

2017 NGTL System Expansion Project

Project Description

December 2014



Submitted to:
Secretary of the Board
National Energy Board
517 Tenth Avenue SW
Calgary, AB T2R 0A8

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December 15, 2014

National Energy Board
517 Tenth Avenue SW
Calgary, Alberta T2R 0A8

Filed Electronically

Attention: Ms. Sheri Young, Secretary of the Board

Dear Madam:

**Re: NOVA Gas Transmission Ltd. (NGTL)
Project Description for the 2017 NGTL System Expansion Project (Project)**

NGTL, a wholly owned subsidiary of TransCanada PipeLines Limited (TransCanada), proposes to construct and operate new pipeline facilities in Alberta to receive and deliver sweet natural gas as part of the existing NGTL System. The Project is needed to enable NGTL to meet incremental firm service contracts for the receipt and delivery of natural gas in established markets.

The project description (PD) for the 2017 NGTL System Expansion Project is provided under cover of this letter.

The Project will consist of 230 km of pipeline ranging from 610 mm (NPS 24) to 1219 mm (NPS 48) outside diameter (OD) in five separate sections:

- Northwest Mainline Loop – Boundary Lake Section
- Northwest Mainline Loop – Bear Canyon Section
- Grande Prairie Mainline Loop No. 2 – McLeod River Section
- Liege Lateral Loop No. 2 – Pelican Lake Section
- Kettle River Lateral Loop – Christina River Section

The Project will also consist of the following compression facilities:

- Alces River Compressor Station Unit Addition
- Hidden Lake North Compressor Station Unit Addition
- Otter Lake Compressor Station Unit Addition
- Woodenhouse Compressor Station Unit Addition

The proposed in-service dates for the Project are in the second quarter of 2017.

NGTL plans to file an application for a *Certificate of Public Convenience and Necessity* to construct and operate the Project, pursuant to Section 52 of the *National Energy Board Act* (NEB Act) in the first quarter of 2015.

NGTL has initiated and is proceeding with field studies, environmental and socio-economic assessments, engineering design, Aboriginal and stakeholder engagement, regulatory consultation and other activities needed to support the application.

Environmental assessments will be required under both the NEB Act and the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) as the preferred pipeline routes involve more than 40 km of new right-of-way.

The enclosed PD provides a description of the Project consistent with guidance available through the NEB website. It is intended to:

- facilitate an efficient regulatory review of the Project by the Board
- facilitate determination of the scope of the Project, as well as the scope and type of assessment required pursuant to the NEB Act
- provide the Crown with sufficient information to begin consultation with Aboriginal communities that might potentially be affected by the Project
- provide the Board with sufficient information to initiate its Participant Funding Program, Enhanced Aboriginal Engagement and public consultation activities
- inform other regulatory authorities, Aboriginal communities, landowners and stakeholders

Accordingly, in addition to providing the enclosed PD for consideration by the Board, NGTL also requests that the Crown begin any necessary consultation with Aboriginal communities as soon as possible.

Yours truly,
NOVA Gas Transmission Ltd.

Original signed by

Robert Tarvydas
Vice-President, Regulatory Affairs

Enclosures

cc. Distribution List
Director General, MPMO Operations

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1.0 INTRODUCTION

1.1 NAME AND NATURE OF PROJECT

NOVA Gas Transmission Ltd. (NGTL), a wholly owned subsidiary of TransCanada PipeLines Limited (TransCanada), proposes to construct, own and operate new pipeline facilities that will form an integral part of the existing NGTL System. These facilities will consist of:

- Northwest Mainline (NWML) Loop – Boundary Lake Section
- NWML Loop – Bear Canyon Section
- Grande Prairie Mainline (GPML) Loop No. 2 – McLeod River Section
- Liege Lateral Loop No. 2 – Pelican Lake Section
- Kettle River Lateral Loop – Christina River Section
- Alces River Compressor Station Unit Addition
- Hidden Lake North Compressor Station Unit Addition
- Otter Lake Compressor Station Unit Addition
- Woodenhouse Compressor Station Unit Addition

Collectively, these facilities are referred to as the 2017 NGTL System Expansion Project (Project). The Project is required to meet incremental firm service contracts for the receipt and delivery of sweet natural gas and all components of the Project are required to meet the firm service requests. Although the Project components are located in various areas on the NGTL System they form the necessary components of a single system expansion.

1.2 SCOPE AND TIMING

The scope of the Project includes approximately 20 km of 610 mm (NPS 24) outside diameter (OD) pipe, 56 km of 762 mm (NPS 30) OD pipe, 118 km of 914 mm (NPS 36) OD pipe and 36 km of 1219 mm diameter (NPS 48) OD pipeline, four compressor station unit additions and related components, including valve sites.

Pipeline facilities included in the Project:

- **NWML Loop – Boundary Lake Section**
Pipeline loop of approximately 91 km of 914 mm (NPS 36) OD pipe between the Alces River Compressor Station located at 12-13-085-13 W6M and the Owl Lake Meter Station located at 15-0-094-12 W6M, approximately 6 km east of the AB/BC border in Clear Hills County, Alberta (AB). This will be a loop of the existing Northwest Mainline.

- **NWML Loop – Bear Canyon Section**
Pipeline loop of approximately 27 km of 914 mm (NPS 36) OD pipe between the Saddle Hills Compressor Station located at SE 05-079-09 W6M and an existing valve site located at SW 35-080-11 W6M, approximately 32 km northwest of Spirit River, in Saddle Hills County, AB. This will be a loop of the existing Northwest Mainline.
- **GPML Loop No. 2 – McLeod River Section**
Pipeline loop of approximately 36 km of 1219 mm (NPS 48) OD pipe between a tie-in to the Grande Prairie Mainline located at NW 21-055-20 W5M and the existing valve site located at SE 11-53-18 W5M, approximately 5 km west of Edson in Yellowhead County, AB. This will be a loop of the existing Grande Prairie Mainline.
- **Liege Lateral Loop No. 2 – Pelican Lake Section**
Pipeline loop of approximately 56 km of 762 mm OD (NPS 30) pipe between the Buffalo Creek Compressor Station located at SW 19-086-18 W4M and the Pelican Lake Compressor Station located at NE 30-081-16 W4M, approximately 100 km southwest of Fort McMurray, AB. This will be a loop of the existing Liege Lateral and Liege Lateral Loop.
- **Kettle River Lateral Loop – Christina River Section**
Pipeline loop of approximately 20 km of 610 mm OD (NPS 24) pipe between the Leismer Kettle River Crossover located at NW 26-080-06 W4M and the Graham and Graham Loop No. 2 junction located at NW 14-079-05 W4M, approximately 100 km southeast of Fort McMurray, AB. This will be a loop of the existing Kettle River, Bohn Lake and Chard Laterals.

Compressor Stations included in the Project:

- **Alces River Compressor Station Unit Addition**
Addition of a single turbo-compressor unit (gas turbine and compressor) of 15 MW at the site, adjacent to the existing Unit B2 at Alces River Compressor Station, located approximately 156 km northwest of Grande Prairie, AB, located at 12-13-085-13 W6M. The site will include a compressor building, auxiliary buildings and yard piping.
- **Hidden Lake North Compressor Station Unit Addition**
Addition of a single turbo-compressor unit (gas turbine and compressor) of 15 MW at the site, adjacent to the existing Hidden Lake North Compressor Station. The site is located approximately 180 km west of Manning, AB located at 03-32-096-11 W6M. The site will include a compressor building, auxiliary buildings and yard piping.

- **Otter Lake Compressor Station Unit Addition**

Addition of a single turbo-compressor unit (gas turbine and compressor) of 30 MW at the existing Otter Lake Compressor Station. The new unit will be installed at the existing site located 60 km east of Manning, AB, located at 05-08-091-16 W5M. The site will include a compressor building, auxiliary buildings and yard piping.

- **Woodenhouse Compressor Station Unit Addition**

Addition of 30 MW in turbo-compressor unit(s) (gas turbine and compressor) at the site, adjacent to the existing Woodenhouse Compressor Station. The site is located approximately 65 km northwest of Wabasca, AB, located at 07-29-086-01 W5M. The site will include a compressor building, auxiliary buildings and yard piping.

The final scope of the Project may be subject to refinements based on factors including changes to commercial commitments to transportation service, detailed routing, environmental studies and input from stakeholders and Aboriginal organizations and communities.

The scheduled in-service timing for the Project is currently Q2 2017.

A geographic overview of the proposed Project is provided in Figure 1-1.

At this stage in Project planning, approximately 90% of the Project will parallel existing linear disturbances, such as pipelines and roads. Temporary infrastructure such as access roads, stockpile sites, construction camps and contractor yards will be required during construction. Where the pipeline routes parallel existing NGTL pipelines or other pipelines, existing access roads will be used as much as possible.

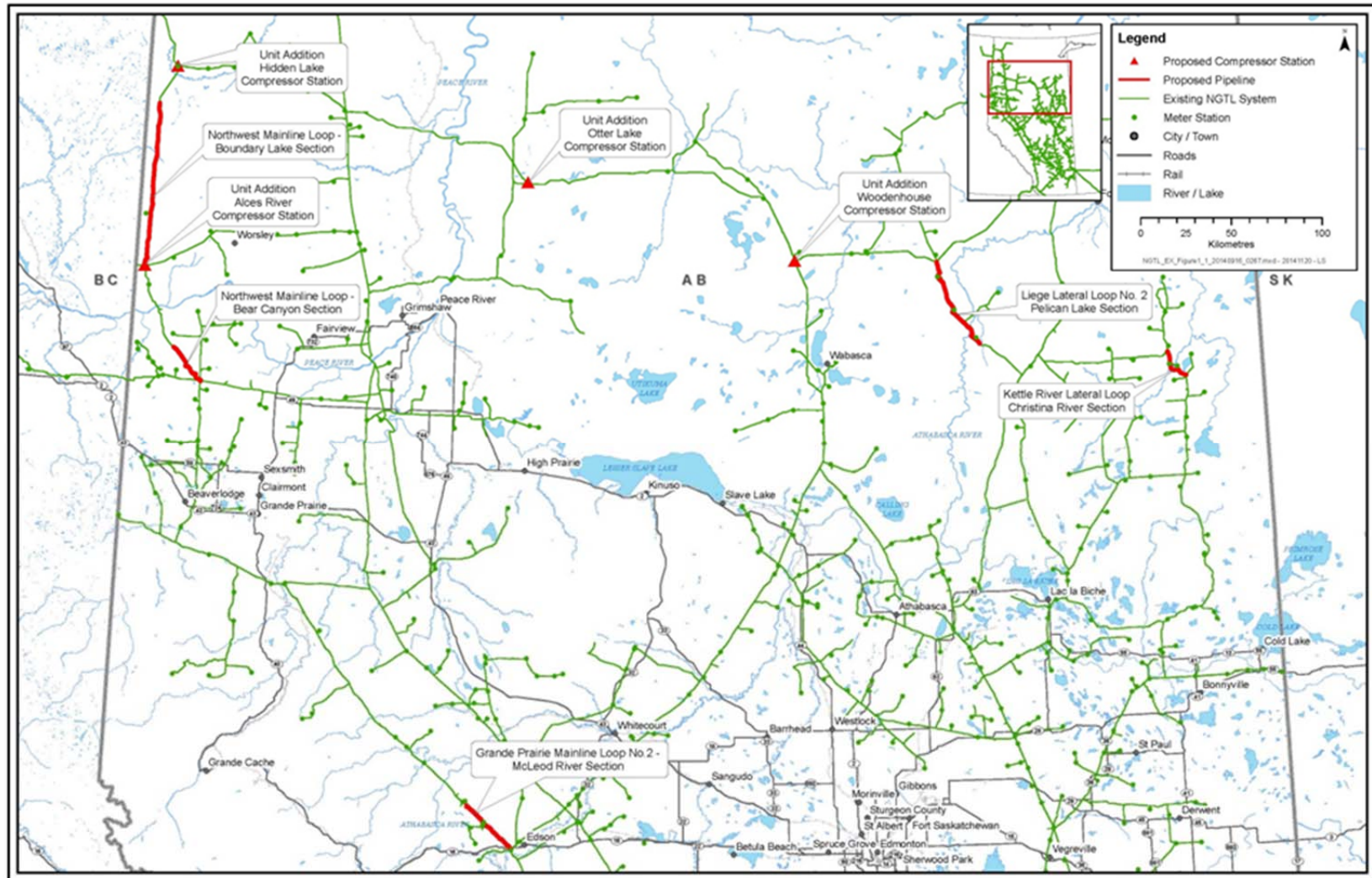


Figure 1-1: Overview Map of Proposed Project

1.3 FEDERAL WORK AND UNDERTAKING

In addition to a requirement for a *Certificate of Public Convenience and Necessity* (CPCN) under the *National Energy Board Act* (NEB Act), other permits and approvals might be required under applicable federal and provincial legislation.

Environmental assessments will be required under both the NEB Act and the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) as the preferred pipeline routes involve more than 40 km of new right-of-way

This Project Description was prepared in accordance with guidance from the NEB website and the Prescribed Information for the Description of a Designated Project Regulation enacted under CEAA 2012. It is intended to:

- facilitate efficient regulatory review of the Project by the NEB
- facilitate determination of the scope of the Project, as well as the scope of assessment required pursuant to the NEB Act and CEAA 2012
- provide the Crown with sufficient information to begin consultation with Aboriginal communities that might potentially be affected by the Project
- provide the NEB with sufficient information to initiate its Participant Funding Program (PFP), Enhanced Aboriginal Engagement and public consultation activities
- inform other regulatory authorities, Aboriginal communities, landowners and stakeholders

1.4 PROJECT PROPONENT

The Project will be constructed and owned by NGTL, a wholly owned subsidiary of TransCanada.

1.4.1 TransCanada

TransCanada is a leader in the responsible development and reliable operation of North American energy infrastructure, including:

- natural gas pipelines
- oil pipelines
- power generation
- gas storage facilities

With more than 60 years of experience building pipelines safely and reliably, TransCanada has an established track record for operational excellence and has

developed and maintained relationships with landowners, stakeholders, and First Nations and Métis across its pipeline systems.

TransCanada's network of approximately 68,500 km wholly owned and 11,500 km partially owned pipelines connects virtually every major natural gas supply basin and market, transporting approximately 20% of the gas consumed in North America.

1.4.2 NGTL System

The NGTL System is an integrated natural gas pipeline system consisting of approximately 24,500 km of pipelines, 94 compressor units at 50 compressor stations comprising more than 1000 MW of power, and other associated facilities, located in northeastern BC and Alberta. The NGTL System is operated by TransCanada pursuant to an agreement with NGTL. The NGTL System transports natural gas to markets in western Canada and connects to other pipelines that deliver natural gas to markets across North America, including the TransCanada Mainline at Empress, AB and TransCanada's wholly owned Foothills System at Caroline, Crowsnest and McNeill, AB.

1.5 ENVIRONMENTAL ASSESSMENT

1.5.1 Scope of Project and Scope of Assessment

The following physical works and activities will be included in the Project scope for the purpose of environmental assessment pursuant to the requirements of the NEB Act and CEAA 2012:

- construction and operation of approximately 230 km of new pipelines and related facilities, including:
 - various pipeline valve sites
 - launcher and receiver facilities
 - cathodic protection (CP)
 - miscellaneous pipeline works (e.g., integration with communication and control systems)
 - alternating current mitigation
 - hydrostatic testing
- construction and operation of four compressor unit additions, including:
 - foundations
 - instrumentation buildings
 - high-pressure piping
 - utility gas, power and instrumentation
 - scrubbers
 - risers

- construction-related temporary infrastructure, such as:
 - access (e.g., roads and travel lanes)
 - pipe and equipment storage sites
 - contractor offices and yards
 - borrow pits
 - construction camps

1.5.2 Other Assessment Regimes

As the Project will form part of a federal work and undertaking subject to the regulatory jurisdiction of the NEB, the Project will be subject to federal environmental assessment processes. Nevertheless, provincial agencies or other regulatory bodies in Alberta might choose to participate in the federal assessment or regulatory processes to facilitate consideration of any concerns or provide advice.

Crown Consultation with Aboriginal Communities

NGTL and its parent company, TransCanada, respect the legal and constitutionally protected rights of Aboriginal communities and recognize that NGTL and TransCanada's relationships with Aboriginal communities are separate and distinct from the relationships those communities have with the Crown.

To the extent that the Project triggers the need for Crown consultation with Aboriginal communities, it is critical that such consultation be initiated and completed in a timely manner. A key objective of this document is to enable the Crown to begin any necessary consultation as soon as possible.

NGTL understands that its engagement with Aboriginal groups as well as the NEB's regulatory process may be relied on by the Crown to satisfy Aboriginal consultation requirements.

1.6 PARTICIPANT FUNDING PROGRAM

The Project will require a public hearing under the NEB Act and will trigger the NEB-administered PFP. This program helps fund timely and meaningful participation by eligible parties such as communities, individual landowners and Aboriginal communities in the NEB's oral hearing process for facility applications.¹

Given the nature and number of steps that will be required to complete the PFP, NGTL requests that the NEB's public announcement of PFP availability is made

¹ See Guide to the National Energy Board Participant Funding Program under the National Energy Board Act, as revised.

within two months of this Project Description filing, consistent with the timing the Board used for other recent applications for a CPCN.²

1.7 PROPONENT CONTACT INFORMATION

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² See the NEB's PFP availability announcements for the Leismer to Kettle River Crossover, North Montney Mainline, Wolverine River Lateral Loop (Carmon Creek section) and Merrick Mainline projects (NEB Filing IDs: A1X2D4, A54731, A3W4L3 and A3X5U8).

2.0 PROJECT INFORMATION

2.1 PIPELINE MAIN COMPONENTS AND STRUCTURES

Primary components of the five pipeline sections are as follows:

- NWML Loop (Boundary Lake Section): approximately 91 km of 914 mm diameter (NPS 36) pipeline
- NWML Loop (Bear Canyon Section): approximately 27 km of 914 mm (NPS 36) pipeline
- GPML Loop No. 2 (McLeod River Section): approximately 36 km of 1219 mm diameter (NPS 48) pipeline
- Liege Lateral Loop No. 2 (Pelican Lake Section): approximately 56 km of 762 mm diameter (NPS 30) pipeline
- Kettle River Lateral Loop (Christina River Section): approximately 20 km of 610 mm diameter (NPS 24) pipeline

All pipeline sections will include pipeline valves, CP facilities and miscellaneous pipeline works. Launchers and receivers and/or provisions for launchers and receivers will be installed for in-line inspection (ILI) purposes.

2.2 COMPRESSOR STATION COMPONENTS AND STRUCTURES

Primary components of the four compressor stations are as follows:

- Alces River Compressor Station Unit Addition: addition of a single turbo-compressor unit (gas turbine and compressor) of 15 MW.
- Hidden Lake North Compressor Station Unit Addition: addition of a single turbo-compressor unit (gas turbine and compressor) of 15 MW.
- Otter Lake Compressor Station Unit Addition: addition of a single turbo-compressor unit (gas turbine and compressor) of 30 MW at the existing Otter Lake Compressor Station.
- Woodenhouse Compressor Station Unit Additions: addition of 30 MW in turbo-compressor unit(s) (gas turbine and compressor) adjacent to the existing Woodenhouse Compressor Station.

All unit addition sites will include a compressor building, auxiliary buildings and yard piping.

2.2.1 Location of Project Components

For approximate geographical coordinates of the main Project components, see Table 2-1 and Table 2-2. For map locations of the components, see Figure 2-1 and Figure 2-2. For a foldout map that shows the proposed pipeline route and primary facilities, see Appendix A.

Table 2-1: Approximate Coordinates of Pipeline Components

Component	Easting	Northing	UTM Zone
NWML Loop			
Boundary Lake start point	319365.9	6251130.9	11
Boundary Lake end point	325292.9	6340482.1	11
Bear Canyon start point	351880.5	6188079.5	11
Bear Canyon end point	336657.5	6206301.2	11
GPML Loop No.2			
McLeod River start point	530417.5	5934330.8	11
McLeod River end point	505292.2	5958187.6	11
Liege Lateral Loop No. 2			
Pelican start point	407415.9	6212781.9	12
Pelican end point	386267.0	6259286.4	12
Kettle River Lateral Loop			
Christina River start point	510528.7	6202616.6	12
Christina River end point	519891.0	6189133.1	12
Note: Final pipeline routing will be subject to engineering and environmental site evaluations, Aboriginal and stakeholder engagement, land acquisition and consultation with regulatory agencies.			

Table 2-2: Approximate Coordinates of Compressor Stations

Component	Easting	Northing	UTM Zone
Alces Compressor Station	319511.9	6250931.6	11
Hidden Lake North Compressor Station	334535.0	6361694.0	11
Otter Lake Compressor Station	527603.4	6303778.0	11
Woodenhouse Compressor Station	677621.5	6263969.3	11
Note: Final compressor station locations will be subject to engineering and environmental site evaluations, Aboriginal and stakeholder engagement, land acquisition and consultation with regulatory agencies.			

