs for all relevant averaging periods.

Table 14. 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

5.1.10.1 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 Carbon Dioxide Emission Intensity for the PLPP. The assessment is provided in Appendix G but summarized below.

5.1.10.2 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 15 below 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 15. 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 concentration	1.02	28.7	0.2

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

5.1.10.3 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 16, 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 units of more than 150 MW.

Table 16. Carbon Dioxide Emissions Intensity

Natural Gas Flow Rate (kg/hr)	Total Carbon content (%)	CO₂ (tonnes/hour)	Gross Power output (GW)	Emissions intensity (tonnes/GWh)	Limit (tonnes/GWh)
48,581	73.4	143.2	0.360	398	420

5.1.10.4 Monitoring

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 to ensure that emissions levels do not exceed acceptable levels. 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.

5.1.10.5 Mitigation

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 startup.

As previously stated in Section 2.4.1., 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 CO_{2e} per megawatt-hour of power produced. Based on these regulations, allowable CO_{2e} 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.

5.1.11 VEGETATION

Vegetation surveys were completed within the Project footprint. The PLPP lies in a clearcut 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 clearcut. Assessment of percent of areas covered by weed species revealed less than 5% invasion at all assessment areas in forested areas.

Table 17. 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 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

Common Name	Scientific Name	2015 Alberta Rank	Origin
Fringed Brome	<i>Bromus ciliatus</i>	S5	Native
Timothy	<i>Pleum pratense</i>	S5	Native
Bebb's Willow	<i>Salix bebbiana</i>	S5	Native

5.1.11.1 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 weeds¹⁷ may be expected on disturbed soils until re-seeded vegetation becomes established.

5.1.11.2 Mitigation

PLPGP will re-seed all soil storage areas to limit the spread of weeds onto disturbed soils. PLPGP 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.

PLPGP will take the following approach to vegetation management:

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

5.1.12 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.¹⁸

¹⁷ As listed in the Alberta Weed Control Regulations, 19/2010.

¹⁸ 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

- 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.
 - 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.

5.1.12.1 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

provided to support construction and the Industrial Approval application but is not provided in this Project Description.

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.

5.1.12.2 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 J) 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 2.5 (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.

5.1.13 GROUNDWATER

A relatively deep groundwater table is considered typical in this area¹⁹. 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.

5.1.13.1 Mitigation

¹⁹ 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.

This section describes standard mitigation measures designed to reduce or avoid interactions with hydrogeology during construction, operation, and reclamation activities, thereby mitigating potential effects.

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.
- Other potential accidental or acute interactions with the groundwater system will be mitigated through the following measures:

- 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. The groundwater monitoring network would be designed to provide adequate characterization of background groundwater quality in upgradient areas, and ongoing characterization of groundwater quality in areas downgradient of potential sources of contamination.
- 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.

5.1.13.2 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 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

5.1.14 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.

5.1.14.1 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, cutblocks, pipelines, and wellsites.

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.

5.1.14.1.1 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*)

5.1.14.1.2 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.

5.1.14.1.3 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.

5.1.14.1.4 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*)

5.1.14.2 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 clearcut where the PLPP will be placed, it is highly unlikely that further significant loss of wildlife use of the PLPP lands will occur.

5.1.14.3 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:

- PLPGP 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.
- PLPGP 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 (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 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.

5.1.15 SURFACE HYDROLOGY

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

5.1.15.1 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 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.

5.1.15.2 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 15. Wetlands and Watercourses.

5.1.15.3 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 15. Wetlands and Watercourses.

5.1.15.4 Effects of the Project

Due to the distance between the PLPP and watercourses or wetlands, no effects from the PLPP are expected.

Surface runoff will be managed as per the requirements of the Alberta Industrial Approval; therefore, no effects are expected.

5.1.16 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 18 (below).

Table 18. Valued Ecosystem Component Effects Table

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects
Habitat	Forested Habitat	<ul style="list-style-type: none"> • 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 implemented, where required, to manage the risk of spills of fuels, lubricants and other construction 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 	<ul style="list-style-type: none"> • Effects to quality not expected as secondary containment and spill response procedures will be implemented. Alberta Environment may request groundwater monitoring during operations to ensure no effects.