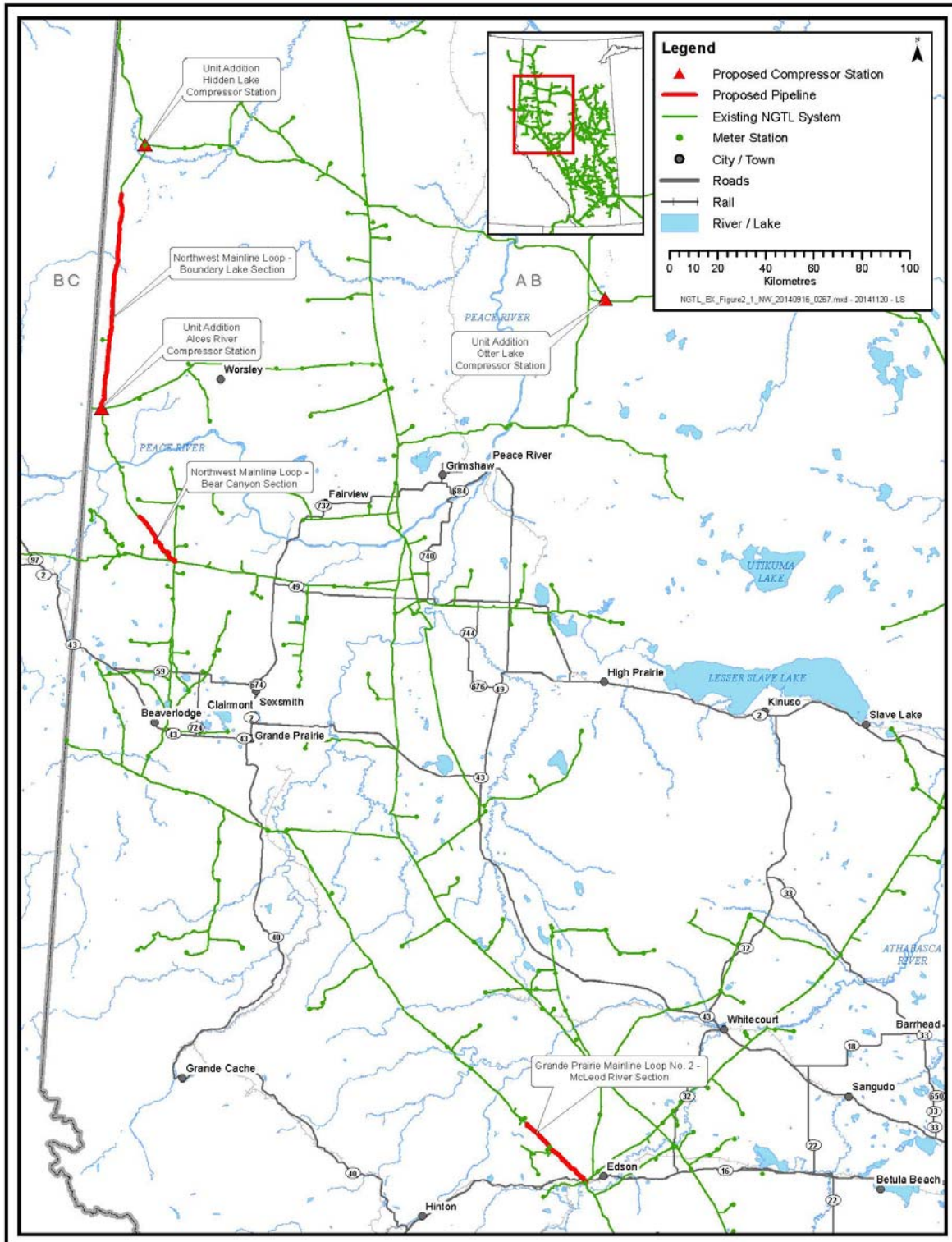


Figure 2-1: Location of Main Project Components (Northwest Alberta)

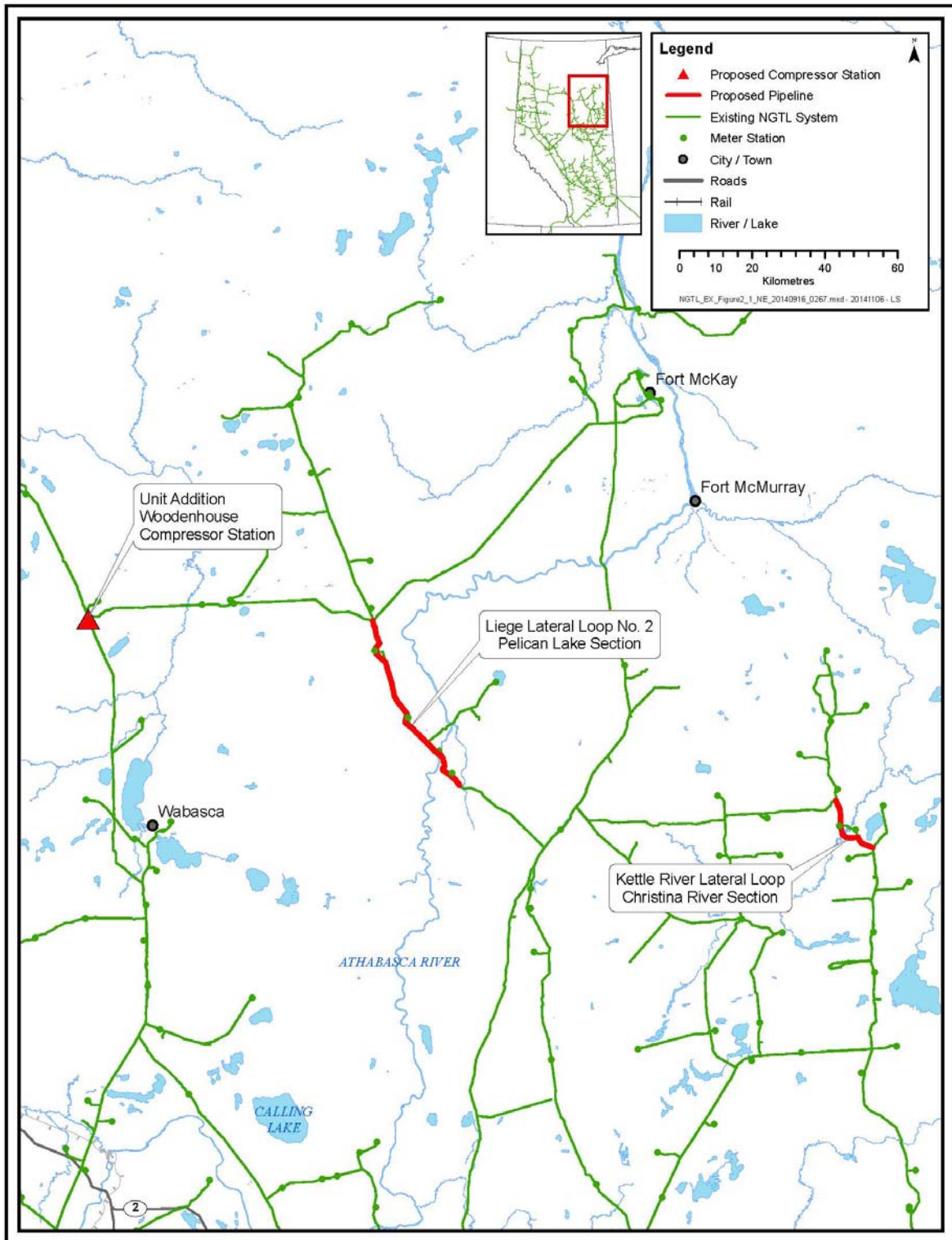


Figure 2-2: Location of Main Project Components (Northeast Alberta)

2.2.2 Pipeline Routing and Facilities

Pipeline Route and Site Selection

NGTL employs a systematic and thorough route selection process using a variety of tools, such as:

- desktop studies
- helicopter reconnaissance
- ground verification and field surveys
- engineering, geotechnical and environmental field studies

This route selection process takes into account the objectives of minimizing the total route length or land requirements, meeting applicable regulatory requirements and reducing the environmental footprint, while carefully assessing overall cost and constructability, and meeting customer demands.

Feedback through stakeholder and Aboriginal engagement programs is also considered.

2.2.3 Proposed Pipeline Route, Parallels and New Right-of-Way

NWML Loop – Boundary Lake Section

The NWML Loop – Boundary Lake Section facilities consist of approximately 91 km of 914 mm (NPS 36) pipeline. The route begins at the Alces River Compressor Station, situated approximately 54 km northeast of Fort St. John, BC.

It then proceeds north, paralleling the BC border, and connects with the existing Boundary Lake Section at the Owl Lake Meter Station South facility, located approximately 145 km northeast of Fort St. John, BC.

Approximately 85 km (93%) of the proposed route is contiguous with existing pipeline right-of-way (ROW) and access roads paralleling the existing ROW. Approximately 6 km (7%) of the route currently consists of new ROW. The new ROW is required in areas of congestion and to address potential construction and environmental issues and requirements. For the approximate lengths of both parallel loop and new ROW, see Table 2-3.

NWML Loop – Bear Canyon Section

The NWML Loop – Bear Canyon Section facilities consist of approximately 27 km of 914 mm (NPS 36) pipeline. The route begins at the Saddle Hills Compressor Station, situated approximately 32 km west of Spirit River, AB. It then proceeds northwest to an existing valve site, approximately 44 km northeast of Dawson Creek, BC.

Approximately 20 km (74%) of the proposed route parallels existing linear disturbances, such as pipelines and roads. Approximately 7 km (26%) of the route currently consists of new ROW, which is required in areas of congestion and to address potential construction, environmental issues and landowner requirements.

For the approximate lengths of both parallel loop and new ROW, see Table 2-3.

GPML No. 2 – McLeod River Section

The GPML Loop No. 2 – McLeod River Section consists of approximately 36 km of 1219 mm (NPS 48) pipeline. The route begins at legal location NW 21-55-20 W5M and terminates at the existing Grande Prairie Mainline valve site approximately 5 km west of Edson, AB.

Approximately 34 km (92%) of the proposed route parallels existing linear disturbances, such as pipelines and roads. Approximately 4 km (8%) of the route currently consists of new ROW, which is required in areas of congestion and to address potential construction, environmental issues and landowner requirements.

For the approximate lengths of both parallel loop and new ROW, see Table 2-3.

Liege Lateral Loop No. 2 – Pelican Lake Section

The Liege Lateral Loop No. 2 – Pelican Lake Section consists of approximately 56 km of 762 mm (NPS 30) pipeline. The route begins at the Buffalo Creek Compressor Station, situated approximately 100 km southwest of Fort McMurray, AB. It then proceeds in a southeasterly direction to connect to the Liege Lateral Loop No. 2 – Thornbury Section at the Pelican Lake Compressor Station, located approximately 101 km southwest of Fort McMurray, AB and 31 km west of Mariana Lake, AB.

Approximately 54 km (97%) of the proposed route is contiguous with existing pipeline ROW or other existing disturbance. Approximately 2 km (3%) of the route currently consists of new ROW. The new ROW is required in areas of congestion and to address environmental and construction requirements.

For the approximate lengths of both parallel loop and new ROW, see Table 2-3.

Kettle River Lateral Loop – Christina River Section

The Kettle River Lateral Loop – Christina River Section consists of approximately 20 km of 610 mm (24 NPS) pipeline. The route begins at the Leismer–Kettle River Crossover, which is approximately 91 km southeast of Fort McMurray. It proceeds in a southeasterly direction to tie in at the Graham and Graham Loop 2 junction, which is approximately 107 km southeast of Fort McMurray and 2 km south of Bohn Lake.

Approximately 16 km (84%) of the proposed route is contiguous with existing ROW. Approximately 3.1 km (16%) of the route currently consists of new ROW. The new ROW is required in areas of congestion and to address potential constructability issues.

For the approximate lengths of both parallel loop and new ROW, see Table 2-3.

Table 2-3: Parallel and New Right-of-Way – Pipeline Segments

Project Component	Approximate Parallel ROW^{1, 2} (km)	Approximate New ROW² (km)
NWML Loop (Boundary Lake Section)	85	6
NWML Loop (Bear Canyon Section)	20	7
GPML No. 2 (McLeod River Section)	34	3
Liege Lateral Loop No. 2 (Pelican Section)	53	3
Kettle River Lateral Loop (Christina River Section)	16	3
TOTAL	208	22
Note: 1. Includes pipeline and access road parallels. Pipelines paralleled include NGTL System and other pipelines. 2. Numbers have been rounded.		

For the locations where the proposed ROW for the Project components loop existing NWML, GPML, Liege and Kettle River Laterals, in addition to the locations where new ROW will be required, see Figure 2-3 through Figure 2-5.

2.2.4 Mainline Valve Sites

Mainline valves will be installed at intervals as required along the proposed pipelines and will be located in the permanent ROW. Temporary workspace (TWS) will be required at these sites during construction. The permanent sites will be fenced to ensure safety and protection of the asset, as well as to ensure safety of the public and the environment.

Access to valve sites will be via the permanent ROW or permanent or temporary access roads during both construction and operations.

Mainline valves will be designed and installed in accordance with Canadian Standards Association (CSA) Z662-11 standards.

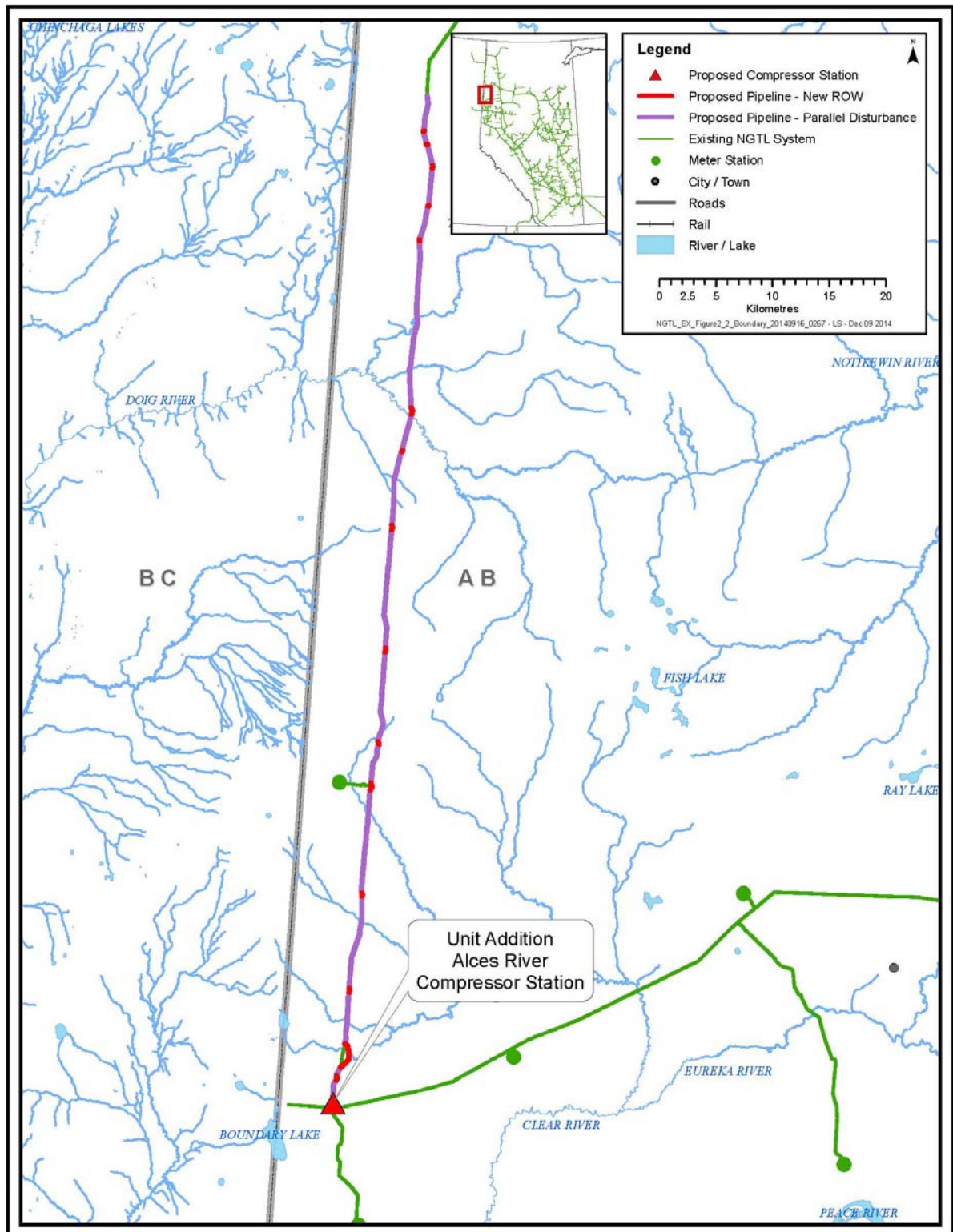


Figure 2-3: Parallel and New Right-of-Way – NWML Loop (Boundary Lake Section)

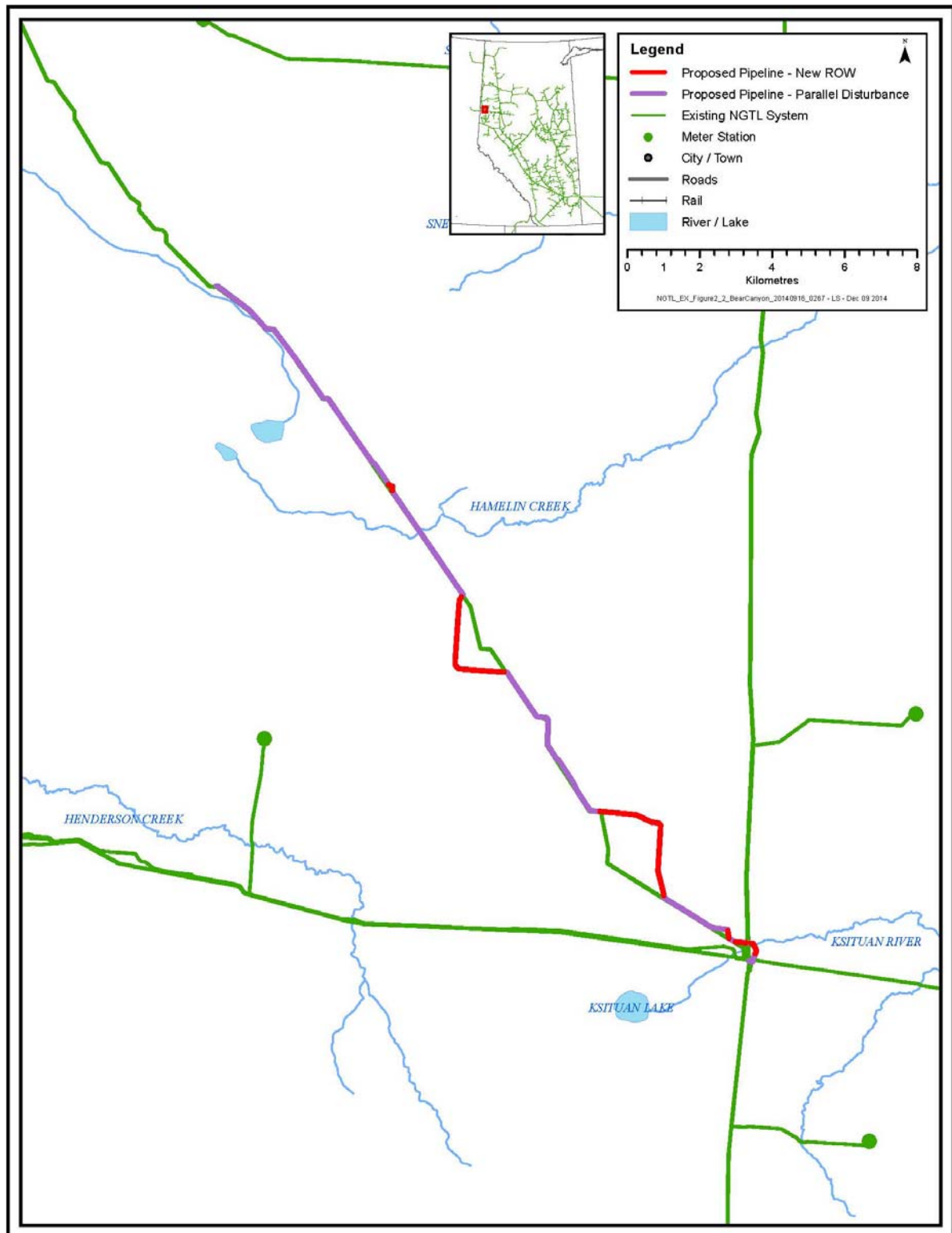


Figure 2-4: Parallel and New Right-of-Way – NWML Loop (Bear Canyon Section)

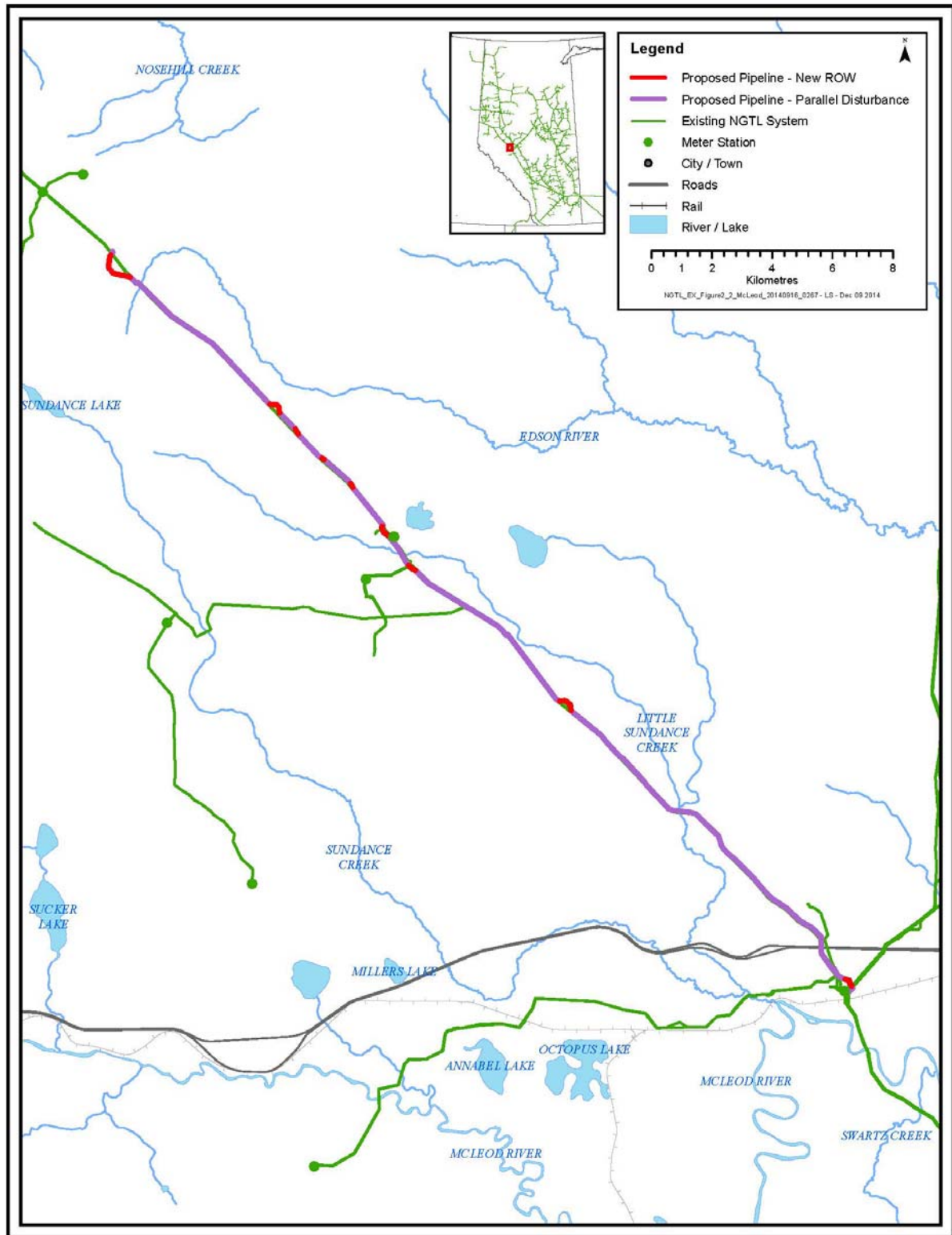


Figure 2-5: Parallel and New Right-of-Way – GPML No. 2 (McLeod River Section)