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects
			<p>scheduling such that the amount of time over which dewatering is required is minimized.</p> <ul style="list-style-type: none"> 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 process liquids or wastes to be released into the subsurface. A spill prevention and response plan will be implemented for the Project, such that incidental spills are quickly identified, reported, and remediated. 	<ul style="list-style-type: none"> Effects to quantity will be limited in duration and recharge of groundwater following dewatering not expected to result in residual effects.
	<p>Surface Runoff</p>	<p>Movement of sediment and potential surface contaminants into surface water collection pond.</p>	<ul style="list-style-type: none"> 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 	<p>None</p>

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects
			<p>where the discharge will be distributed over the natural ground and will meet provincial discharge criteria prior to release.</p> <ul style="list-style-type: none"> Any runoff that does not meet criteria (as indicated in report) will be disposed at an approved facility. 	
<p>Wildlife</p>	<p>Birds Ungulates Mammals</p>	<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. 	<ul style="list-style-type: none"> Residual effects of vehicle collisions would be limited due to limited occurrences. Residual effects of bird mortality from transmission line would likely be limited as existing transmission line adjacent to proposed route. None expected following reclamation of the Project.

Valued Ecosystem Components (VECs) Category	Valued Ecosystem Components (VECs)	Description of Impacts	Mitigation	Residual Effects
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. • Weed control will be implemented 	None
Watercourses	Watercourse	None as no watercourses affected.	N/A	None
Wetlands	All Classes, All Types	None as no wetlands affected.	N/A	None

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

5.2.1 FISH AND FISH HABITAT

Raw source water will be trucked 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 will be obtained 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. Additional water withdrawal requirements will require approval by AEP under the *Water Act*, and possibly Fisheries and Oceans Canada. However, no new infrastructure will be required at the Smoky River and there will be no direct effects to fish or fish habitat other than water withdrawal.

Daily water withdrawal from the existing source location on the Smoky River for the PLPP is estimated at 32.8 m³ / day. Unfortunately, there are no active hydrometric stations near the proposed water withdrawal point, however, the monthly flow rate for the Smoky River at Watino (Hydrometric station 07GJ001)²⁰, located approximately 150 km downstream, indicates the lowest flow rates occurring in December. In December 2015 (most recent data), the monthly flow rate was 44.7 m³/s. 48 km upstream at the Kakwa River at Highway No. 40 (Hydrometric Station 07GB003)²¹, the monthly flow rate in December 2015 was 14.7 m³/s. At 32.8 m³/day, the PLPP would only withdrawal 0.00038 m³/s. Using the Kakwa river low flow rate of 14.7 m³/s, the PLPP withdrawal would be 0.0026% of the volume. Finally, to put the proposed withdrawal of 32.8 m³/day in perspective, the current water licence issued by AEP to HHR allows for 2700 m³ of water withdrawal daily from the Smoky River during the lowest flow events on the river, which typically occur in December. Therefore, the PLPP would only be 1.2% of this allowable daily amount. Therefore, given the flow volumes recorded, the effects of water withdrawal from the PLPP would be insignificant and would no measurable effect on fish or fish habitat.

All Project activities will be confined to the Project Area. No activities are planned in or

20

https://wateroffice.ec.gc.ca/report/historical_e.html?stn=07GJ001&dataType=Monthly¶meterType=Flow&year=2015&mode=Graph&y1Max=1&y1Min=1

21

https://wateroffice.ec.gc.ca/report/historical_e.html?stn=07GB003&dataType=Monthly¶meterType=Flow&year=2015&mode=Graph&y1Max=1&y1Min=1

near the Smoky River or Big Mountain Creek. According to 2019 Alberta Guide to Sportfishing, Zone 1 Eastern Slopes – ES4²², Big Mountain Creek may contain Bull Trout (*Salvelinus confluentus*), other trout species, and Mountain Whitefish (*Prosopium williamsoni*). The Project will not have other indirect interaction with fish or fish habitat.

All surface water from the PLPP area will be collected in the stormwater 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 these standards will be pumped into a truck for disposal at an approved disposal site.

5.2.2 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.

5.2.3 MIGRATORY BIRDS

The PLPP lands have limited potential to support tree nesting migratory birds as the project was recently clearcut. 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).