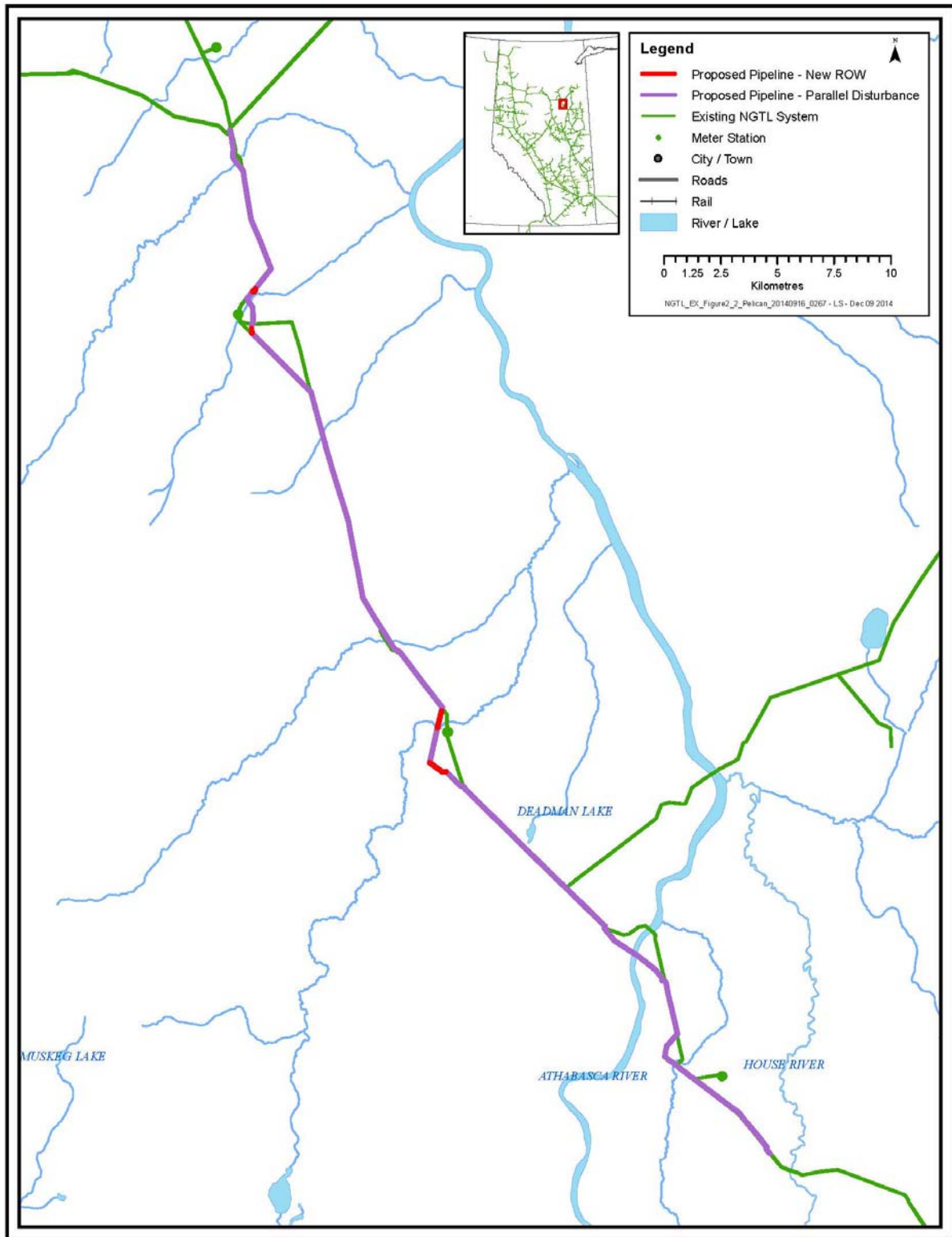


Figure 2-6: Parallel and New Right-of-Way – Liege Lateral Loop No. 2 (Pelican Lake Section)

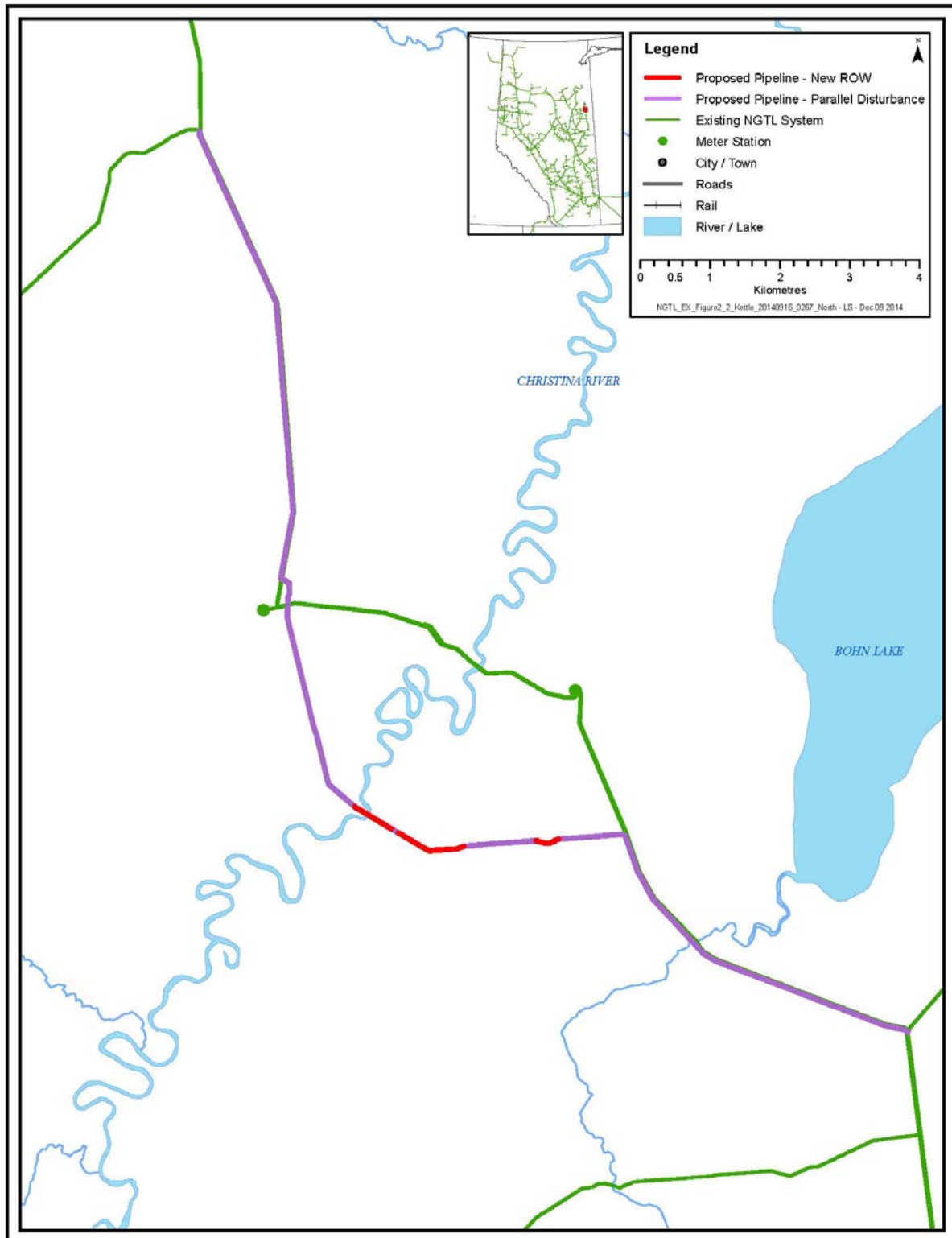


Figure 2-7: Parallel and New Right-of-Way – Kettle River Lateral Loop (Christina River Section)

2.2.5 In-Line Inspection Facilities

Launchers and receivers and/or provisions for launchers and receivers will be installed for ILI purposes. Information on these facilities will be provided in NGTL's Section 52 application.

2.2.6 Cathodic Protection

The pipeline segments of the Project will share the CP system that currently protects the NGTL System. Requirements for upgrades to the existing CP system may be needed and will be evaluated at a later date, including investigation of potential alternating current (AC) mitigation measures where required. New test stations will be installed at appropriate intervals and locations along the Project to monitor the effectiveness of the applied CP current.

Compressor station CP requirements will be determined during detailed design.

2.2.7 Supervisory Control and Data Acquisition System

The Project will include installation and operation of a supervisory control and data acquisition (SCADA) system, which allows for remote monitoring. The Project's SCADA system will be connected to TransCanada's Operations Control Centre (OCC), located in Calgary. Once the proposed Project facilities are placed in-service, they will be monitored and controlled from TransCanada's 24-hour OCC as part of the NGTL System.

2.3 PRELIMINARY FOOTPRINT OF MAIN PROJECT COMPONENTS

2.3.1 Construction Right-of-Way and Temporary Workspace

Dimensions of the pipeline construction ROW will vary depending on the ownership, location and nature of existing parallel ROW. Where available and feasible, temporary workspace will also be obtained from existing contiguous ROW to reduce the potential disturbances. The pipeline components will require a minimum construction ROW of at least 27 m for safe and efficient construction. In addition to the minimum ROW, further land will be required for handling and storing surface material.

During construction, land will be required for temporary infrastructure such as construction camps, borrow pits, access roads, pipe/equipment storage sites, contractor offices/yards and similar construction-related purposes. Land disturbed for these purposes will be reclaimed after construction as required by Crown land permit conditions or as per private agreements with freehold landowners.

Where the pipeline route is adjacent to existing disturbances such as seismic lines, transmission lines and roads, NGTL may use these existing disturbances to reduce the requirement for new land disturbance for the construction ROW.

In addition to construction ROW, site-specific TWS will be required at highway, railway, road, pipeline and watercourse crossings and at other locations to accommodate pipeline construction activities.

The construction ROW and TWS will be reclaimed after construction. A permanent easement will be established and maintained for pipeline operations.

2.3.2 Compressor Station Sites

The compressor stations will have footprints that range from 100 m by 100 m to 300 m by 500 m. The stations are powered by natural gas turbine engines.

In addition to remote monitoring by TransCanada's OCC, a local safety system automatically shuts down the compressor in case of abnormal operation conditions. These permanent sites are fenced.

Subject to detailed design, the compressor station unit additions will include the following:

- foundations
- instrumentation buildings
- high-pressure piping
- utility gas, power and instrumentation
- scrubbers
- risers

2.3.3 Mainline Valve Sites

Mainline valve sites will be located in the permanent ROW. TWS will be required at these sites during constructions. The permanent sites will be fenced to ensure safety and protection of the asset, as well as to ensure safety of the public and the environment.

Access to valve sites will typically be via the permanent ROW.

3.0 PROJECT ACTIVITIES

The Project will have the following phases:

- proposal and definition
- construction and in-service timelines
- operations and maintenance
- decommissioning, abandonment and site reclamation

3.1 PROJECT DEFINITION

The Project proposal phase began in Q2 2014. The Project definition phase will begin in Q1 2015.

Work on the Project began in 2014 with the start of preliminary routing studies and stakeholder and Aboriginal engagement. Aboriginal engagement for the GPML Loop No. 2 – McLeod River section began in 2011 to support a proposed Application with the NEB that was subsequently delayed until present.

Activities during the proposal and definition phases will include:

- completing project planning and preliminary design in sufficient detail for the preparation of regulatory applications, which will include completing route selection and developing survey alignment plans
- conducting biophysical and socio-economic studies and assessments, including field surveys
- undertaking detailed engineering design and geotechnical studies and field work
- initiating engagement with Aboriginal communities
- initiating consultation with landowners, occupants and Crown disposition holders
- preparing regulatory applications and initiating the regulatory review process

The information in this Project Description is based on conceptual design. It will be refined over time as field and other additional data are collected and assessed, and as engineering and construction planning progresses through preliminary and detailed design.

Changes could also be made to reflect the results of consultation and engagement programs, commercial negotiations, and economic, engineering and environmental and socio-economic assessments.

The Project application for a CPCN under Section 52 of the NEB Act will reflect changes and refinements to the Project that are made after this Project Description is

submitted to the NEB. The application, which will include an Environmental and Socio-Economic Assessment (ESA), is scheduled for filing with the NEB in Q1 2015.

The information provided in the Section 52 application will be based on preliminary design, supported by initial results from desktop data, field investigation, geotechnical investigation, and engagement and consultation programs.

While preliminary information to support the Project will be included in the Section 52 application, NGTL expects that supplemental environmental field studies will be required after the application is submitted to confirm preliminary findings regarding valued ecosystem components such as wetlands, wildlife, aquatics, soil, vegetation and heritage resources, as well as traditional land and resource use.

3.2 CONSTRUCTION AND IN-SERVICE TIMELINES

Opportunities to optimize the infrastructure, pipeline and facility construction schedule will be pursued throughout the Project development process. Environmental timing windows will be considered during detailed construction planning. Construction is currently planned to occur between Q3 2016 and the Q2 2017.

For the overall Project schedule, see Figure 3-1.

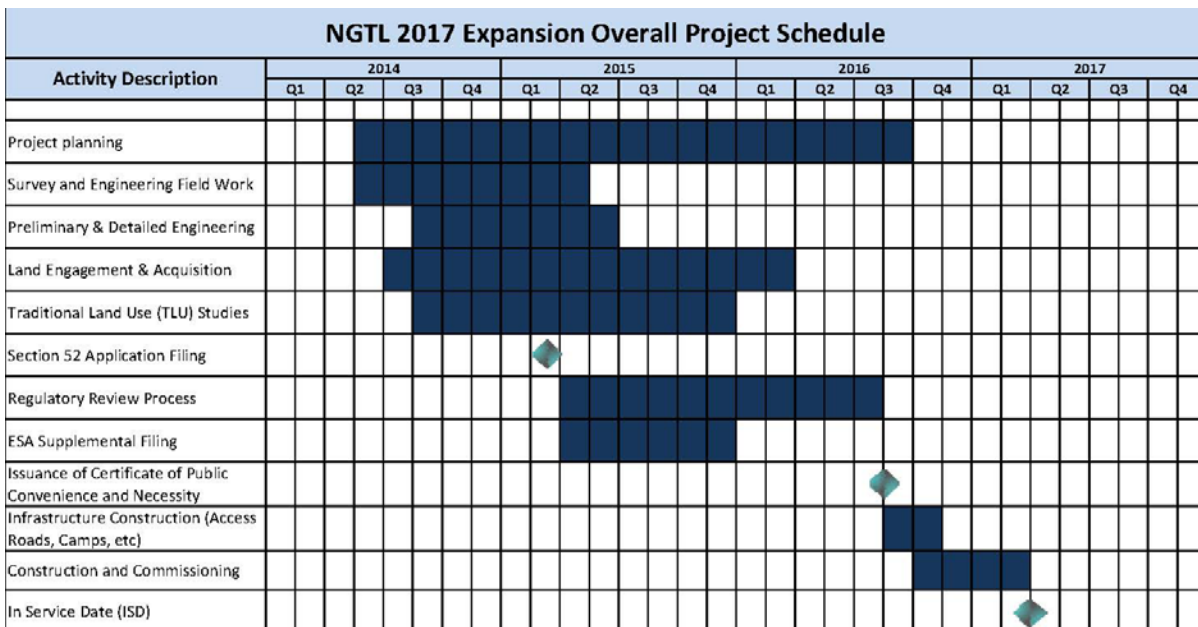


Figure 3-1: Preliminary Project Schedule

3.3 OPERATIONS AND MAINTENANCE

3.3.1 Health, Safety and Environment

All activities associated with the Project, including health, safety and environmental (HSE) performance will meet or exceed applicable laws and regulations and will align with the NEB's *Onshore Pipeline Regulations*.

NGTL will address responsibilities for HSE performance through TransCanada's HSE management system framework supporting safety, emergency management and environmental protection programs. This framework will apply to the complete life cycle of the Project, from design and constructions, through operations to abandonment. It is reviewed and updated regularly.

3.3.2 System Protection and Controls

Once the proposed Project facilities are placed in service, they will form part of the NGTL System and will be monitored and controlled from TransCanada's 24-hour OCC as part of the NGTL System.

TransCanada's OCC SCADA system continuously monitors pipeline flow, pressure, temperature and equipment status. The SCADA system alerts the OCC operator of significant operational changes in the pipeline system to enable appropriate action to be taken.

Project facilities will also have local safety systems to react to abnormal operational events or loss of communications.

3.3.3 Emergency Response

Project facilities will be incorporated in TransCanada's emergency management system. TransCanada is accountable for emergency management for the NGTL System.

Before the Project facilities are put into operation, TransCanada will work with external emergency response personnel to ensure appropriate:

- communications protocols
- operations and product awareness
- understanding of TransCanada's emergency response procedures

This helps ensure that company emergency plans appropriately link into plans maintained by other affected agencies.

3.3.4 Public Awareness

TransCanada's existing Public Awareness (PA) program will be applied during the operational life of the Project.

The PA program is designed to increase awareness of pipeline safety and thereby protect the public, environment and TransCanada facilities. The program is intended to reach affected members of the public, excavators, contractors, emergency response providers and local public officials. It provides education about living and working safely near TransCanada facilities and includes safety messages on special incident response notification and evacuation measures, as appropriate, as well as information about TransCanada's Integrity Management Program (IMP).

3.3.5 Maintenance Programs

TransCanada's standard preventive maintenance programs will be incorporated in the design and operation of the proposed Project facilities. These programs include:

- internal inspections
- CP monitoring
- pipeline markers at roads and pipeline watercourse crossings
- planned maintenance activities

3.4 DECOMMISSIONING, ABANDONMENT AND SITE RECLAMATION

The Project components are expected to operate for at least 40 years. Decommissioning and abandonment activities will comply with applicable federal and provincial regulatory requirements in force at the time. Additional information will be provided in NGTL's Section 52 application. Individual components might operate for less than the overall Project lifespan.

4.0 LAND

This section described the land requirements for the Project and the process for acquiring these lands. The land requirements include:

- Crown and private land tenure for the proposed pipeline and associated facilities
- TWS requirements for construction

4.1 LAND OWNERSHIP

For the various land types crossed by the Project, see Table 4-1.

Table 4-1: Land Ownership Along Proposed Pipeline Routes

Pipeline Section	Land Type	Percentages by Land Type	Length (km)
NWML Loop - Boundary Section	Freehold	0%	0
	Provincial (Crown)	100%	91
NWML Loop - Bear Canyon Section	Freehold ¹	50%	13
	Provincial (Crown)	50%	13
GPML Loop No. 2 - McLeod River Section	Freehold ¹	8%	3
	Provincial (Crown)	92%	33
Liege Lateral Loop No. 2 - Pelican Section	Freehold	0%	0
	Provincial (Crown)	100%	56
Kettle River Lateral Loop – Christina River Section	Freehold	0%	0
	Provincial (Crown)	100%	20
	Total		230
Note: To date, 5 private freehold landowners and 2 corporate landowners have been identified along the proposed pipeline routes.			

All four proposed compressor station unit addition sites are located on 100% Provincial (Crown) land.

4.1.1 Federally Owned and Administered Land

The proposed pipeline routes do not traverse any federally owned or administered land.

4.1.2 Consultation with Landowners, Occupants and Crown Disposition Holders

Project representatives have identified landowners, occupants and Crown disposition holders along the proposed pipeline routes to:

- introduce the Project to potentially affected landowners, occupants and Crown disposition holders
- identify early routing concerns and recommendations
- notify affected stakeholders of engineering and environmental field surveys

In Q3 2014 landowners were presented with information on the Project during survey notification meetings.

Landowners, occupants and Crown disposition holders (trappers and grazing lease holders) were called and sent or hand-delivered a project information package and invited to contact NGTL with any questions, concerns or inquiries. They will also be invited to attend any open houses scheduled in the future.

4.2 LAND USE

The majority of lands affected by the Project are forested, with a smaller percentage of agricultural land. Oil and gas development is a prominent activity in the surrounding areas.

4.2.1 Trapper Permit Areas (TPA) and Grazing Lease Holders (GRL)

There are 22 registered Trapper Permit Areas crossed by the Project (see Table 4-2). NGTL has consulted with trappers and will compensate them for fur loss or grazing interruptions. NGTL has also consulted with one grazing lease holder on the GPML Loop No.2 – McLeod River Section.

Table 4-2: Trapper Permit Areas and Grazing Lease Holders

Pipeline Section	TPA/GRL
NWML Loop (Boundary Lake Section)	2301 2725 1448 2226 2485
NWML Loop (Bear Canyon Section)	2691 2484 2717
GPML Loop No. 2 (McLeod River Section)	1204 2206 1235 16559 (GRL)

Table 4-2: Trapper Permit Areas and Grazing Lease Holders (cont'd)

Pipeline Section	TPA/GRL
Liege Lateral Loop No. 2 (Pelican Section)	1865 166 602 2008 1217
Kettle River Lateral Loop (Christina River Section)	629 933
Alces River	1903
Hidden Lake	2284
Otter lake	2574
Woodenhouse	2366

4.2.2 Wildlife Management Units (WMU)

There are 13 Wildlife Management Units crossed by the Project (see Table 4-3).

Table 4-3: Wildlife Management Units

Pipeline Section	WMU
NWML Loop (Boundary Lake Section)	524 525
NWML Loop (Bear Canyon Section)	358 359
GPML Loop No. 2 (McLeod River Section)	340 342 346
Liege Lateral Loop No. 2 (Pelican Section)	518 519
Kettle River Lateral Loop (Christina River Section)	517
Alces River Compressor Station Unit Addition & Hidden Lake Compressor Unit Addition	524
Otter Lake Compressor Station Unit Addition	520
Woodenhouse Compressor Station Unit Addition	542

For a map showing land use in the Project area, see Figure 4-1.

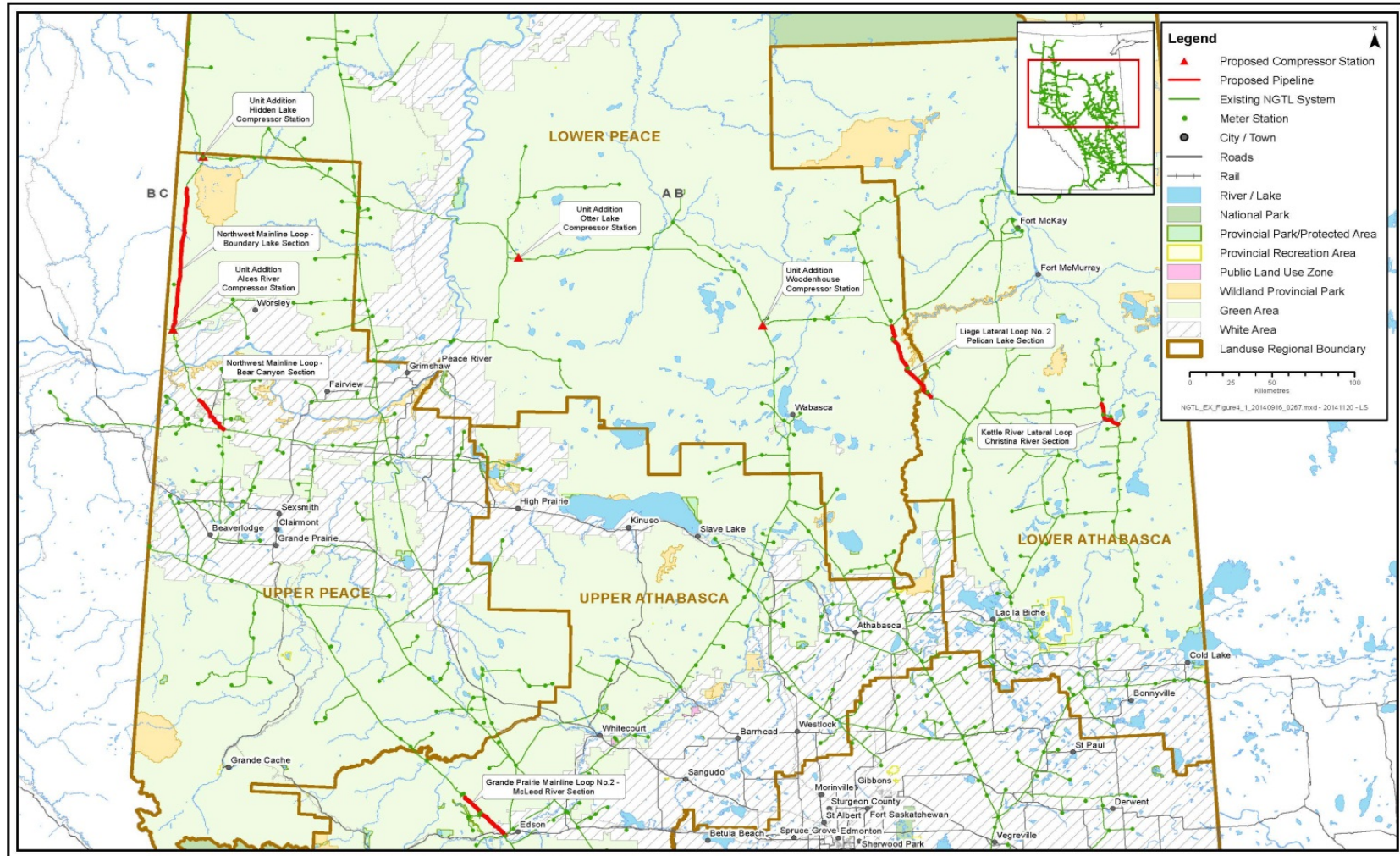


Figure 4-1: Land Use in the Project Area

4.2.3 Industry

The main industry employers in the Project area include:

- oil and gas
- forestry
- other activities such as trapping and guiding/outfitting

Oil and gas exploration, development activities and infrastructure in the Project area include:

- seismic exploration
- pipelines and related facilities
- well sites
- gas processing plants
- access roads

4.2.4 Recreation

The Project does not cross any parks or protected areas. Outdoor recreational activities such as hunting, hiking and snowmobiling/quading occur throughout the Project area. Recreational fishing occurs in the major watercourses along the Project footprint.

4.2.5 Reserves Under the *Indian Act*

The Project does not cross any Indian Reserves, as defined under the *Indian Act*.

For a preliminary list of Aboriginal communities identified as having potential interest in the Project, see Section 6.2.2.

4.2.6 Designated Environmental and Cultural Sites

A portion of the NWML Loop – Boundary Lake Section crosses provincial Environmentally Significant Area 739B. The Liege Lateral Loop No. 2 – Pelican Lake Section crosses Environmentally Sensitive Areas 548 and 692 at several locations along the proposed loop.

There are two provincially designated archaeological sites (Alberta Culture and Tourism Site GlQv-1 and Site HcPf-1) with potential to be affected by the pipeline loops. Archaeological Site GlQv-1 is located in the construction ROW of the Northwest Mainline Loop – Bear Canyon Section and has a Historic Resource Value (HRV) of 0, indicating further work is not required.

Archaeological Site HcPf-1 is located approximately 50 m east of the proposed construction ROW of the Liege Lateral Loop No. 2 – Pelican Lake Section and does not currently have an assigned HRV.

No part of the proposed route is located on land under the jurisdiction of Parks Canada or in an existing:

- important bird area
- national wildlife area
- ecological reserve
- regional park

5.0 ENVIRONMENTAL FEATURES

This section provides an overview of the environmental features for the Project. It addresses the biophysical and socio-economic environment in the Project area in concordance with the Filing Manual.

NGTL is engaging interested Aboriginal communities on the biophysical and heritage resource field studies for the Project. Traditional Ecological Knowledge (TEK) made available to NGTL during the field studies will be factored into Project plans and programs, including the Environmental and Socio-economic Assessment (ESA), as available and appropriate

NGTL will conduct an environmental assessment for the Project in accordance with the requirements of the NEB Filing Manual and the CEAA 2012. This assessment will consider the potential effects of the Project, as well as potential cumulative effects that overlap with the effects of the Project.

5.1 PHYSICAL ENVIRONMENT

The Project components are located in the Northern Alberta Uplands, Northern Alberta Lowlands, Southern Alberta Uplands, Saskatchewan Plains and Eastern Alberta Plains regions of the Interior Plains physiographic subdivision.³

The Project components cross the Dry Mixedwood, Central Mixedwood and Lower and Upper Boreal Highlands natural subregions of the Boreal Forest Natural Region and the Lower Foothills Natural Subregion of the Foothills Natural Region (see Figure 5-1).⁴ The landscape is dominated by level to undulating, fine-textured lacustrine and till plains.⁵

The climate in the Boreal Forest Natural Region is variable with short summers and long winters. Summer extends for only one or two months, in which the average daily temperature exceeds 15°C. Winters are long and cold, with average daily temperatures below -10°C for four months or more in most of the natural subregions. Precipitation follows a summer-high continental pattern, with peak rainfalls occurring in July and about 60-70% of the annual precipitation received between April and August.

³ Pettapiece 1986

⁴ Natural Regions Committee 2006

⁵ Natural Regions Committee 2006



In the Foothills Natural Region, the Lower Foothills Natural Subregion has somewhat warmer summers and colder winters than the Upper Foothills Natural Subregion, which is adjacent to the southwest. The growing season is longer and total precipitation is lower, especially in the winter months, indicating a stronger continental climate influence. Higher elevations and proximity to the mountains produce cooler summers, warmer winters and more precipitation than is characteristic of the adjacent Central Mixedwood Natural Subregion to the north and east.

The Project is not located in the discontinuous permafrost zone⁶, nor are any Project components located in the permafrost⁷ Zone.

5.2 ATMOSPHERIC ENVIRONMENT

Regional air quality in the Project area is monitored at a number of stations in Alberta.

Air quality is monitored through a network of existing air quality monitoring stations operated by AESRD, Airshed Zones such as the Peace and Wood Buffalo Zones, Environment Canada and industry. Representative air monitoring stations will be identified for the various pipeline loops and compressor stations from online sources. These identified stations are expected to provide an adequate representation of existing criteria air contaminant (CAC) concentrations in the Project area.

5.2.1 Pipeline

Emissions for the various pipeline loops are expected to be negligible during the operations phase. It is expected that the largest release of emissions will be during the construction phase of the Project. There could be fugitive volatile organic compound (VOC) emissions associated with the pipeline.

5.2.2 Compression Stations

For the compressor stations required for the Project, a quantitative air quality assessment of operations emissions will be undertaken as part of the ESA. The measurable parameters that will be assessed include the following CACs:

- nitrogen oxides
- sulphur dioxide
- carbon monoxide
- particulate matter

⁶ Environment Canada 2008

⁷ Natural Resources Canada 2009a

For GHG emissions, the measurable parameters that will be assessed include:

- carbon dioxide
- methane
- nitrous oxide

5.3 ACOUSTIC ENVIRONMENT

5.3.1 Pipeline

Ambient noise in the Project area is primarily caused by vehicle traffic and existing facility operation and maintenance. During construction, elevated noise levels will result from equipment and traffic. Potential receptors of these noise emissions include residents near the Project.

As construction is a temporary activity, a qualitative assessment of the acoustic environment will be completed for the construction phase of the Project. Mitigation measures, as recommended by best management practices such as Alberta Energy Regulator (AER) Directive 038: Noise Control⁸, will be followed to reduce construction noise. Sensory disturbance for wildlife will also be assessed as part of the ESA.

During operations, with the exception of ILI and general maintenance activities, noise generated by the proposed pipeline is expected to be undetectable and will not contribute to ambient noise levels.

5.3.2 Compressor Stations

For compression facilities required by the Project, a quantitative assessment of the acoustic environment will be completed. Changes in the acoustic environment due to the compression facility will be assessed through detailed noise propagation modelling. Modelling will be incorporated in the ESA, and will be in accordance with applicable federal and provincial requirements.

As construction noise is temporary, a qualitative assessment of the acoustic environment will be completed for the construction phase of the Project.

⁸ Alberta Energy and Utilities Board 2007

5.4 WASTE DISPOSAL

Typical waste types expected to be generated during Project construction and operations include:

- motor oils
- hydraulic fluids
- welding rods
- hydrostatic testing water
- construction materials
- horizontal directional drilling (HDD) fluids
- domestic waste

Waste handling and disposal will be different for hazardous and non-hazardous materials, and will be in accordance with the Environmental Protection Plan that will be submitted as part of the ESA for the Project. This plan will meet the requirements of all applicable legislation.

5.5 WATER

The following describes the watershed basins and any watercourses that may be intersected by the Project.

5.5.1 Watercourse crossings

NWML Loop – Boundary Lake Section

A total of 58 potential watercourse crossings were identified along the proposed NWML Loop – Boundary Lake Section. The proposed crossings are situated in the Peace River Basin and the Doig River and Little Clear River sub-basins. Named watercourses along the NWML Loop – Boundary Lake Section include Mearon Creek, Betts Creek, Doig River, Sweeney Creek, McLean Creek, Little Clear River, along with several unnamed tributaries. Mearon Creek and Betts Creek are direct tributaries to the Doig River, which drains into the Beatton River. Sweeney Creek and McLean Creek are direct tributaries to the Little Clear River, which drains directly into the Clear River. The Beatton River and Clear River are tributaries to the Peace River.

NWML Loop – Bear Canyon Section

Five potential watercourses were identified along the proposed NWML Loop – Bear Canyon Section. The proposed crossings are situated in the Peace River Basin. Named watercourses along the NWML Loop – Bear Canyon Section include Hammelin Creek and Ksituan River as well as three unnamed tributaries to the

Ksituan River. Both Hammelin Creek and Ksituan River are direct tributaries to the Peace River.

GPML Loop No. 2 – McLeod River Section

All 16 of the potential watercourse crossings identified along the proposed GPML Loop No. 2 – McLeod River Section are situated in the Athabasca River Basin. Named watercourses along the GPML Loop No. 2 – McLeod River Section include Little Sundance Creek and Edson River, and six unnamed tributaries to Little Sundance Creek, five unnamed tributaries to Edson River and three unnamed tributaries to McLeod River. All watercourses drain to the McLeod River.

Liege Lateral Loop No. 2 – Pelican Lake Section

A total of 30 potential watercourses were identified along the proposed Liege Lateral Loop No. 2 – Pelican Lake Section. The proposed crossings are situated in the Athabasca River Basin. Named watercourses along the proposed Liege Lateral Loop No. 2 – Pelican Lake Section include the Livock River, Loon Creek, Athabasca River, Deadman Creek and Boivin Creek, as well as several unnamed tributaries. The Livock River and Loon, Deadman and Boivin creeks are all direct tributaries to the Athabasca River, which drains into Lake Athabasca.

Kettle River Lateral Loop – Christina River Section

A total of 16 potential watercourse crossings were identified along the proposed Kettle River Lateral Loop – Christina River Section. The proposed crossings are situated in the Christina River sub-basin. Named watercourses along the proposed Kettle River Lateral Loop – Christina River Section include the Christina River and several unnamed tributaries to the Christina River, the Kettle River and Bohn Lake. The Kettle River is a direct tributary to the Christina River, which drains directly into the Clearwater River.

Compressor Stations

Based on desktop surveys, no potential watercourse crossings were identified in the proposed compressor station footprints. The absence of watercourses in the physical footprint of the compressor stations will be verified during ground and helicopter reconnaissance throughout the summer 2014 open water aquatic habitat assessments.

5.5.2 Fish and Fish Habitat

NWML Loop – Boundary Lake Section

Primarily cyprinid and other forage fish species are expected to occur along the NWML Loop – Boundary Lake Section. Sportfish known to occur in watercourses

crossed by the proposed NWML Loop – Boundary Lake Section include Arctic grayling and northern pike.⁹

Of the fish species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) none are known to occur near the proposed NWML Loop – Boundary Lake Section.¹⁰ Arctic grayling have been previously documented in the Doig River¹¹ and although not currently listed by COSEWIC, the species is on the high-priority candidate list for a detailed assessment.¹² Additional species listed for a detailed assessment include slimy sculpin as a mid-priority candidate and pearl dace as a low-priority candidate.¹³

Provincially, Arctic grayling is the only species known to occur in the Doig River and Little Clear River sub-basins that is listed by AESRD as Sensitive to human activities or natural events.¹⁴ Sensitive species are those that “are not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk” (Alberta Sustainable Resource Development 2010). In addition, Alberta’s Endangered Species Conservation Committee (ESCC) has identified Arctic grayling as a Species of Special Concern indicating that it is “a species that without human intervention may soon become threatened with extinction”.¹⁵

The provincial status of pearl dace is Undetermined as there is “insufficient information, knowledge or data available to reliably evaluate the general status”.¹⁶

NWML Loop – Bear Canyon Section

Sportfish known to occur in watercourses crossed by the proposed NWML Loop – Bear Canyon Section include burbot, bull trout and goldeye.¹⁷

Western Arctic drainage populations of bull trout (i.e., the Peace River) are listed as Special Concern by COSEWIC¹⁸ and have been previously documented in the Ksituan River.¹⁹ No other fish species known to occur near the NWML Loop – Bear Canyon Section are listed by COSEWIC, but some other fish species are listed on the candidate list for a detailed assessment, including: Arctic grayling as a high-priority

⁹ AESRD 2014b

¹⁰ COSEWIC 2014a

¹¹ AESRD 2014b

¹² COSEWIC 2014b

¹³ COSEWIC 2014b

¹⁴ Alberta Sustainable Resource Development 2010

¹⁵ AESRD 2014c

¹⁶ Alberta Sustainable Resource Development 2010

¹⁷ AESRD 2014b

¹⁸ COSEWIC 2014a

¹⁹ AESRD 2014b

candidate; slimy sculpin as a mid-priority candidate; and pearl dace as a low-priority candidate.²⁰

Provincially, bull trout and northern redbelly dace are known to occur in the Peace River Basin, in the vicinity of the proposed loop, and are listed as Sensitive.²¹ Sensitive species are those that “are not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk”.²² Bull trout are also designated as Threatened under the Alberta *Wildlife Act*.²³

GPML Loop No. 2 – McLeod River Section

Sportfish known to occur in watercourses crossed by the proposed GPML Loop No. 2 – McLeod River Section include brook trout, burbot and rainbow trout. Arctic grayling, bull trout and mountain whitefish are also documented within the general Project area.²⁴

Western Arctic drainage populations of bull trout (including the Athabasca River) are listed as Special Concern by COSEWIC,²⁵ and have been previously documented in the Edson River and McLeod River.²⁶ In addition, Athabasca River populations of rainbow trout (i.e., Athabasca rainbow trout) are listed as Endangered by COSEWIC,²⁷ and have been documented in the headwater drainages of the Edson River and McLeod River.²⁸

Provincially, Arctic grayling, bull trout and northern redbelly dace are known to occur in the Athabasca River Basin, in the vicinity of the proposed loop, and are listed by AESRD as Sensitive.²⁹ Sensitive species are those that “are not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk”.³⁰ Native stocks of rainbow trout in the Athabasca River basin have suffered introgression from introduced trout and have a general status of May Be at Risk.³¹ May Be at Risk species are any species that may be at risk of extinction or extirpation, and is, therefore, a candidate for detailed risk assessment. Athabasca rainbow trout and bull trout are designated as Threatened under Alberta’s

²⁰ COSEWIC 2014b

²¹ Alberta Sustainable Resource Development 2010

²² Alberta Sustainable Resource Development 2010

²³ AESRD 2014c

²⁴ AESRD 2014b

²⁵ COSEWIC 2014a

²⁶ AESRD 2014b

²⁷ COSEWIC 2014a

²⁸ AESRD 2014b

²⁹ Alberta Sustainable Resource Development 2010

³⁰ Alberta Sustainable Resource Development 2010

³¹ Alberta Sustainable Resource Development 2010

Wildlife Act. In addition, Arctic grayling are designated Species of Special Concern by Alberta's ESCC.³²

Liege Lateral Loop No. 2 – Pelican Lake Section

Sportfish known to occur in watercourses crossed by the proposed Liege Lateral Loop No. 2 – Pelican Lake Section include mountain whitefish, northern pike, Arctic grayling, bull trout, lake whitefish, burbot, walleye, yellow perch and goldeye.³³

Western Arctic drainage populations of bull trout (i.e., the Athabasca River) are listed as Special Concern by COSEWIC³⁴ and have been previously documented in the Athabasca River.³⁵ Several other fish species are candidates in Alberta for a detailed status assessment by COSEWIC³⁶ and might occur in the Athabasca River Basin in the vicinity of the proposed Liege Lateral Loop No. 2 – Pelican Lake Section, where connectivity and suitable habitat exists (Arctic grayling and lake whitefish are high priority, slimy sculpin and brassy minnow are mid-priority and pearl dace are low priority).

Provincially, bull trout, Arctic grayling and northern redbelly dace are known to occur in the Athabasca River Basin, in the vicinity of the proposed loop, and are listed by AESRD as Sensitive.³⁷ Sensitive species are those that “are not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk”.³⁸ In addition, Alberta's ESCC has identified Arctic grayling as a Species of Special Concern, indicating that it is “a species that without human intervention may soon become threatened with extinction”.³⁹ Bull trout are also designated as Threatened under the Alberta *Wildlife Act*.⁴⁰

Spoonhead sculpin are listed as May Be at Risk in Alberta, indicating that the species “may be at risk of extinction or extirpation and is, therefore, a candidate for detailed risk assessment”.⁴¹ The provincial status of pearl dace, finescale dace and brassy minnow populations is Undetermined as there is “insufficient information, knowledge or data available to reliably evaluate the general status”.⁴²

³² AESRD 2014c

³³ AESRD 2014b

³⁴ COSEWIC 2014a

³⁵ AESRD 2014b

³⁶ COSEWIC 2014b

³⁷ Alberta Sustainable Resource Development 2010

³⁸ Alberta Sustainable Resource Development 2010

³⁹ AESRD 2014c

⁴⁰ AESRD 2014c

⁴¹ Alberta Sustainable Resource Development 2010

⁴² Alberta Sustainable Resource Development 2010

Kettle River Lateral Loop – Christina River Section

Sportfish known to occur in watercourses crossed by the proposed Kettle River Lateral Loop – Christina River Section include northern pike, burbot, Arctic grayling, walleye, yellow perch and goldeye.⁴³

No fish species listed by COSEWIC⁴⁴ are known to occur in the vicinity of the proposed Kettle River Lateral Loop – Christina River Section in the Christina River sub-basin. However, several fish species are candidates in Alberta for a detailed status assessment by COSEWIC⁴⁵ and might occur in the Christina River sub-basin in the vicinity of the proposed Kettle River Lateral Loop – Christina River Section, where connectivity and suitable habitat exists (Arctic grayling is high-priority, slimy sculpin is mid-priority and pearl dace is low-priority).