²² <https://albertaregulations.ca/fishingregs/es4.html>

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 stormwater 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 stormwater pond. However, PLPGP 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 stormwater 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 stormwater pond is not expected to adversely affect migratory birds.

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.

5.3 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 13. Provincial Parks and Recreational Areas.

The closest first nation 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.

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

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.

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.

5.4.1 USE OF LANDS

5.4.1.1 *Hunting*

To date no Indigenous groups have expressed concerns as a result of the PLPP. This would suggest there is limited to no use by Indigenous groups. Additionally, 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 overstory 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.

5.4.1.2 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 clearcut 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.

The gas pipeline and electrical transmission line may encounter traditional use areas associated with traditional use of plants, however during construction only the overstory 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.

5.4.1.3 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.

5.4.1.4 Trapping

During consultation associated with the PLPP, registered trappers were notified. No concerns from active trappers were raised. No active traplines 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.

5.4.1.5 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.

5.4.1.6 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.

5.4.1.7 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.

5.5 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 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 Listing provides proponents with advance notification of possible historic resource concerns and may be used as a tool in planning projects. 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 *Historical Resources Act*. 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.”²³

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. That review is still in process.

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).

The minimal effects on the environment are expected to have negligible effects on Indigenous peoples, including effects to health and socio-economic conditions, physical and cultural heritage, any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance, and the current use of the land and resources for traditional purposes (current use).

Furthermore, the PLPP initiated consultation as required by the ACO and the Impact Assessment Agency and no concerns were expressed by any of the first nations or Métis. Further consultation will continue during licencing and permitting of the transmission line and the pipeline. If further or potential effects are identified, or the first nations or Métis require or request further consultation and/or engagement, PLPGP will continue the consultation and/or engagement processes. See the following Section 6 for further information.

²³ Listing of Historic Resources. 2019. <https://www.alberta.ca/listing-historic-resources.aspx>

6 ENGAGEMENT WITH INDIGENOUS GROUPS

6.1 ABORIGINAL CONSULTATION OFFICE REQUIREMENTS

PLPGP 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 First Nations up to 15 Government of Alberta working days to respond to the project notification. If any First Nations 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 First Nation has not responded to the project notification within that time, PLPGP, after providing First Nations with 5 working days to review the consultation record, may ask the ACO to review the consultation record for adequacy.

6.1.1 LIST OF POTENTIALLY AFFECTED AND INTERESTED INDIGENOUS GROUPS

In accordance with Alberta's First Nations and Métis Settlements policies and guidelines (<http://indigenous.alberta.ca/1.cfm>), the Alberta Aboriginal Consultation Office (ACO) indicated that the PLPGP is located within the traditional territories of the:

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

6.2 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 First Nations

- 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

6.3 DESCRIPTION OF ENGAGEMENT ACTIVITIES CARRIED OUT TO DATE

The Proponent sent information packages to the three identified Indigenous groups. PLPGP 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 F. Gift Lake Metis, Horse Lake, and Sucker Creek representatives reviewed and visited the Project location.

Further consultation will be completed for both the transmission line and the gas pipeline following the same regulatory processes and requirements.

In October 2019, PLPGP sent information packages 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). The following summarizes actions and results to date:

- Driftpile First Nation - sent package twice – PLPGP will continue to engage
- Duncan First Nation - sent package twice – PLPGP will continue to engage
- Horse Lake First Nation: previously consulted on – letter of low concern given
- Kapawen’o/Sawridge – consultation / engagement ongoing
- Sturgeon Lake Cree Nation – consultation / engagement ongoing
- Sucker Creek First Nation - previously consulted on – letter of low concern given
- Swan River First Nation: sent package twice – PLPGP will continue to engage
- East Prairie Metis: consultation / engagement ongoing

- Metis Nation of Alberta: consultation / engagement ongoing
- Aseniwuche Winewak Nation: PLPGP will continue to engage
- Foothills Ojibway First Nation: consultation / engagement ongoing
- All of the Kelly Lake group(s): consultation / engagement ongoing
- Foothills Ojibway First Nation: consultation / engagement ongoing

6.4 COMMENTS OR CONCERNS OF INDIGENOUS GROUPS

No specific concerns from Indigenous groups related to the proposed Project have been received to date. Additionally, three groups that have visited the Project location (Gift Lake, Horse Lake, Sucker Creek) and have no concerns with the Project or its location.