Provincially, Arctic grayling and northern redbelly dace are known to occur in the Christina River sub-basin, and are listed by AESRD as Sensitive.⁴⁶ Sensitive species are those that “are not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk”.⁴⁷

In addition, Alberta’s ESCC has identified Arctic grayling as a Species of Special Concern, indicating that it is “a species that without human intervention may soon become threatened with extinction”.⁴⁸

The provincial status of both pearl dace and finescale dace is Undetermined as there is “insufficient information, knowledge or data available to reliably evaluate the general status”.⁴⁹

For documented fish presence in the vicinity of the named watercourse crossings traversed by the proposed loops, see Table 5-1.

⁴³ AESRD 2014b

⁴⁴ COSEWIC 2014a

⁴⁵ COSEWIC 2014b

⁴⁶ Alberta Sustainable Resource Development 2010

⁴⁷ Alberta Sustainable Resource Development 2010

⁴⁸ AESRD 2014c

⁴⁹ Alberta Sustainable Resource Development 2010

Table 5-1: Documented Fish Presence at Preliminary Crossings of Named Watercourses

Watercourse Name	Preliminary Location ^{1,2}		Documented Fish Presence in the Vicinity of the Named Watercourses ³
	Northing	Easting	
NWML Loop – Boundary Lake Section			
Mearon Creek	6320771	324835	White sucker and northern pike
Betts Creek	6316195	324317	Brook stickleback, finescale dace, white sucker
Doig River	6312052	324540	Arctic grayling, lake chub, longnose sucker, northern pike, white sucker
Sweeney Creek	6276811	321814	Lake chub, longnose dace, northern pikeminnow, redbelly shiner, slimy sculpin, trout-perch, white sucker
McLean Creek	6267191	321480	Brook stickleback, lake chub, longnose dace, pearl dace and white sucker
NWML Loop – Bear Canyon Section			
Little Clear River	6255820	320189	Brook stickleback, finescale dace, lake chub, longnose sucker, white sucker
Hammelin Creek	6199678	342461	Brook stickleback, burbot, flathead chub, lake chub, longnose dace, longnose sucker, redbelly shiner, spottail shiner, white sucker
Ksituan River	6188356	351726	Bull trout, brook stickleback, burbot, emerald shiner, flathead chub, goldeye, lake chub, longnose dace, longnose sucker, northern redbelly dace, redbelly shiner, spottail shiner, trout-perch, white sucker
GPML Loop No. 2 – McLeod River Section			
Little Sundance Creek	5940170	524720	Brook trout, brook stickleback, finescale dace, lake chub, longnose dace, rainbow trout, spoonhead sculpin, white sucker
Little Sundance Creek	5948385	515223	Brook trout and rainbow trout
Edson River	5957087	506324	Burbot, rainbow trout, white sucker
Liege Lateral Loop No. 2 – Pelican Lake Section			
Livock River	6258087	386605	Brook stickleback, flathead chub, fathead minnow, lake chub, longnose sucker, mountain whitefish, northern pike, pearl dace, slimy sculpin, white sucker
Loon Creek	6232597	394334	Brassy minnow, brook stickleback, fathead minnow, lake chub, northern redbelly dace, pearl dace
Tributary to Loon Creek	6236369	391945	Brassy minnow, brook stickleback, lake chub, longnose dace, longnose sucker
Deadman Creek	6226402	397858	No fish previously captured in the vicinity of the crossing location

Table 5-1: Documented Fish Presence at Preliminary Crossings of Named Watercourses (cont'd)

Watercourse Name	Preliminary Location ^{1,2}		Documented Fish Presence in the Vicinity of the Named Watercourses ³
	Northing	Easting	
Liege Lateral Loop No. 2 – Pelican Lake Section (cont'd)			
Athabasca River	6223011	402821	Arctic grayling, bull trout, brassy minnow, brook stickleback, burbot, cisco, emerald shiner, flathead chub, finescale dace, fathead minnow, goldeye, lake chub, lake whitefish, longnose dace, large sucker, mountain sucker, mountain whitefish, ninespine stickleback, northern redbelly dace, northern pike, pigmy whitefish, pearl dace, round whitefish, river shiner, slimy sculpin, spottail sculpin, spottail shiner, trout-perch, walleye, white sucker, yellow perch
Tributary to Athabasca River	6251573	386695	Brook stickleback, lake chub, longnose sucker, pearl dace
Boivin Creek	6217017	404101	Brook stickleback, lake chub, longnose sucker, pearl dace, white sucker
Kettle River Lateral Loop – Christina River Section			
Christina River	6194722	514061	Arctic grayling, brook stickleback, burbot, flathead chub, fathead minnow, goldeye, lake chub, longnose dace, northern pike, slimy sculpin, spottail shiner, trout-perch, walleye, white sucker, yellow perch
Note:			
1. Final locations, crossing method and timing will be subject to engineering and environmental site evaluations, geotechnical investigations, Aboriginal and stakeholder engagement, land acquisitions and consultation with regulatory authorities.			
2. The coordinates in this table are based on North American Datum (NAD) 83 Universal Transverse Mercator (UTM) Zone 11 and 12.			
3. AESRD. 2014b. <i>Fisheries and Wildlife Internet Mapping Tool</i> . ⁵⁰			

5.5.3 Watercourse Crossings

All of the proposed watercourse crossings are mapped or unmapped Class C watercourses, depending on the presence of bed and banks at the time of the aquatic habitat assessment. All potential watercourse crossings along the NWML Loop – Boundary Lake Section, NWML Loop – Bear Canyon Section, Liege Lateral Loop No. 2 – Pelican Lake Section and Kettle River Lateral Loop – Christina Lake Section have Restricted Activity Periods (RAPs) from April 16 to July 15.^{51,52,53,54,55} All potential watercourse crossings along the GPML Loop No. 2 – McLeod River Section have RAPs from September 1 to July 15 or September 1 to June 30.^{56,57,58} In-

⁵⁰ AESRD 2014b
⁵¹ Alberta Government 2013a
⁵² Alberta Government 2013b
⁵³ Alberta Environment 2006a
⁵⁴ Alberta Environment 2006b
⁵⁵ Alberta Environment 2006c
⁵⁶ Alberta Government 2013a

stream fish and wildlife timing windows of low risk for unmapped watercourses and drainages will be determined by fish presence, fisheries management objectives where defined, and applicable provincial criteria. All unmapped watercourses and drainages will be visited and assessed during the summer and fall 2014 open water season to confirm habitat sensitivity

Preliminary watercourse crossing locations, fish presence, preliminary pipeline and vehicle access crossing methods, and a self-assessment of the potential for serious harm after mitigation to commercial, recreational and aboriginal (CRA) fisheries will be provided during the regulatory process. Final locations, crossing method and timing will be subject to engineering and environmental site evaluations, geotechnical investigations, Aboriginal and stakeholder engagement, land acquisitions and consultation with regulatory authorities.

All watercourse crossings will implement mitigation including Fisheries and Oceans Canada's (DFO's) *Measures to Avoid Causing Harm to Fish and Fish Habitat*, and Alberta Environment and Sustainable Resource Development's (AESRD) Code of Practice to avoid and minimize potential effects on fish and fish habitat.

Where self-assessment of the potential for serious harm after mitigation determines that a Section 35(2) authorization under the *Fisheries Act* may be required, an application will be made pursuant to the *NEB-DFO Memorandum of Understanding* and in compliance with the requirements of the *Fisheries Act*.

5.5.4 Watercourse Crossing Methods

NGTL selects crossing locations and techniques using industry-accepted design and installation practices. This selection process reflects site-specific assessments and fisheries protection measures to avoid serious harm to fish.

The crossing locations and methods will be updated as design and construction planning progresses to reflect, among other things:

- geotechnical conditions
- environmental field assessments
- consultation with regulatory agencies, Aboriginal communities and other stakeholder groups
- actual field conditions during construction

⁵⁷ Alberta Government 2013b

⁵⁸ Alberta Environment 2006a

Geotechnical terrain assessments are underway to identify any potential slope stability issues and the geotechnical conditions at select watercourse crossing locations.

5.5.5 Navigation and Navigation Safety

Use of some navigable waters might be affected by trenched pipeline crossing methods and by installation of portable bridges and other temporary works. Many of the watercourses and waterbodies that will be crossed by the proposed loops are anticipated to be seasonal or too small to support navigation, including for recreational purposes.

The following named watercourses are expected to be potentially navigable, along with other unnamed tributaries that flow into these named watercourses:

- Mearon Creek
- Betts Creek
- Doig River
- Sweeney Creek
- McLean Creek
- Little Clear River
- Hammelin Creek
- Kistuan River
- Livock River
- Loon Creek
- Athabasca River
- Deadman Creek
- Boivin Creek
- Christina River
- Edson River
- Little Sundance Creek

The NEB considers navigability and is responsible for granting leave under the *NEB Act* for NEB-regulated projects. The Athabasca River is the only watercourse listed above that is a scheduled waterway under the *Navigation Protection Act* (NPA). While the remaining above-named rivers are not included in the Schedule of Navigable Waters under the NPA, they could possibly support navigation or be considered “navigable” under Section 109 of the *NEB Act*.

Ground and air field investigations during summer 2014 assessed the navigability of waterways crossed by the Project. Consultation regarding navigation of waterways in the Project area is also underway as part of the Aboriginal and stakeholder engagement programs.

5.5.6 Groundwater

The AESRD Water Well Database identified 63 water wells located in a 1000-m-wide band extending from the centre of the construction ROW (i.e., 500 m on both sides of the proposed pipeline loops) and 500 m from the perimeter of the compressor station boundaries, all listed for industrial, investigation and domestic use.⁵⁹

In addition, field investigations will identify the locations of aquifers and water supply wells close to the Project, and if warranted, appropriate groundwater protection measures will be developed and implemented during construction and operations. In addition, testing of groundwater wells located within 250 m of the construction right-of-way will occur pre and post-construction.

5.5.7 Wetlands

Wetland Environmental Setting

NWML Loop – Boundary Lake Section

The National Wetland Working Group (NWWG) developed a broad framework for designating regions in Canada with similar wetland types.⁶⁰ The NWML Loop – Boundary Lake Section crosses the Continental High Boreal and Continental Mid-Boreal Wetland Regions of Canada.⁶¹ Characteristic Continental High Boreal wetlands consist of treed bogs and fens on broad flats and in confined basins with average peat depths of 2 to 3 m. Swamp and marsh wetlands occur in agricultural areas and along edges of some streams and lakes.⁶² Continental Mid-Boreal wetlands are primarily bogs and fens with average peat depths of 4 m. Marsh wetlands can be found along gently sloping lakeshores.⁶³

Natural Resources Canada estimates the percentage of freshwater wetlands for broad regions in Canada through the integration of data from several wetland-specific sources.⁶⁴ The NWML Loop – Boundary Lake Section crosses lands that range from 10-25% to greater than 65% freshwater wetland cover.⁶⁵

Natural regions and natural subregions, developed by the Natural Regions Committee, constitute broad levels of ecologically based landscape classification in Alberta.⁶⁶

⁵⁹ AESRD 2014a

⁶⁰ NWWG 1988

⁶¹ Government of Canada 1986

⁶² Government of Canada 1986

⁶³ Government of Canada 1986

⁶⁴ Natural Resources Canada 2009b

⁶⁵ Natural Resources Canada 2009b

⁶⁶ Natural Regions Committee 2006

The NWML Loop – Boundary Lake Section crosses the Lower and Upper Boreal Highlands natural subregions of the Boreal Forest Natural Region (see Figure 5-1).⁶⁷ Wetlands occupy approximately 35% of the Lower Boreal Highlands Natural Subregion; however, local percentages range from 20-60%. Common wetlands include treed, shrubby or graminoid fens in depressions, seepage zones or level areas.

Wetlands occupy approximately 30% of the Upper Boreal Highlands Natural Subregion, and include treed and shrubby bogs and fens.⁶⁸

The NWML Loop – Boundary Lake Section is located in the Green Area of Alberta.

NWML Loop – Bear Canyon Section

The NWML Loop – Bear Canyon Section crosses the Continental Mid-Boreal Wetland Region of Canada.⁶⁹ Continental Mid-Boreal wetlands are primarily bogs and fens with average peat depths of 4 m. Marsh wetlands can be found along gently sloping lakeshores.⁷⁰

The NWML Loop – Bear Canyon Section crosses lands that range from 5-10% freshwater wetland cover.⁷¹

The NWML Loop – Bear Canyon Section crosses the Dry Mixedwood Natural Subregion of the Boreal Forest Natural Region and the Lower Foothills Natural Subregion of the Foothills Natural Region (see Figure 5-1).⁷² Wetlands occupy approximately 15% of the Dry Mixedwood Natural Subregion and commonly include treed, shrubby or sedge-dominated fens.

Wetlands occupy approximately 20% of the Lower Foothills Natural Subregion, often contain peat accumulations up to 4 m thick and are predominantly treed fens with some bogs and open fens.⁷³

The NWML Loop – Bear Canyon Section is located in the Green and White Areas of Alberta.

GPML Loop No. 2 – McLeod River Section

The GPML Loop No. 2 – McLeod River Section crosses the Continental Mid-Boreal Wetland Region of Canada.⁷⁴ Continental Mid-Boreal wetlands are primarily bogs

⁶⁷ Natural Regions Committee 2006

⁶⁸ Natural Regions Committee 2006

⁶⁹ Government of Canada 1986

⁷⁰ Government of Canada 1986

⁷¹ Natural Resources Canada 2009b

⁷² Natural Regions Committee 2006

⁷³ Natural Regions Committee 2006

and fens with average peat depths of 4 m. Marsh wetlands can be found along gently sloping lakeshores.⁷⁵

The GPML Loop No. 2 – McLeod River Section crosses the Upper Foothills and the Lower Foothills natural subregions of the Foothills Natural Region (see Figure 5-1).⁷⁶ Wetlands occupy approximately 10% of the Upper Foothills Natural Subregion, and are typically confined to major valleys and commonly include treed, shrubby or sedge-dominated fens. Wetlands occupy approximately 20% of the Lower Foothills Natural Subregion, often contain peat accumulations up to 4 m thick, and are predominantly treed fens with some bogs and open fens.⁷⁷

The GPML Loop No. 2 – McLeod River Section is located in the Green and White Areas of Alberta.

Liege Lateral Loop No. 2 – Pelican Lake Section and Kettle River Lateral Loop – Christina River Section

The Liege Lateral Loop No. 2 – Pelican Lake Section and the Kettle River Lateral Loop – Christina River Section cross the Continental High Boreal Wetland Region of Canada.⁷⁸ Characteristic Continental High Boreal wetlands consist of treed bogs and fens on broad flats and in confined basins with average peat depths of 2 to 3 m. Swamp and marsh wetlands occur in agricultural areas and along edges of some streams and lakes.⁷⁹

The Liege Lateral Loop No. 2 – Pelican Lake Section and the Kettle River Lateral Loop – Christina River Section cross lands with greater than 65% freshwater wetland cover.⁸⁰

The Liege Lateral Loop No. 2 – Pelican Lake Section and the Kettle River Lateral Loop – Christina River Section cross the Central Mixedwood Natural Subregion of the Boreal Forest Natural Region (see Figure 5-1).⁸¹ Wetlands occupy approximately 40% of the Central Mixedwood Natural Subregion and commonly include woody fens and marshes.⁸²

The Liege Lateral Loop No. 2 – Pelican Lake and Kettle River Lateral Loop – Christina River Sections are located in the Green Area of Alberta.

⁷⁴ Government of Canada 1986
⁷⁵ Government of Canada 1986
⁷⁶ Natural Regions Committee 2006
⁷⁷ Natural Regions Committee 2006
⁷⁸ Government of Canada 1986
⁷⁹ Government of Canada 1986
⁸⁰ Natural Resources Canada 2009b
⁸¹ Natural Regions Committee 2006
⁸² Natural Regions Committee 2006

Alces River, Hidden Lake and Woodenhouse Compressor Stations

All four proposed compressor stations are located in the Continental High Boreal and Continental Mid-Boreal Wetland Regions of Canada.⁸³ Characteristic Continental High Boreal wetlands consist of treed bogs and fens on broad flats and in confined basins with average peat depths of 2 to 3 m. Swamp and marsh wetlands occur in agricultural areas and along edges of some streams and lakes.⁸⁴ Continental Mid-Boreal wetlands are primarily bogs and fens with average peat depths of 4 m. Marsh wetlands can be found along gently sloping lakeshores.⁸⁵

The proposed compressor stations are located on land that typically ranges from 10-25%, to more than 65% freshwater wetland cover.⁸⁶ The proposed stations are located in the Lower Boreal Highlands Natural Subregion of the Boreal Forest Natural Region (see Figure 5-1).⁸⁷ Wetlands occupy approximately 35% of the Lower Boreal Highlands Natural Subregion however local percentages range from 20-60%. Common wetlands include treed, shrubby or graminoid fens in depressions, seepage zones or level areas.⁸⁸

The Alces River, Hidden Lake and Woodenhouse compressor stations are located in the Green Area of Alberta.

Otter Lake Compressor Station

The Otter Lake Compressor Station crosses the Continental Mid-Boreal Wetland Region of Canada.⁸⁹ Continental Mid-Boreal wetlands are primarily bogs and fens with average peat depths of 4 m. Marsh wetlands can be found along gently sloping lakeshores.⁹⁰

The Otter Lake Compressor Station is located on land that typically ranges from 25-40% freshwater wetland cover.⁹¹

The Otter Lake Compressor Station is located in the Lower Boreal Highlands Natural Subregion of the Boreal Forest Natural Region (see Figure 5-1).⁹² Wetlands occupy approximately 35% of the Lower Boreal Highlands; however, local percentages range

⁸³ Government of Canada 1986

⁸⁴ Government of Canada 1986

⁸⁵ Government of Canada 1986

⁸⁶ Natural Resources Canada 2009b

⁸⁷ Natural Regions Committee 2006

⁸⁸ Natural Regions Committee 2006

⁸⁹ Government of Canada 1986

⁹⁰ Government of Canada 1986

⁹¹ Natural Resources Canada 2009b

⁹² Natural Regions Committee 2006

from 20-60%. Common wetlands include treed, shrubby or graminoid fens in depressions, seepage zones or level areas.⁹³

The Otter Lake Compressor Station is located in the Green Area of Alberta.

Mitigation Hierarchy

Where feasible, the Project has been aligned to reduce potential effects on wetlands, and to meet the intent of the *Federal Policy on Wetland Conservation*⁹⁴ and the new *Alberta Wetland Policy*⁹⁵ by implementing a routing decision framework that takes into consideration the following:

- Avoid wetlands, where possible
- Reduce length crossing environmentally sensitive areas, such as protected areas or areas containing vegetation and wildlife habitat for species with special conservation status
- Where practical, follow existing linear infrastructure (e.g., pipelines, power lines and roads)
- Use the shortest route practical
- Where avoidance is not technically or economically feasible, implement construction and reclamation mitigation measures, and implement a monitoring program for wetlands that could not be avoided to document wetland function recovery following construction

The Project will overlap existing surface dispositions, where possible. Where wetlands are encountered, NGTL will implement construction and reclamation mitigation measures to minimize potential adverse effects on wetlands.

5.6 TERRESTRIAL ENVIRONMENT

5.6.1 Terrain

Terrain (surficial geology or surficial material) influences terrain stability, soil erosion potential, soil properties for construction or infrastructure, soil properties for supporting vegetation, and surface water infiltration.

⁹³ Natural Regions Committee 2006

⁹⁴ Environment Canada 1991

⁹⁵ Alberta Government 2013c

NWML Loop – Boundary Lake Section

The NWML Loop – Boundary Lake Section is primarily located in the Lower Boreal Highlands Natural Subregion with a portion of the pipeline loop traversing the Upper Boreal Highlands Natural Subregion (see Figure 5-1).

The topography along the portion of the proposed pipeline located in the Lower Boreal Highlands Natural Subregion is composed of gently to strongly sloping lower elevations of the Northern Alberta Uplands, with some undulating and hummocky upland areas. The underlying bedrock consists of a mixture of Cretaceous marine shales and sandstones.⁹⁶ The Upper Boreal Highlands Natural Subregion is characterized by steeply sloping dissected plateaus and undulating and hummocky upper plateau surfaces.⁹⁷

NWML Loop – Bear Canyon Section

The NWML Loop – Bear Canyon Section is primarily located in the Lower Foothills Natural Subregion with a portion of the pipeline loop traversing the Dry Mixedwood Natural Subregion (see Figure 5-1).

The portion of the proposed pipeline loop located in the Lower Foothills Natural Subregion is characterized by undulating to strongly rolling dissected plateaus, and is underlain by Upper Cretaceous sandstones and shales.⁹⁸ The portion of the proposed pipeline loop located in the Dry Mixedwood Natural Subregion is composed of level to gently rolling plains, and is primarily underlain by Upper Cretaceous sandstones and shales.⁹⁹

GPML Loop No. 2 – McLeod River Section

The GPML Loop No. 2 – McLeod River Section is primarily located in the Lower Foothills Natural Subregion with a portion of the pipeline traversing the Upper Foothills Natural Subregion (see Figure 5-1).