6.5 FURTHER CONSULTATION AND INFORMATION GATHERING PLAN

PLPGP plans to continue to engage the aforementioned IGs (or others as directed by the ACO) in 2019 / 2020 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.

PLPGP is committed to keeping consultation with IGs and all affected stakeholders ongoing. PLPGP'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, PLPGP will continue to engage through construction and operation of the Project, as PLPGP believes this will result in a better Project and long-term involvement in the region.

7 CONSULTATION WITH THE PUBLIC OR OTHER PARTIES

As per AUC Rule 007 requirements, a Participant Involvement Program (PIP) was undertaken by PLPGP (Appendix E - 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, first nations and industrial interest holders who may potentially be impacted by the PLPP.

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

PLPGP 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

7.1 OVERVIEW OF KEY COMMENTS AND CONCERNS EXPRESSED BY STAKEHOLDERS

To date, no questions or concerns have been raised by any stakeholders notified.

7.2 OVERVIEW OF ONGOING CONSULTATION ACTIVITIES

PLPGP 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.

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

PLPGP 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.

7.3 CONSULTATION WITH OTHER JURISDICTIONS

Refer to Section 1.3 for a description of engagement with other regulatory jurisdictions.

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Appendix A - Additional Figures

Figure 12. Grizzly Bear and Trumpeter Swan Habitats

Figure 13. Parks and Recreational Areas




Figure 14. Indigenous Reserves and Settlements

Figure 15. Wetlands and Watercourses

Prepared For:
Prairie Lights Power GP

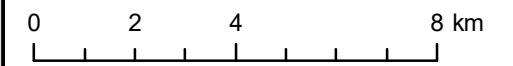
FIGURE 12

**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



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

Drawn By: LP

Date: 2019-07-17



McCallum Environmental Ltd.

Prepared For:
Prairie Lights Power GP Inc.

FIGURE 13

**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



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

Drawn By: LP Date: 2019-07-18



McCallum Environmental Ltd.

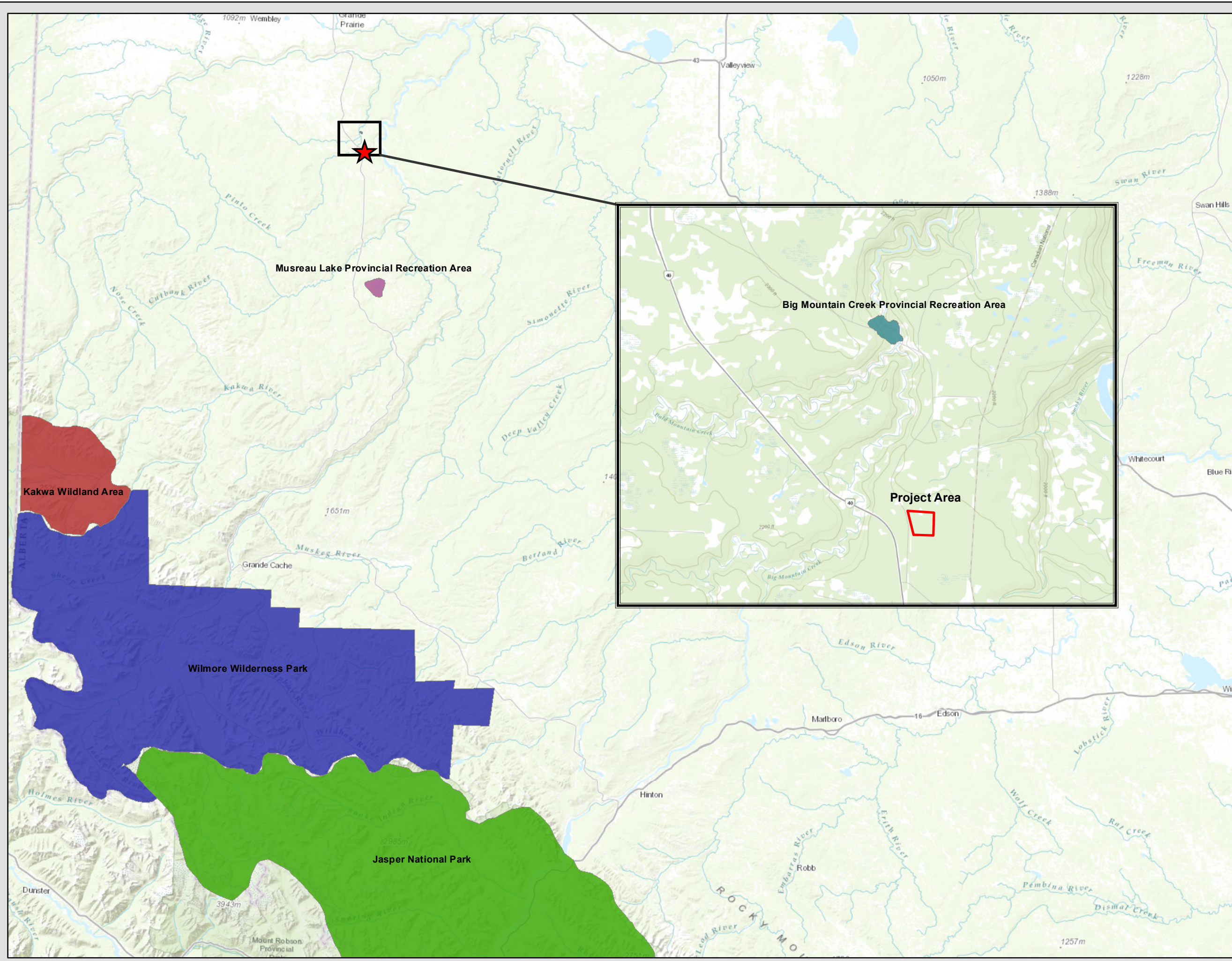




FIGURE 14

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