Both the Lower and Upper Foothills natural subregions are characterized by undulating to strongly rolling dissected plateaus, and are underlain by Upper Cretaceous sandstones and shales.¹⁰⁰

⁹⁶ Natural Regions Committee 2006

⁹⁷ Natural Regions Committee 2006

⁹⁸ Natural Regions Committee 2006

⁹⁹ Natural Regions Committee 2006

¹⁰⁰ Natural Regions Committee 2006

Liege Lateral Loop No. 2 – Pelican Lake Section and Kettle River Lateral Loop – Christina River Section

The Liege Lateral Loop No. 2 – Pelican Lake Section and the Kettle River Lateral Loop – Christina River Section are located in the Central Mixedwood Natural Subregion (see Figure 5-1). The Central Mixedwood Natural Subregion is characterized by gently undulating plains with minor inclusion of hummocky uplands.

The underlying bedrock in this area is composed mainly of Devonian limestones, shales and siltstones.¹⁰¹

Alces River, Hidden Lake, Otter Lake and Woodenhouse Compressor Stations

All four proposed compressor stations are located in the Lower Boreal Highlands Natural Subregion, which is characterized by gently to strongly sloping lower elevations of the Northern Alberta Uplands, with some undulating and hummocky upland areas (see Figure 5-1). The underlying bedrock consists of a mixture of Cretaceous marine shales and sandstones.¹⁰²

5.6.2 Soils

In the Foothills Natural Region, upland soils at lower elevations are mainly Orthic and Brunisolic Gray Luvisols and Gleysols and Organic (mainly Mesozoic) soils are associated with wet conditions along lower slopes and in valley bottoms. In the Boreal Forest Natural Region, Brunisols are common on well to rapidly drained fluvial or aeolian materials with Gleysols and Organic soils associated with wetlands and poorly drained soils and Luvisolic soils occurring on well to imperfectly drained forested sites.

Most Project components are located in the Green Area of Alberta, which is primarily forested land. However, the NWML Loop – Bear Canyon Section and the GPML Loop No. 2 – McLeod River Section components of the Project are located in the White Area of Alberta. Field programs are being conducted to characterize the soils along the proposed loop located in the White Area and support the development of Project-specific soil-handling methods. Additional information will be provided in the ESA.

NWML Loop – Boundary Lake Section

Upland soils located in the Lower Boreal Highlands Natural Subregion (see Figure 5-1) are dominated by Orthic Gray Luvisols with gleyed subgroups commonly present. On steep erosional slopes, Regosols typically occur.

¹⁰¹ Natural Regions Committee 2006

¹⁰² Natural Regions Committee 2006

The dominant organic soils in fens consist of Typic and Terric Mesisols, whereas bogs typically consist of Fibric Mesisols and occasional Organic Cryosols. In addition, Peaty Gleysols are common throughout the Lower Boreal Highlands Natural Subregion.¹⁰³

The dominant upland soils in the Upper Boreal Highlands Natural Subregion (see Figure 5-1) are characterized by Orthic Gray Luvisols, with significant occurrences of Gleyed Gray Luvisols, Eluviated and Gleyed Eutric Brunisols, and Brunisolic Gray Luvisols. Fens are typically composed of Mesisols, whereas Fibric Mesisols and Organic Cryosols are associated with bogs. Rego and Peaty Gleysols occur on wet seepage sites.¹⁰⁴

NWML Loop – Bear Canyon Section

Soils along the NWML Loop – Bear Canyon Section are dominated by imperfectly drained Gleyed Gray Luvisols developed on undulating deposits of fine-textured till and lacustro-till material. Inclusions of Gleyed Dark Gray Luvisols are also present on fine-textured lacustro-till deposits.¹⁰⁵ Minor extents of poorly drained Orthic Luvic Gleysols formed on very fine-textured glaciolacustrine material may also be encountered along the proposed pipeline loop. Very poorly drained Typic Mesisols are representative of fen and sphagnum peat deposits, and are commonly found in depressions and wet nearly level areas. Recently deposited coarse textured or gravelly fluvial material may also be expected at creek crossings, characterized by poorly developed Regosolic soils.

Because the NWML – Bear Canyon Section is located in the Green and White Areas of Alberta, a detailed soil survey will be completed along the proposed pipeline loop to characterize the soil present. The information collected during field programs will be used to identify appropriate soil handling procedures. The soils encountered will be assessed for three-lift soil handling requirements using industry-standard guidelines.

GPML Loop No. 2 – McLeod River Section

Soils along the GPML Loop No. 2 – McLeod River Section are dominated by imperfectly drained Gleyed Gray Luvisols developed on undulating deposits of fine-textured till and lacustro-till material. Inclusions of Gleyed Dark Gray Luvisols are also present on fine-textured lacustro-till deposits.¹⁰⁶ Minor extents of poorly drained Orthic Luvic Gleysols formed on very fine-textured glaciolacustrine material may also be encountered along the proposed pipeline loop.

¹⁰³ Natural Regions Committee 2006

¹⁰⁴ Natural Regions Committee 2006

¹⁰⁵ Alberta Soil Information Centre 2014

¹⁰⁶ Alberta Soil Information Centre 2014

Very poorly drained Typic Mesisols are representative of fen and sphagnum peat deposits, and are commonly found in depressions and wet, nearly level areas. Recently deposited coarse textured or gravelly fluvial material may also be expected at creek crossings, characterized by poorly developed Regosolic soils.

Liege Lateral Loop No. 2 – Pelican Lake Section and Kettle River Lateral Loop – Christina River Section

Mineral soils located in the Central Mixedwood Natural Subregion (see Figure 5-1) are predominantly Gray Luvisols; however, Dystric and Eutric Brunisols are associated with coarse textured sands.

Many Luvisolic soils located on low-relief landforms are imperfectly drained and gleyed. Mesisols are the dominant Organic soils occurring under fens and bogs, with Terric subgroups commonly occurring.¹⁰⁷

Alces River, Hidden Lake, Otter Lake and Woodenhouse Compressor Stations

All four proposed compressor stations are located in the Lower Boreal Highlands Natural Subregion (see Figure 5-1). Upland soils in this Subregion are dominated by Orthic Gray Luvisols with gleyed subgroups commonly present. Typic and Terric Mesisols are the dominant organic soils associated with fens, whereas Fibric Mesisols and occasional Organic Cryosols are associated with bogs. In addition, Peaty Gleysols are common throughout the Lower Boreal Highlands Natural Subregion.¹⁰⁸

5.6.3 Vegetation

NWML Loop – Boundary Lake Section

The NWML Loop – Boundary Lake Section is primarily located in the Lower Boreal Highlands Natural Subregion with a portion of the pipeline loop traversing the Upper Boreal Highlands Natural Subregion (see Figure 5-1).

Landscapes in the Lower Boreal Highlands Natural Subregion are characterized by diverse mixedwood forests on moist lower slopes of northern hill systems and extensive wetlands at slope bases and on adjacent lowlands. Forests are a mix of aspen, balsam poplar, black spruce, white spruce, white birch with hybrids of lodgepole pine and jackpine occurring specifically on slopes. Treed, shrubby or graminoid fens occur in depressions, seepage zones or level areas.

¹⁰⁷ Natural Regions Committee 2006

¹⁰⁸ Natural Regions Committee 2006

This natural subregion has slightly colder winters and warmer summers than the higher-elevation Upper Boreal Highlands Natural Subregion and is moister and cooler than the adjacent Central Mixedwood and Dry Mixedwood natural subregions.¹⁰⁹

The Upper Boreal Highlands Natural Subregion is characterized by upper slopes and plateaus of the Buffalo head, Naylor and Clear hills, and the Birch Mountains. The climate is defined by shorter, cooler summers, and cold winters. The vegetation is composed of coniferous forests and extensive wetlands in low-lying portions of the plateaus. Forests are predominated by hybrids of lodgepole pine and jackpine, or white spruce and black spruce. Common understorey species include Labrador tea, bog cranberry, bunchberry, dewberry, twinflower and feathermosses. Wetlands are often extensive fens and bogs that are dominated by black spruce often underlaid by permafrost.¹¹⁰

Ecological communities and vegetation species of concern include species designated by the *Species at Risk Act* (SARA), COSEWIC or the *Alberta Wildlife Act* and those species listed on the Tracking and Watch lists of the Alberta Conservation Information Management System (ACIMS).

No plant species listed under SARA, COSEWIC or the *Alberta Wildlife Act* are known to occur in the Upper or Lower Boreal Highlands natural subregions.¹¹¹ ACIMS has not reported any previous occurrences of plant species with SARA, COSEWIC or *Alberta Wildlife Act* designations within 5 km of this Project component.¹¹² Furthermore, ACIMS did not report any previous occurrences of ACIMS-tracked plant species or ecological communities within 5 km of this Project component.¹¹³

NWML Loop – Bear Canyon Section

The NWML Loop – Bear Canyon Section is primarily located in the Lower Foothills Natural Subregion with portions of the pipeline loop traversing the Dry Mixedwood Natural Subregion (see Figure 5-1).

Natural landscapes in the Lower Foothills Natural Subregion are characterized by rolling, till-covered plateaus forested by mesic, closed canopy mixed stands of aspen, lodgepole pine, white spruce and balsam poplar. Common understorey species on mesic sites include green alder, low-bush cranberry, prickly rose, wild sarsaparilla, dewberry, fireweed and bluejoint.¹¹⁴

¹⁰⁹ Natural Regions Committee 2006

¹¹⁰ Natural Regions Committee 2006

¹¹¹ ACIMS 2014a

¹¹² ACIMS 2014b

¹¹³ ACIMS 2014b

¹¹⁴ Natural Regions Committee 2006

The Dry Mixedwood Natural Subregion is the most southern and the warmest of the Boreal Forest subregions in Alberta. Aspen forests with understories dominated by prickly rose, low-bush cranberry, beaked hazelnut and Canada buffaloberry are typical of the uplands. Treed, shrubby or sedge-dominated fens are common in wet areas. Jackpine typically dominates dry, well-drained areas.¹¹⁵

There are no plant species listed under *SARA*, COSEWIC or the *Alberta Wildlife Act* known to occur in the Lower Foothills or Dry Mixedwood natural subregions.¹¹⁶ ACIMS did not report any previous occurrences of plant species with *SARA*, COSEWIC or *Alberta Wildlife Act* designations within 5 km of this Project component.¹¹⁷ ACIMS reported four previous occurrences of provincially tracked vegetation species within 5 km of this Project component: two liverworts, one lichen and one vascular plant.¹¹⁸

GPML Loop No. 2 – McLeod River Section

The GPML Loop No. 2 – McLeod River Section is primarily located in the Lower Foothills Natural Subregion with a portion of the pipeline loop traversing the Upper Foothills Natural Subregion (see Figure 5-1).

Natural landscapes in the Lower Foothills Natural Subregion are characterized by rolling, till-covered plateaus forested by mesic, closed canopy mixed stands of aspen, lodgepole pine, white spruce and balsam poplar. Common understorey species on mesic sites include green alder, low-bush cranberry, prickly rose, wild sarsaparilla, dewberry, fireweed and bluejoint.¹¹⁹

Natural landscapes in the Upper Foothills Natural Subregion are characterized by rolling, till-covered plateaus forested by mesic, closed canopy coniferous forests of lodgepole pine, Douglas fir and white spruce, as well as grasslands. Common understorey species include tall huckleberry, dwarf bramble, grouseberry, bearberry, Labrador tea, bracted honeysuckle, cow parsnip and common blueberry.¹²⁰

There are two plant species listed under *SARA*, COSEWIC or the *Alberta Wildlife Act* known to occur in the Lower Foothills or Upper Foothills natural subregions: white bark pine and limber pine.¹²¹ ACIMS did not report any previous occurrences

¹¹⁵ Natural Regions Committee 2006

¹¹⁶ ACIMS 2014a

¹¹⁷ ACIMS 2014b

¹¹⁸ ACIMS 2014b

¹¹⁹ Natural Regions Committee 2006

¹²⁰ Natural Regions Committee 2006

¹²¹ ACIMS 2014a

of plant species with *SARA*, COSEWIC or Alberta *Wildlife Act* designations within 5 km of this Project component.¹²²

ACIMS reported fourteen previous occurrences of provincially tracked vegetation species within 5 km of this Project component: two liverworts, four lichen and seven vascular plants.¹²³

Liege Lateral Loop No. 2 – Pelican Lake Section and Kettle River Lateral Loop – Christina River Section

The Liege Lateral Loop No. 2 – Pelican Lake Section and the Kettle River Lateral Loop – Christina River Section are located in the Central Mixedwood Natural Subregion (see Figure 5-1).

The Central Mixedwood Natural Subregion is the largest natural subregion in Alberta and is characterized by upland forests and wetlands on level to gently undulating plains. Upland forests are a mosaic of aspen, mixedwood and white spruce. Common understorey species include low-bush cranberry, prickly rose, green alder, Canada buffaloberry, hairy wild rye, bunchberry, wild sarsaparilla and dewberry. Jackpine stands occur on coarser materials. Wetlands are often extensive and are dominated by black spruce fens and bogs.¹²⁴

No plant species listed under *SARA*, COSEWIC or the Alberta *Wildlife Act* are known to occur in the Central Dry Mixedwood Natural Subregion.¹²⁵ ACIMS did not report any previous occurrences of plant species with *SARA*, COSEWIC or Alberta *Wildlife Act* designations within 5 km of these Project components.¹²⁶ ACIMS reported 55 previous occurrences of provincially tracked vegetation species within 5 km of the Liege Lateral Loop No. 2 – Pelican Lake Section: 5 liverworts, 43 lichens, 1 moss and 6 vascular plants.¹²⁷ ACIMS reported 1 lichen within 5 km of the Kettle River Lateral Loop – Christina River Section.¹²⁸

Alces River, Hidden Lake, Otter Lake and Woodenhouse Compressor Stations

The proposed compressor stations are located in the Lower Boreal Highlands Natural Subregion (see Figure 5-1). Typical vegetation communities in this Natural Subregion are discussed in the previous subsections.

¹²² ACIMS 2014b

¹²³ ACIMS 2014b

¹²⁴ Natural Regions Committee 2006

¹²⁵ ACIMS 2014a

¹²⁶ ACIMS 2014b

¹²⁷ ACIMS 2014b

¹²⁸ ACIMS 2014b

ACIMS did not report any previous occurrences of plant species with *SARA*, COSEWIC or Alberta *Wildlife Act* designations within 5 km of these Project components.¹²⁹ ACIMS reported no ecological communities or vegetation species of concern within 5 km of the Alces River Compressor Station, one vascular plant within 5 km of the Hidden Lake Compressor Station, one vascular plant within 5 km of the Otter Lake Compressor Station and one lichen within 5 km of the Woodenhouse Compressor Station.¹³⁰

All Project Components

Vegetation surveys were conducted from August 19 to 31, 2014 to identify ecological communities and vegetation species of conservation concern, and non-native species that might be directly or indirectly affected by the Project.

Mitigation measures for vegetation will be developed based on the results of the desktop/literature review, fieldwork, consultation with regulators and engagement with Aboriginal communities.

5.6.4 Wildlife

Provincially Identified Wildlife Areas

A summary of provincially identified wildlife areas in relation to the proposed Project is provided below.¹³¹

NWML Loop – Boundary Lake Section

The NWML Loop – Boundary Lake Section is located in the Chinchaga caribou range for approximately 40 km (NE 17-94-12 W6M to NE 19-90-12 W6M). AESRD recommends avoiding initiating construction activities within a timing window of least risk between February 15 to July 15 in caribou ranges to reduce impacts to pregnant cows and their calves.¹³² NGTL will employ an “early in/early out” approach to reduce disturbance of caribou by initiating activities as early as possible in the winter and working expeditiously to limit late winter activities.

This proposed pipeline loop is located in a Key Wildlife and Biodiversity Zone for approximately 9 km (SE 7-90-12 W6M to NE 7-89-12 W6M). Key Wildlife and Biodiversity Zones were established to protect the integrity of ungulate wintering areas, river corridors and biodiversity areas where species tend to concentrate, and have a restricted activity period of January 15 to April 30.¹³³

¹²⁹ ACIMS 2014b

¹³⁰ ACIMS 2014b

¹³¹ AESRD 2014d

¹³² Government of Alberta 2013

¹³³ Government of Alberta 2013

This proposed pipeline loop is located in a Grizzly Bear Zone (Secondary) for approximately 53 km (NE 17-91-12 W6M to NE 1-86-13 W6M). In addition, the proposed pipeline loop is located in Special Access Zone for approximately 8 km (NE 7-87-12 W6M to NE 24-86-13 W6M).

NWML Loop – Bear Canyon Section

This proposed pipeline loop is located in the 800 m buffer of a provincially identified trumpeter swan waterbody for approximately 1.9 km (NW 8-80-10 W6M to NW 4-80-10 W6M).

GPML Loop No. 2 – McLeod River Section

This proposed pipeline loop is located in the vicinity of two provincially identified trumpeter swan waterbodies: one for approximately 1,900 m (NE 16-53-18 W5M and SE 21-53-18 W5M); and the other for approximately 700 m (SW 20-54-19 W5M, SW 29-54-19 W5M and SE 30-54-19 W5M). The recommended setback buffer for trumpeter swan nests is 800 m.

Liege Lateral Loop No. 2 – Pelican Lake Section

The Liege Lateral Loop No. 2 – Pelican Lake Section located in the West Side of the Athabasca River (WSAR) caribou range for approximately 33 km (SW 32-85-18 W4M to SE 10-84-18 W4M and SE 2-84-18 W4M to NE 28-82-17 W4M) and the Agnes caribou range for approximately 9 km (NW 14-82-17 W4M to NE 30-81-16 W4M). AESRD recommends avoiding initiating construction activities within a timing window of least risk between February 15 to July 15 in caribou ranges to reduce impacts on pregnant cows and their calves.¹³⁴ NGTL will employ an “early in/early out” approach to reduce disturbance in Key Wildlife and Biodiversity Zones by initiating activities as early as possible in the winter and working expeditiously to limit late winter activities.

This proposed pipeline loop is located in a Key Wildlife and Biodiversity Zone associated with the Athabasca River for approximately 5 km (NE 28-82-17 W4M to NW 14-82-17 W4M) and the House River for approximately 120 m (9-30-81-16 W4M). Key Wildlife and Biodiversity Zones were established to protect the integrity of ungulate wintering areas, river corridors and biodiversity areas where species tend to concentrate, and have a restricted activity period of January 15 to April 30.^{135,136}

¹³⁴ Government of Alberta 2013

¹³⁵ Government of Alberta 2013

¹³⁶ Government of Alberta 2013

Kettle River Lateral Loop – Christina River Section

This proposed pipeline loop is located in a Key Wildlife and Biodiversity Zone associated with the Christina River for approximately 3 km (NE 35-79-6 W4M to NE 25-79-6 W4M). Key Wildlife and Biodiversity Zones were established to protect the integrity of ungulate wintering areas, river corridors and biodiversity areas where species tend to concentrate, and have a restricted activity period of January 15 to April 30.¹³⁷

Alces River Compressor Station and Woodenhouse Compressor Station

The proposed Alces River and Woodenhouse compressor stations are not located in or adjacent to any provincially identified wildlife areas.

Hidden Lake Compressor Station

The proposed Hidden Lake compressor station is located in caribou range for the Chinchaga herd. The compressor station is located adjacent to an existing all-weather access road.

Otter Lake Compressor Station

The proposed Otter Lake compressor station is located in a Key Wildlife and Biodiversity Zone associated with the Cadotte River. The compressor station is located adjacent to an existing all-weather access road.

Wildlife with Special Conservation Status

Based on a preliminary desktop review, wildlife species with special conservation status that could potentially occur in the vicinity of the proposed pipeline loops are listed in Table 5-2, and in the vicinity of the proposed compressor stations, in Table 5-3.

Wildlife field work will be conducted in the fourth quarter of 2014 and will continue until 2015. It will focus on the identification of habitat features (e.g., stick nests, mineral licks) and habitat suitability to support species with special conservation status in the area of the proposed Project that might be affected by Project construction and operations. Appropriately timed wildlife surveys will be conducted in 2015. Mitigation measures for wildlife and their site-specific habitat features will be developed based on the results of the desktop/literature review, field surveys, consultation with regulators, and engagement with Aboriginal communities.