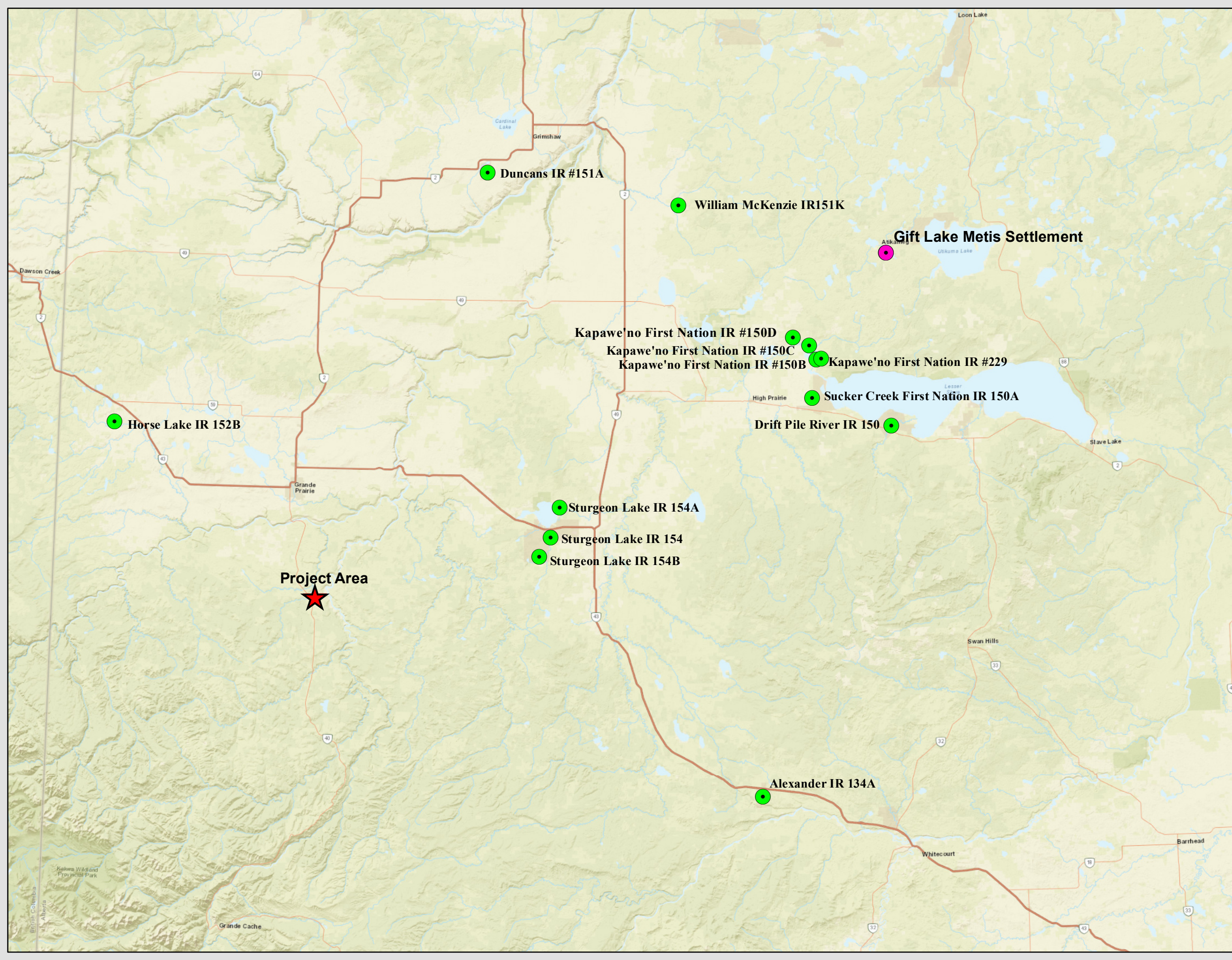
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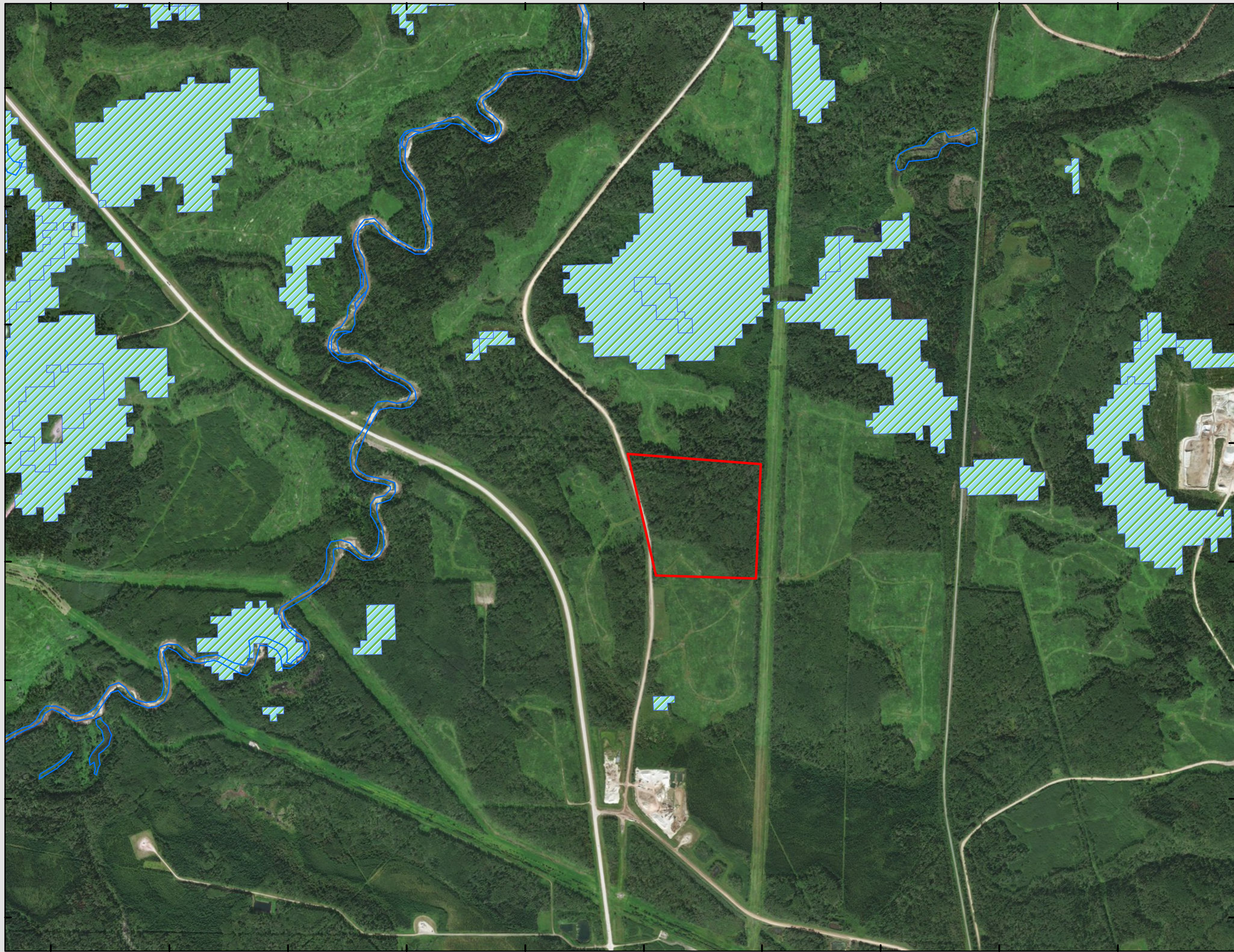
Drawn By: LP