¹³⁷ Government of Alberta 2013

**Table 5-2: Potential Wildlife Species with Conservation Status
in the Vicinity of the Proposed Pipeline Loops**

Common Name	Status Designation	NWML Loop – Boundary Lake Section	NWML Loop – Bear Canyon Section	GPML Loop No. 2 – McLeod River Section	Liege Lateral Loop No. 2 – Pelican Lake Section	Kettle River Lateral Loop – Christina River Section
Mammals						
Grizzly Bear	Special Concern ¹ Threatened ²	√	√	√	-	-
Little Brown Myotis	Endangered ¹	√	√	√	√	√
Northern Myotis	Endangered ¹	√	√	√	√	√
Wolverine	Special Concern ¹	√	√	√	√	√
Wood Bison	Special Concern ¹ Endangered ² Threatened ³	√	-	-	-	-
Woodland Caribou	Threatened ^{1,2,3}	√	-	-	√	-
Birds						
Bank Swallow	Threatened ¹	√	√	√	√	√
Barn Swallow	Threatened ¹	√	√	√	√	√
Barred Owl	Special Concern ²	√	√	√	√	√
Black-throated Green Warbler	Special Concern ²	√	√	√	√	√
Canada Warbler	Threatened ^{1,3}	√	√	√	√	√
Common Nighthawk	Threatened ^{1,3}	√	√	√	√	√
Horned Grebe	Special Concern ¹	√	√	√	√	√
Olive-sided Flycatcher	Threatened ^{1,3}	√	√	√	√	√
Rusty Blackbird	Special Concern ^{1,3}	√	√	√	√	√

Table 5-2: Potential Wildlife Species with Conservation Status in the Vicinity of the Proposed Pipeline Loops (cont'd)

Common Name	Status Designation	NWML Loop – Boundary Lake Section	NWML Loop – Bear Canyon Section	GPML Loop No. 2 – McLeod River Section	Liege Lateral Loop No. 2 – Pelican Lake Section	Kettle River Lateral Loop – Christina River Section
Birds						
Short-eared Owl	Special Concern ^{1,3}	√	√	√	√	√
Trumpeter Swan	Special Concern ²	√	√	√	-	-
White-winged Scoter	Special Concern ²	√	√	√	√	√
Yellow Rail	Special Concern ²	√	√	√	√	√
Amphibians						
Western Toad	Special Concern ^{1,3}	√	√	√	√	√
Note: 1. Species designated by COSEWIC. ¹³⁸ 2. Species listed under the Alberta <i>Wildlife Act</i> . ¹³⁹ 3. - Species listed on Schedule 1 of SARA. ¹⁴⁰ - Species that are not applicable (e.g., species that do not have the potential to occur in the vicinity of the Project component)						

Table 5-3: Potential Wildlife Species with Conservation Status in the Vicinity of the Proposed Compressor Stations

Common Name	Status Designation	Alces River Compressor Station	Hidden Lake Compressor Station	Otter Lake Compressor Station	Woodenhouse Compressor Station
Mammals					
Grizzly Bear	Special Concern ¹ Threatened ²	√	√	-	-
Little Brown Myotis	Endangered ¹	√	√	√	√
Northern Myotis	Endangered ¹	√	√	√	√
Wolverine	Special Concern ¹	√	√	√	√

¹³⁸ COSEWIC 2014c

¹³⁹ AESRD 2014e

¹⁴⁰ Environment Canada 2014

Table 5-3: Potential Wildlife Species with Conservation Status in the Vicinity of the Proposed Compressor Stations (cont'd)

Common Name	Status Designation	Alces River Compressor Station	Hidden Lake Compressor Station	Otter Lake Compressor Station	Woodenhouse Compressor Station
Mammals					
Wood Bison	Special Concern ¹ Endangered ² Threatened ³	-	√	-	-
Woodland Caribou	Threatened ^{1,2,3}	-	√	-	-
Birds					
Barn Swallow	Threatened ¹	√	√	√	√
Barred Owl	Special Concern ²	√	√	√	√
Black-throated Green Warbler	Special Concern ²	√	√	√	√
Canada Warbler	Threatened ^{1,3}	√	√	√	√
Common Nighthawk	Threatened ^{1,3}	√	√	√	√
Horned Grebe	Special Concern ¹	-	-	-	√
Olive-sided Flycatcher	Threatened ^{1,3}	√	√	√	√
Rusty Blackbird	Special Concern ^{1,3}	√	√	√	√
Short-eared Owl	Special Concern ^{1,3}	√	√	√	√
Trumpeter Swan	Special Concern ²	-	√	-	√
White-winged Scoter	Special Concern ²	-	√	-	√
Amphibians					
Western Toad	Special Concern ^{1,3}	√	√	√	√
Note: 1. Species designated by COSEWIC. ¹⁴¹ 2. Species listed under the Alberta Wildlife Act. ¹⁴² 3. - Species listed on Schedule 1 of SARA. ¹⁴³ - Species that are not applicable (e.g., species that do not have the potential to occur in the vicinity of the Project component)					

¹⁴¹ COSEWIC 2014c

¹⁴² AESRD 2014e

¹⁴³ Environment Canada 2014

5.7 SOCIO-ECONOMIC ENVIRONMENT

The socio-economic topics that will be assessed as part of the ESA will include:

- heritage resources
- traditional land and resource use
- human occupancy and resource use
- social and cultural well-being
- human health
- infrastructure and services
- navigation and navigation safety
- employment and economy

The following sections present the preliminary socio-economic interactions and effects identified for each topic. The socio-economic setting and methods are also presented.

5.7.1 Heritage Resources

Historical resources in Alberta are protected under the *Historical Resources Act* administered by Alberta Culture and Tourism (ACT). In compliance with the *Historical Resources Act*, NGTL will conduct the required Historical Resources Impact Assessment (HRIA) for the NWML Loop – Boundary Lake Section, NWML Loop – Bear Canyon Section, Liege Lateral Loop No. 2 – Pelican Lake Section, Kettle River Lateral Loop – Christina River Section and all four proposed compressor stations under an Archaeological Research Permit issued by ACT.

The objectives of the archaeological resource studies are as follows:

- Identify and evaluate archaeological, historic and paleontological resources in the regional study area.
- Identify and assess all effects on archaeological, historic and paleontological resources that might result from the Project.
- Recommend viable alternatives for managing unavoidable adverse effects resulting from the Project. Information gathered during the HRIA is to assist the proponent in designing, planning and implementing a suitable approach to the Project as it concerns archaeological resources.

The Project will be initiated with a site file search of the Archaeological Survey of the Historic Places Stewardship Section of the Historic Resource Management Branch of ACT. Archaeological Site Inventory Data forms obtained from the file search will be consulted with regard to a site's proximity to the present developments, site type, artifacts collected and observed, previous disturbance and the site recommendations of the Permit Holder.

Where necessary, previous permit reports pertaining to the proposed development will be consulted. Following this, the development and any sites identified during the file search will be mapped together on a 1:50,000 NTS map to assess the proposed Project's relation to those sites, identify areas of high archaeological potential and aid in the development of the field reconnaissance portion of the HRIA.

The field portion will consist of a ground reconnaissance and visual inspection of the Project footprint. Shovel tests (approximately 40 cm x 40 cm) will be excavated in areas of high archaeological potential (e.g., areas with elevated terrain, near water sources or where surficial features or artifacts are identified). Shovel testing will focus on predefined target areas, as identified by ACT as part of the Schedule A, while also examining any and all other areas of archaeological potential identified during the ground reconnaissance and visual inspection of the Project footprint. Photographs will be taken of the general and specific terrain in the Project area, as well as any past disturbances.

Where applicable, newly identified sites will be mapped, photographed and the sites' relationship to the Project footprint will be determined. Based on the results of the initial testing stage, recommendations regarding the mitigation options available will be made. The results of the HRIA, including recommendations for mitigation on all identified sites, will be submitted in a final report to ACT.

GPML Loop No. 2 – McLeod River Section

Based on the results of a previous assessment, Alberta Culture and Community Spirit (now ACT), issued unconditional *Historical Resources Act* clearance for the GPML Loop No. 2 – McLeod River Section on December 2, 2011. It was indicated that pursuant to Section 31 of the Act, any chance finds made during construction should be reported.

Since clearance was issued, a slight revision to the GPML Loop No. 2 – McLeod River Section footprint has occurred. This revision has been screened for potential historic resource concerns and none were identified. A second clearance application will be prepared for the revision and submitted to ACT to update the GPML Loop No. 2 – McLeod River Section footprint for their files, however, no additional work is recommended.

5.7.2 Traditional Land and Resource Use

NGTL has initiated an engagement process with potentially affected Aboriginal communities. Based on the outcome of this initial engagement process, information on traditional land and resource use will be gathered through Traditional Land Use (TLU) studies and Aboriginal community participation on the environmental field studies to supplement information available to NGTL on traditional land and resource

use in the Project area. These studies will focus on the current use of land and resources for traditional purposes, as identified by the Aboriginal communities. The results of engagement with Aboriginal communities as well as Project-specific studies may be used to contribute to identifying potential adverse effects of the Project and assist with identifying mitigation opportunities.

5.7.3 Human Occupancy and Resource Use

The human occupancy and resource use component of the ESA examines human uses of land and natural resources. It considers a wide range of topics including: municipal and regional land use and development plans; residential use; managed forest areas; agricultural use; commercial and industrial use; energy resource activities; minerals and aggregates; hunting, trapping and fishing; guide outfitting; outdoor recreation use; parks and protected areas; and water supply and use. Direct disturbance or enhancement of human land and resource use areas is examined, as well as access to land use areas. Human occupancy and resource use also considers aesthetic attributes, such as sensory disturbance and visual effects, as they pertain to land and resource users. The Project is located on private land and Crown land in the Green and White Areas of northern Alberta.

Effects on human occupancy and resource use will be assessed as part of the ESA, using a combination of baseline data collection and interviews with selected local and regional representatives, and Aboriginal communities.

For the regions crossed, and municipalities in the vicinity of the Project, see Table 5-4 and Table 5-5. For Aboriginal communities and organizations in the vicinity of the Project, see Table 5-6.

Table 5-4: Regions and Municipalities – Northwest Alberta

Regions and Municipalities	Approximate Distance to Project Component (km)					
	NWML Loop - Boundary Lake Section	NWML Loop - Bear Canyon Section	GPML Loop No. 2 – McLeod River Section	Alces River Compressor Station	Hidden Lake Compressor Station	Otter Lake Compressor Station
Region						
Clear Hills County	Located in this region	--	--	Located in this region	Located in this region	--
Saddle Hills County	--	Located in this region	Located in this region	--	--	--
Northern Sunrise County	--	--	--	--	--	Located in this region
Yellowhead County			Located in this region			

Table 5-4: Regions and Municipalities – Northwest Alberta (cont'd)

Regions and Municipalities	Approximate Distance to Project Component (km)					
	NWML Loop - Boundary Lake Section	NWML Loop - Bear Canyon Section	GPML Loop No. 2 – McLeod River Section	Alces River Compressor Station	Hidden Lake Compressor Station	Otter Lake Compressor Station
Municipality						
British Columbia						
City of Fort St. John	54	78	369	54	140	270
District of Taylor	50	69	358	50	147	267
City of Dawson Creek	69	42	304	69	181	256
Village of Pouce Coupe	74	42	399	74	185	256
Alberta						
Village of Hythe	118	55	242	118	227	254
Town of Beaverlodge	132	66	227	132	241	257
Town of Wembley	143	73	210	143	249	250
City of Grande Prairie	147	75	193	147	250	233
Town of Sexsmith	133	61	211	133	233	218
Town of Spirit River	94	32	254	94	185	186
Village of Rycroft	102	41	249	102	190	182
Town of Fairview	101	66	270	101	167	142
Town of Manning	137	161	353	137	138	65
Town of Grimshaw	145	117	272	145	185	99
Town of Peace River	164	135	272	164	196	81
Town of Edson	379	309	3	379	467	365
Town of Hinton	361	291	55	361	460	390

Table 5-5: Regions and Municipalities – Northeast Alberta

Regions and Municipalities	Approximate Distance to Project Component (km)		
	Liege Lateral Loop No. 2 – Pelican Section	Kettle River Lateral Loop – Christina River Section	Woodenhouse Compressor Station
Region			
Municipal District of Opportunity No. 17	Located in this region	--	Located in this region
Regional Municipality of Wood Buffalo	Located in this region	Located in this region	--
Municipality			
Urban Service Area of Fort McMurray	89	81	164

Table 5-6: Aboriginal Organizations and Communities

Aboriginal Community/Organization	Nearest Project Component	Community Proximity to Nearest Project Component (km)
Alexander First Nation	GPML Loop No. 2 – McLeod River Section	65
Alexis Nakota Sioux Nation	GPML Loop No. 2 – McLeod River Section	131
Athabasca Chipewyan First Nation	Liege Lateral Loop No. 2 – Pelican Lake Section	182
Beaver First Nation	Otter Lake Compressor Station	173
Beaver Lake Cree Nation	Kettle River Lateral Loop – Christina River Section	142
Bigstone Cree Nation	Woodenhouse Compressor Station	36
Chipewyan Prairie Dene First Nation	Kettle River Lateral Loop – Christina River Section	3
Christina River Dene First Nation	Kettle River Lateral Loop – Christina River Section	3
Dene Tha' First Nation	NWML Loop – Boundary Lake Section	55
Doig River First Nation	NWML Loop – Boundary Lake Section	34
Duncan's First Nation	NWML Loop – Bear Canyon Section	97
Enoch Cree Nation	GPML Loop No. 2 – McLeod River Section	184
Fort McMurray #468 First Nation	Kettle River Lateral Loop – Christina River Section	51
Gift Lake Métis Settlement	Otter Lake Compressor Station	95
Heart Lake First Nation	Kettle River Lateral Loop – Christina River Section	97
Horse Lake First Nation	NWML Loop – Bear Canyon Section	54

Table 5-6: Aboriginal Organizations and Communities (cont'd)

Aboriginal Community/Organization	Nearest Project Component	Community Proximity to Nearest Project Component (km)
Loon River First Nation	Otter Lake Compressor Station	69
Lubicon Lake Band	Otter Lake Compressor Station	34
Métis Nation Alberta	All	--
Métis Nation Alberta Region 1	Liege Lateral Loop No. 2 – Pelican Lake Section	Pipeline located in this region
Métis Nation Alberta Region 4	Woodenhouse Compressor Station	Compressor station located in this region
Métis Nation Alberta Region 5	GPML Loop No. 2 – McLeod River Section	Pipeline located in this region
Métis Nation Alberta Region 6	NWML Loop – Boundary Lake Section	Pipeline located in this region
Mikisew Cree First Nation	Liege Lateral Loop No. 2 – Pelican Lake Section	229
Nakcowinewak Nation	GPML Loop No. 2 – McLeod River Section	66
Paddle Prairie Métis Settlement	Otter Lake Compressor Station	100
Paul First Nation	GPML Loop No. 2 – McLeod River Section	136
Peavine Métis Settlement	Otter Lake Compressor Station	100
Peerless Trout First Nation	Woodenhouse Compressor Station	33
Saddle Lake Cree Nation	Kettle River Lateral Loop – Christina River Section	177
Sturgeon Lake Cree Nation	NWML Loop – Bear Canyon Section	138
Sucker Creek First Nation	Woodenhouse Compressor Station	175
Whitefish Lake (Goodfish) First Nation #128	Kettle River Lateral Loop – Christina River Section	177
Woodland Cree First Nation	Otter Lake Compressor Station	19

5.7.4 Social and Cultural Well-Being

The Project may have an effect on the social and cultural well-being of communities and community members in the Project area. Potential effects identified through preliminary assessment include interaction between a temporary workforce and community members, and implications relating to the possible development of temporary construction camps.

Effects on social and cultural well-being will be assessed as part of the ESA, using a combination of baseline data collection and interviews with local and Aboriginal communities in the Project area.

5.7.5 Human Health

Effects on human health as a result of the Project may relate to changes in air, water and noise emissions and other environmental alterations. Potential effects on human health will be assessed as part of the ESA taking into account baseline conditions and issues identified through engagement with municipalities, local and Aboriginal communities, including issues identified in the TEK and TLU studies.

5.7.6 Infrastructure and Services

Project-related activities may have the potential to increase the demand for local and regional infrastructure. The potential effects of an increased demand for infrastructure and services will be assessed as part of the ESA. This assessment will be based on an evaluation of existing infrastructure and services, engagement with local and regional representatives and the professional judgement and expertise of the assessment team.

Construction will use existing infrastructure and services throughout the Project area, to the extent feasible. The looping segments of the Project will parallel existing linear disturbances for most of the loops.

5.7.7 Navigation and Navigation Safety

Navigation and navigation safety examines the use of watercourses and wetlands for navigation purposes, and the potential for Project activities to impede safe and reliable use of such watercourses/wetlands. Effects on navigation and navigation safety will be assessed through baseline data collection and interviews with local and Aboriginal communities.

5.7.8 Employment and Economy

Potential effects on employment and economy as a result of the Project will be identified as part of the ESA. These effects may include opportunities for local and regional employment, procurement opportunities and increased government revenue from taxation.

The quantitative economic effects resulting from the Project (e.g., Gross Domestic Product, employment, labour income and fiscal effects) will be estimated using the Statistics Canada interprovincial input-output model.¹⁴⁴

¹⁴⁴ Statistics Canada 2014

5.7.9 Socio-Economic Assessment Methods

Socio-economic effects will be assessed as part of the ESA, using a combination of baseline data collection and technical discussions with Aboriginal communities and local stakeholders (e.g., municipal/provincial agencies, and local land users).

Baseline data collection through desktop research will provide an information base about the Project area and socio-economic conditions. Sources of baseline data include municipal websites, Statistics Canada census and National Household Survey results, an AESRD Geographic Land Information Management Planning System (GLIMPS) search, a review of previous ESAs, and other publicly available reference material. These data will be used, in part, to formulate questions for the technical discussions (via telephone calls, emails and face-to-face meetings). The goals of these discussions are to:

- provide insight into local issues and concerns relating to the Project
- provide the necessary information for recommendations for appropriate mitigation and enhancement measures that address community needs and are within the scope of potential Project effects
- confirm information collected through baseline data collection
- fill information gaps

The quantitative economic effects resulting from the Project (e.g., Gross Domestic Product, employment, labour income and fiscal effects) will be estimated using the Statistics Canada interprovincial input-output model.¹⁴⁵

5.7.10 Socio-Economic Assessment Methods with Aboriginal Communities

The aim of collecting Aboriginal socio-economic data is to bridge information provided by TLU studies to better understand Aboriginal interests and perceptions about potential Project effects on their quality of life.

Aboriginal socio-economic effects will be assessed as part of the ESA. Through the Aboriginal Field Engagement Program, the team will collect socio-economic data through community meetings and interviews.

Reflecting Section 5.7.9 Socio-Economic Assessment Methods, baseline data collection through desktop research will provide an information base about the Project area and socio-economic conditions. Sources of baseline data include Aboriginal community websites, Aboriginal Affairs and Northern Development Community Profiles, Statistics Canada census and National Household Survey results, a review of publicly available ESAs, and other publicly available reference

¹⁴⁵ Statistics Canada 2014

material. This data will be used, in part, to formulate questions for the technical discussions (via telephone calls, emails and face-to-face meetings). The goal of these discussions is the same as the goal in Section 5.7.9.

6.0 STAKEHOLDER ENGAGEMENT

This section describes TransCanada's approach to stakeholder engagement, which ensures that stakeholders have an opportunity to review and provide input to the proposed Project. It also provides the principles and goals that TransCanada used in designing its stakeholder engagement program and describes how that program being implemented for the Project as it evolves.

For a description of the Aboriginal engagement program for the Project, see Section 7.0: Aboriginal Engagement.

6.1 STAKEHOLDER ENGAGEMENT PROGRAM

6.1.1 Program Overview

The stakeholder engagement program for the Project has been designed, and is being conducted, in accordance with TransCanada's commitment to being a good neighbour by building and maintaining positive relationships with the people who reside near its operations.

Preliminary engagement for the Project started in Q2 2014. Engagement activities will continue to evolve for the duration of the Project.

The program is intended to enable the development and maintenance of positive relationships by:

- providing clear, relevant and timely information about TransCanada, NGTL and the Project
- identifying concerns of community leaders and other interested stakeholders
- providing an opportunity for stakeholders to provide feedback on the Project
- answering stakeholder questions about TransCanada, NGTL and the Project
- fostering relationships between TransCanada, NGTL and communities along the proposed route
- ensuring NEB engagement process requirements are met or exceeded

Engagement activities and communication tools might include:

- Project email box (NGTL_2017@transcanada.com)
- Project webpage (www.NGTLExpansion.com)
- Project toll-free telephone number (1-855-458-6713)
- project-specific fact sheets and letters (see Appendix B)

- TransCanada program materials (community investment, pipeline integrity, Stakeholder Engagement Commitment Statement, stakeholder and Aboriginal relations brochures)
- NEB brochure Information for Proposed Pipeline or Power Line Projects that Involve a Hearing
- personal contact with stakeholders, including face-to-face meetings
- newspaper and radio advertisements
- open house events
- participation at community events/trade shows
- presentations

6.1.2 Community Engagement

The engagement program for the Project will be accomplished in three phases:

- preliminary stakeholder identification and material development
- stakeholder notification and engagement
- transition to operations

Preliminary Stakeholder Identification and Material Development

Using a combination of desktop research and existing contacts, NGTL has identified a preliminary list of potential stakeholders in the Project area. Additional stakeholder identification is accomplished through ongoing consultation with local government members, government agencies and community members, by pulling land titles and land use rights and providing stakeholders with the opportunity to self-identify through public engagement.

Stakeholder Notification and Engagement

Stakeholder notification began in Q3 2014. Early stakeholder notification involved providing project information such as proposed pipeline routing information, facilities, project timelines and information on other key project-related activities. In addition, NGTL has provided information regarding the NEB regulatory review process and the means by which the public can participate in the development of the Project and in the regulatory process.

In October of 2014, the Project scope grew to include the GPML Loop No. 2 – McLeod River Section. NGTL sent out a project update to all identified stakeholders, including the newly identified stakeholders. Public notices were also advertised in local newspapers in December 2014 to advise the public of the additional scope of work.

As the Project evolves, stakeholders will be provided with a variety of means to receive and obtain additional information about the Project, and to provide feedback, including updated fact sheets, opportunities to host open house events and presentations to local communities.

Throughout the stakeholder engagement process, TransCanada works with stakeholders to resolve or mitigate any concerns or issues.

Transition to Operations

Stakeholder engagement activities for the Project will be transitioned to the Public Awareness program for operations (see Section 3.3.3).

To help ensure a seamless transition to the PA program, the process begins during construction of the Project. The PA program for the Project is expected to be implemented by TransCanada's head office in Calgary, AB.

6.1.3 Stakeholders

Community and Government Stakeholders

NGTL is engaging with a broad range of community and government stakeholders on the Project, including:

- community members
- municipal leaders and representatives (e.g., municipal districts, counties, rural municipalities, cities, towns, villages)
- provincial and federally elected officials
- government agencies and representatives
- non-government organizations

Landowners and Occupants

Landowners and occupants will be consulted through all phases of the Project. NGTL has identified potentially affected landowners and occupants in the vicinity of the proposed route in the following districts, communities and municipalities in Alberta and BC:

- Regional Municipality of Wood Buffalo
- Municipal District of Opportunity
- Saddle Hills County
- Clear Hills County
- Northern Sunrise County
- Yellowhead County

- Edson
- Dawson Creek

Land Users

To identify land users, occupants and Crown disposition holders, TransCanada uses desktop research, and land users are additionally identified through the Aboriginal and Community Consultation process. Land users were notified of the Project in person and by mail and have been invited to contact NGTL with any questions, concerns or inquiries, and will be informed of any project schedule changes.