Date: 2019-09-11



McCallum Environmental Ltd.








Prepared For:

Prairie Lights Power GP

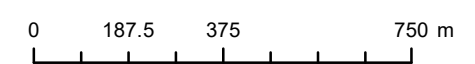
FIGURE 15

**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 1.1.1 Figure 1
2. Proponent's name and contact information and primary representative for the purpose of the description	Section 1.2
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 1.3 Section 6 Section 7
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 1.3 Section 6
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 1.5
6. Any strategic assessment relevant to the project, that is being or has been carried out under Section 95 of the Act.	Section 1.5

*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 1.1 Section 2.1
8. The provisions in the schedule to the Physical Activities Regulations describing the project in whole, or in part.	Section 2.2 Section 2.1
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 2.3 Table 2 Table 3 Figure 8
10. Estimate of the maximum production capacity of the project and a description of the production processes to be used.	Section 2.2
11. The anticipated schedule of construction, operation, decommissioning and abandonment, including any expansion.	Table 10
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 1.1.2 Section 2.1

*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 Location Information	
13. A description of the project location, including:	
a. Its proposed geographic coordinates, 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	Section 1.1.1
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 Appendix B
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 1.1.1
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 3.1.4 Section 3.1.4.2 Section 3.1.4.3 Figure 14
f. The project proximity to federal land.	Section 3.1.4.4 Section 3.1.4.5

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
	Figure 13
14. A description of the physical and biological environment of the project location.	Section 3.1
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 3.3
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 4.1
17. A list of any federal lands that may be used for the purpose of carrying out the project.	Section 4.2
18. A list of any jurisdictions that powers, duties or functions in relation to an assessment of the project’s environmental effects.	Section 4.3
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 5.2.1
b. Aquatic species as per 2(1) of the Species at Risk Act; and,	Section 5.2.2
c. Migratory birds, as per 2(1) of the Migratory Birds Convention Act, 1994.	Section 5.2.3 Section 5.1.14.1.3
20. A list of any changes to the environment that, as a result of the carrying out of the project, may occur	Section 5.3

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
on federal lands, in a province other than the province in which the project is proposed to be carried out.	
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.	Section 5.4
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.	Section 5.4
23. An estimate of the Greenhouse gas emissions associated with the project.	Section 2.4.1 Section 5.1.10
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.	Section 2.4.1 Section 2.4.3 Section 2.4.3.1 Section 2.4.4 Section 2.4.5 Section 2.4.6 Section 2.4.7 Section 5.1.10
Part F - Summary	

*Prairie Lights Power Plant
Concordance Table*

Required Information as described in the Information and Management of Time Limits Regulations, Schedule 1	Project Description Reference
A plain language summary of the information that is required under items 1 to 24 in English and in French.	

THE FOLLOWING APPENDICES HAVE BEEN UPLOADED SEPARATELY

Appendix C - Survey Plan

Appendix D - LAT Report

Appendix E - Consultation Program

Appendix F - Alberta Adequacy Assessment

Appendix G - Air Quality Assessment

Appendix H - ACIMS Data Search Results

Appendix I - AEP Correspondence re. EIA Requirement

Appendix J - Construction Drawing / Grading Drainage Drawing

Appendix K - Equipment List

Appendix L - AUC Approval & Decision