These groups and individuals include:

- trappers
- grazing lease holders and other disposition holders

6.1.4 Preliminary Community Feedback

NGTL, through its current operations, has built productive and respectful relationships with communities and local officials representing the areas in which it does business. NGTL relies on its existing relationships with communities in areas potentially affected by the Project, and consistent communication between NGTL and stakeholders will ensure that feedback is acted on in a timely manner and that concerns will be considered in project planning.

Preliminary discussions with community stakeholders have identified the following areas of interest and potential concern about the Project:

- location of worker camp sites
- local licensing requirements for camp operations
- impacts on local infrastructure
- impacts on community services
- visual scarring on the land
- employment and training
- maximizing economic benefits to the communities
- lifespan of pipeline infrastructure
- protection of surface water

7.0 ABORIGINAL ENGAGEMENT PROGRAM

7.1 PROGRAM OVERVIEW

The goals of the Aboriginal engagement program for the Project are to:

- build and maintain positive long-term relationships with Aboriginal communities and organizations potentially affected by the Project
- develop timely and accurate information to allow for informed, effective and meaningful engagement with communities
- identify acceptable community engagement protocols and practices
- ensure that Aboriginal organization input and concerns are gathered, understood and integrated into Project design and execution, including the environmental and socio-economic assessment (ESA), as appropriate
- support the participation (e.g., capacity funding and information sharing) of Aboriginal communities and organizations in regulatory processes
- integrate traditional knowledge and Aboriginal input into the Project design, where feasible
- ensure that Aboriginal communities and organizations are aware of how their participation has influenced the ESA and Project planning
- ensure that issues and concerns with respect to potential effects related to Aboriginal communities and organizations are identified and addressed
- identify potential for education, training, employment and contracting opportunities
- facilitate ongoing communication that continues through Project construction and operations

7.1.1 Identified Aboriginal Communities and Organizations

To identify a preliminary list of Aboriginal communities and organizations, NGTL conducted desktop research to assess the proximity of the Project to:

- reserves under the *Indian Act*
- Métis settlements
- asserted traditional territories
- known areas of traditional use

An initial list of Aboriginal groups potentially affected by the Project is developed through a combination of desktop research, NGTL's own operating experience, and NGTL's established network of contacts with Aboriginal communities and organizations (see Table 7-1). These Aboriginal communities and organizations have

been advised of the Project and will be provided with copies of this Project Description.

Table 7-1: Preliminary List of Aboriginal Communities and Organizations

Alexander First Nation	Métis Nation Alberta (MNA)
Alexis Nakota Sioux Nation	Métis Settlement General Council
Athabasca Chipewyan First Nation	Mikisew Cree First Nation
Beaver First Nation	MNA Region 1
Beaver Lake Cree Nation	MNA Region 4
Bigstone Cree First Nation	MNA Region 5
Chipewyan Prairie Dene First Nation	MNA Region 6
Christina River Dene Nation Council	Nakcowinewak Nation
Dene Tha' First Nation	Paddle Prairie Métis Settlement
Doig River First Nation	Paul First Nation
Duncan's First Nation	Peavine Métis Settlement
Enoch Cree Nation	Peerless Trout First Nation
Fort McMurray 468 First Nation	Saddle Lake Cree Nation
Gift Lake Métis Settlement	Sturgeon Lake Cree Nation
Heart Lake First Nation	Sucker Creek First Nation
Horse Lake First Nation	Whitefish Lake (Goodfish) First Nation 128
Loon River First Nation	Woodland Cree First Nation
Lubicon Lake Band	

TransCanada, on behalf of itself and its subsidiaries, collaborates with the Métis Nation of Alberta (MNA) and the MNA Regions to identify the potentially affected Métis communities in proximity to proposed TransCanada projects. Following this process, NGTL has and will continue to share Project information and engage with the identified Métis communities, as appropriate.

For the location of Aboriginal communities and organizations in proximity to the Project components, see Figure 7-1 and Figure 7-2.

7.1.2 Preliminary Aboriginal Feedback

NGTL has provided Project information and initiated preliminary discussions with Aboriginal communities and organizations. These discussions have identified the following areas of interest and potential concerns related to the Project:

- consultation fatigue
- lack of capacity to engage on the Project
- increased access and access restrictions
- cumulative effects
- environmental concerns, including effects of facility noise on wildlife and effects on beaver habitat

- training, employment and contracting
- participation in field studies

These potential interests and concerns will be considered in the Project ESA and will form the basis for future engagement between NGTL and each interested Aboriginal organization.





8.0 REGULATORY AUTHORIZATIONS

8.1 FEDERAL AUTHORIZATIONS

In addition to approvals under the NEB Act, various other federal approvals and authorizations might be required for the Project.

For a preliminary list of federal approvals and authorizations, see Table 8-1. A final list will be developed in consultation with federal authorities, as changes to the federal permitting process are implemented, and as Project design and construction planning progresses.

Table 8-1: Preliminary List of Federal Regulatory Approvals and Authorizations

Department	Authority	Approval
Fisheries and Oceans Canada ¹ (DFO)	Section 35(2) of the <i>Fisheries Act</i>	Under the Memorandum of Understanding (MOU) between the NEB and DFO, the NEB will assess potential effects of the Project on fish or fish habitat and aquatic species at risk. If the NEB determines that a project could result in serious harm to fish or fish habitat, or adverse effects on species at risk, the NEB will notify DFO that a <i>Fisheries Act</i> and/or SARA permit might be required.
National Energy Board ¹	Section 109 of NEB Act	Approval to install a pipeline along, or under, navigable water.
	Section 6(1) of the <i>Navigation Protection Act</i>	If required, approval to install a permanent access road crossing structure on, or across, navigable water.
Environment Canada	Section 73 Permit or Agreement under the <i>Species at Risk Act</i>	Might be required for activities that incidentally affect a listed wildlife species, any part of its critical habitat or the residences of its individuals.
Note: 1. Responsibility for Transport Canada permitting was transitioned to the NEB under an MOU, effective July 2013.		

8.2 PROVINCIAL AUTHORIZATIONS

Various authorizations under provincial legislation might be required to undertake activities ancillary to, but necessary for, Project construction and operations.

For a preliminary list of Alberta approvals and authorizations, see Table 8-2.

Table 8-2: Preliminary List of Alberta Regulatory Approvals and Authorizations

Department	Authority	Approval
Alberta Environment and Sustainable Resource Development	<i>Public Lands Act</i>	Surface dispositions for pipeline ROW and facility sites (i.e., PLA and Pipeline Installation Lease [PIL]), and temporary access on Crown land.
	Wildlife Land Use Guidelines	Key Wildlife and Biodiversity Zone Plan and Caribou Mitigation Plan.
	<i>Forest and Prairie Protection Act</i>	License approval to burn cleared debris.
	<i>Water Act</i>	Watercourse Crossings Notification form for pipeline watercourse crossing and any non-exempt temporary vehicle/equipment crossing.
	<i>Water Act</i> Code of Practice for Pipeline Hydrostatic Testing <i>Water Act</i> Code of Practice for the Release of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Gas Pipelines	Codes of Practice Notification form for temporary diversion of water and release of hydrostatic test water.
Alberta Culture and Tourism	<i>Historical Resources Act</i>	Clearance for pipeline ROW (via Statement of Justification and HRIA).

8.3 REGIONAL AND MUNICIPAL APPROVALS

A variety of permits and authorizations from regional, municipal and other local authorities might be required, as well as from private third-party utilities, railway and pipeline companies. These approvals will be confirmed as project planning and design progress.

Typical regional, municipal and other local government approvals include:

- electrical permits for metering and compression facilities, if required
- access road permits
- permissions to cross county and regional district roads
- water use
- health approval for industrial camps
- development and/or temporary building permits
- camps/yards

9.0 DISTRIBUTION LISTS

This section provides the initial distribution lists for this Project Description.

The distribution lists of federal and provincial government department and agency recipients, and other authorities, were developed based on publicly available information and the collective experience of NGTL and its environmental consultants.

9.1 FEDERAL AUTHORITIES

For the federal government recipients of this Project Description, see Table 9-1.

Table 9-1: Federal Government Recipients of Project Description

Department	Contact	Contact Information
Environment Canada	Environmental Assessment Officer – Program and Planning Coordination	Room 200, 4999 – 98 Avenue Edmonton, AB T6B 2X3
Fisheries and Oceans Canada	Senior Habitat Biologist – Alberta District	Whitemud Business Park 4253 – 97 Street Edmonton, AB T6E 5Y7
Aboriginal Affairs and Northern Development Canada	Regional Subject Expert for the Prairie Provinces Consultation and Accommodation Unit	10 Wellington, 5-H, 5th Floor Gatineau, QC
Natural Resources Canada	Senior Environmental Assessment Officer – Environmental Assessment Group	580 Booth Street 11 th Floor, Room C7C7-1 Ottawa, ON K1A 0E4
	Director General, Major Projects Management Office	155 Queen Street, 2 nd Floor Ottawa, ON K1A 0E4

9.2 PROVINCIAL AUTHORITIES

For the Alberta government recipients of this Project Description, see Table 9-2.

Table 9-2: Alberta Government Recipients of Project Description

Department	Contact	Contact Information
Alberta Environment and Sustainable Resource Development	Forest Officer, Lands Branch	Bag 900-04, Room 115, Provincial Building 9621 – 96 Avenue Peace River, AB T8S 1T4
	Area Wildlife Biologist, Fish and Wildlife Branch	Bag 900-04, Room 115, Provincial Building 9621 – 96 Ave Peace River, AB T8S 1T4

Table 9-2: Alberta Government Recipients of Project Description (cont'd)

Department	Contact	Contact Information
Alberta Environment and Sustainable Resource Development (cont'd)	Senior Fisheries Biologist, Fish and Wildlife Branch	Bag 900-04, Room 115, Provincial Building 9621 – 96 Avenue Peace River, AB T8S 1T4
	Surface Water Approvals Coordinator	Bag 900-04, Room 115, Provincial Building 9621 – 96 Avenue Peace River, AB T8S 1T4

9.3 OTHER AUTHORITIES

For other authorities who will receive copies of this document, see Table 9-3.

Table 9-3: Other Authorities Receiving Project Description

Authority	Contact Information
Northern Sunrise County	Peter Thomas, Chief Administrative Officer 135 Sunrise Road Bag 1300 Peace River, AB T8S 1Y9
Clear Hills County	Allen Rowe, Chief Administrative Officer Box 240 Worsley, AB T0H 3W0
Saddle Hills County	Bob Cardwell, Chief Administrative Officer Junction of Highway 49 and Highway 725 RR1 Spirit River, Alberta T0H 3G0
MD of Opportunity	Helen Alook, Chief Administrative Officer 2077 Mistassiniy Road N Box 60 Wabasca, Alberta T0G 2K0
RM of Wood Buffalo	Marcel Ulliac, Chief Administrative Officer 9909 Franklin Avenue Fort McMurray, Alberta T9H 2K4
RM of Wood Buffalo	Deanna Pennell, Administrative Assistant 9909 Franklin Avenue Fort McMurray, Alberta T9H 2K4
Yellowhead County	Jack Ramme, Chief Administrative Officer Administration Office 2716 First Ave Edson, AB T7E 1N9
Edson, AB	Greg Clarence Joy, Chief Administrative Officer Town of Edson 605 50 th Street Edson, AB T7E 1T7

9.4 ABORIGINAL COMMUNITIES AND ORGANIZATIONS

As discussed in Section 7.2.2, NGTL developed an initial list of Aboriginal communities and organizations that might potentially be affected by the Project.

The communities and organizations on the list have been notified about the Project and will be provided with copies of this Project Description (see Table 9–4).

Table 9-4: Aboriginal Community/Organization Recipients of Project Description

Aboriginal Community	Leadership Contact	Contact Information
Alexander First Nation	Ken Arcand, Executive Director	PO Box 3480 Morinville, AB T8R 1S3
Alexis Nakota Sioux Nation	Duane Kootenay, Consultation Coordinator	PO Box 337 Glenavis, AB T0E 0X0
Athabasca Chipewyan First Nation	Rose Ross, Project Manager	220A Taiganova Crescent Fort McMurray, AB T9K 0T4
Beaver Lake Cree Nation	Chief & Council	PO Box 960 Lac La Biche, AB T0A 2C0
Beaver First Nation	Chief Trevor Mercredi	PO Box 2700 High Level, AB T0H 1Z0
Bigstone Cree First Nation	Melvin Beaver, Director Government and Industry Relations	PO Box 1710 Wabasca, AB T0G 2K0
Chipewyan Prairie Dene First Nation	Shaun Janvier, Director, Industry Relations Corporation	PO Box 1020 Suite #204, 10115-101 Ave Lac La Biche, AB T0A 2C0
Christina River Dene Nation Council	Almer Herman, Headsman	PO Box 49 Chard/Janvier South, AB T0P 1G0
Dene Tha' First Nation	Chief Joe Pastion	PO Box 120 Chateh, AB T0H 0S0
Doig River First Nation	Chief Norman Davis	PO Box 56 Rose Prairie, BC V0C 2H0
Duncan's First Nation	Chief Don Testawich	PO Box 148 Brownvale, AB T0H 0L0
Enoch First Nation	Leigh Ann Ward, Consultation Lead Manager	PO Box 543 Enoch, AB T7X 3Y3
Fort McMurray 468 First Nation	Velma Hogan, Government Liaison Manager	Box 6130 Fort McMurray, AB T9H 4W1
Gift Lake Métis Settlement	Dave Lamouche, Chairperson	PO Box 60 Gift Lake, AB T0G 1B0
Heart Lake First Nation	Cameron Knutson, Consultation Contact	PO Box 447 Lac La Biche AB T0A 1C0
Horse Lake First Nation	Chief Eugene Horseman	PO Box 303 Hythe, AB T0H 2C0

Table 9-4: Aboriginal Community/Organization Recipients of Project Description (cont'd)

Aboriginal Community	Leadership Contact	Contact Information
Loon River First Nation	Eva Whitehead, Manager, Consultation Unit	PO Box 189, Red Earth, AB T0G 1X0
Lubicon Lake Band	Chief Billy Joe Laboucan	PO Box 1351 Isidore, AB T0H 3B0
Métis Settlement General Council	Randy Hardy, President	100, 10335 172 Street Edmonton, AB T5S 1K9
Mikisew Cree First Nation	Melanie Dene, Consultation Coordinator	206, 9401 Franklin Ave. Fort McMurray, AB T9H 3Z7
Métis Nation of Alberta	Audrey Poitras, President	100, Delia Gray Building 11738 Kingsway Avenue Edmonton, AB T5G 0X5
MNA Region 1	Diane Scoville, President	PO Box 1350 Lac La Biche, AB T0A 2C0
MNA Region 4	Cecil Bellrose, President	11724 95th Street Edmonton, AB T5G 1L9
MNA Region 5	Bev New, President	PO Box 1787 Slave Lake, AB T0G 2A0
MNA Region 6	Sylvia Johnson, President	9621 90 th Avenue Peace River, AB T8S 1W2
Nakcowinewak Nation	Jean Whitehorse	PO Box 6116 Edson, AB T7V 1X5
Paddle Prairie Métis Settlement	Greg Calliou, Chairperson	PO Box 58 Paddle Prairie, AB T0H 2W0
Peavine Métis Settlement	Iner Gauthier, Chairperson	Bag 4 High Prairie, AB T0G 1E0
Peerless Trout First Nation	Doreen Seesequon, Consultation Coordinator	PO Box 128 Peerless Lake, AB T0G 2W0
Whitefish Lake (Goodfish) First Nation 128	Darryl Steinhauer, Consultation Coordinator	Box 271 Goodfish Lake, AB T0A 1R0
Woodland Cree First Nation	Chief Isaac Laboucan-Avion	General Delivery Cadotte Lake, AB T0H 0N0
Paul First Nation	Dennis Paul, Consultation Coordinator	PO Box 30 Duffield, AB T0E 0N0
Saddle Lake Cree Nation	Frank Cardinal, Consultation Coordinator	PO Box 696 Saddle Lake, AB T0A 3T0
Sturgeon Lake Cree Nation	Darlene Kappo, Consultation Manager	PO Box 757 Valleyview, AB T0J 3N0
Sucker Creek First Nation	- Clayton Cunningham, Director of Consultation - Chief and Council	PO Box 65 Enilda, AB T0G 0W0

10.0 REFERENCES CITED

- Alberta Conservation Information Management System. 2014a. *Tracked Elements Listed by Natural Subregions*. May 2014. Government of Alberta Tourism, Parks and Recreation. Edmonton, AB. Website:
http://tpr.alberta.ca/parks/heritageinfocentre/datarequests/docs/Tracked_Elements_by_Natural_Subregions.xls. Accessed: August 2014.
- Alberta Conservation Information Management System. 2014b. *Element Occurrences (Part 1: Non-Sensitive)*. May 2014. Government of Alberta Tourism, Parks and Recreation. Edmonton, AB. Available:
<http://tpr.alberta.ca/parks/heritageinfocentre/datarequests/default.aspx>.
Acquired: June 2014. Last Update Check: July 16, 2014.
- Alberta Environment. 2006a. *Peace River Management Area. Water Act Code of Practice Management Area Maps*. Prepared by Alberta Environment and Alberta Sustainable Resource Development, Finance and Administration Division, Resource Information Management Branch, Government of Alberta.
- Alberta Environment. 2006b. *Grand Prairie Management Area. Water Act Code of Practice Management Area Maps*. Prepared by Alberta Environment and Alberta Sustainable Resource Development, Finance and Administration Division, Resource Information Management Branch, Government of Alberta.
- Alberta Environment. 2006c. *Fort McMurray Management Area. Water Act Code of Practice Management Area Maps*. Prepared by Alberta Environment and Alberta Sustainable Resource Development, Finance and Administration Division, Resource Information Management Branch, Government of Alberta.
- Alberta Energy and Utilities Board. 2007. *Directive 038: Noise Control Directive* (February 16, 2007). Calgary, AB.
- Alberta Environment and Sustainable Resource Development. 2014a. *Alberta Water Well Information Database*. Available:
<http://groundwater.alberta.ca/WaterWells/d/>. Accessed October 22, 2014.
- Alberta Environment and Sustainable Resource Development. 2014b. *Fisheries and Wildlife Internet Mapping Tool*. Fish and Wildlife Division. Area-specific search request and website:
http://xnet.env.gov.ab.ca/imf/imf.jsp?site=fw_mis_pub.
Accessed: August 2014.

- Alberta Environment and Sustainable Resource Development. 2014c. *Species Assessed by Alberta's Endangered Species Conservation Committee: Short List*. Wildlife Management Branch. Website: <http://www.srd.alberta.ca/FishWildlife/SpeciesAtRisk/SpeciesSummaries/documents/SpeciesAssessed-EndangeredSpeciesConservationCommittee-ShortList-Nov06-2012.pdf>. Accessed: August 2014.
- Alberta Environment and Sustainable Resource Development. 2014d. *Wildlife Sensitivity Maps – Data Sets*. Available: <http://esrd.alberta.ca/forms-maps-services/maps/wildlife-sensitivity-maps/default.aspx>. Accessed August 2014.
- Alberta Environment and Sustainable Resource Development. 2014e. *Species Assessed by Alberta's Endangered Species Conservation Committee*. Updated July 4, 2014.
- Alberta Government. 2013a. *Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body*. Includes Amendments to February 2007. Edmonton, AB. 36 pp.
- Alberta Government. 2013b. *Code of Practice for Watercourse Crossings*. Includes Amendments to February 2007. Edmonton, AB. 44 pp.
- Alberta Government. 2013c. *Alberta Wetland Policy*. Edmonton, AB. 24 pp.
- Alberta Soil Information Centre. 2014. *Alberta Soil Information Viewer*. Available: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sag10372](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sag10372). Accessed August 21, 2014.
- Alberta Sustainable Resource Development. 2010. Revised 2012. *The General Status of Alberta Wild Species*. Fish and Wildlife Division. Edmonton, AB.
- Committee on the Status of Endangered Wildlife in Canada. 2014a. *Wildlife Species Search*. Database of Wildlife Species Assessed by COSEWIC. Website: http://www.cosewic.gc.ca/eng/sct1/searchform_e.cfm. Accessed: August 2014.
- Committee on the Status of Endangered Wildlife in Canada. 2014b. *The COSEWIC Candidate List*. Website: http://www.cosewic.gc.ca/eng/sct3/index_e.cfm#p3. Accessed: August 2014.
- Committee on the Status of Endangered Wildlife in Canada. 2014c. *Canadian Species at Risk*. Website: http://www.cosewic.gc.ca/eng/sct5/index_e.cfm. Accessed: August 2014.

- Environment Canada. 1991. *The Federal Policy on Wetland Conservation*. Available from Canadian Wildlife Service, Environment Canada. Ottawa, ON.
- Environment Canada. 2008. *Maps of Canadian IPY Study Area*. Available: <http://www.ec.gc.ca/api-ipy/default.asp?lang=En&n=C738CF39-0>. Accessed August 25, 2014.
- Environment Canada. 2014. *Species at Risk Public Registry*. Website: http://www.sararegistry.gc.ca/default_e.cfm. Accessed: August 2014.
- Government of Alberta. 2013. *Integrated Standards and Guidelines – Enhanced Approval Process*. December 1, 2013. 84 pp.
- Government of Canada. 1986. Canada: Wetland Regions. *Atlas of Canada, 5th Edition*. Map. Website: <http://atlas.nrcan.gc.ca/site/english/maps/water.html>. Accessed: July 2013.
- Moors, M. 2011. *Historical Resources Impact Assessment, NOVA Gas Transmissions Ltd. Grande Prairie Mainline Loop No. 2, Macleod River Section, Final Report, Permit 2011- 148*. Stantec Consulting Ltd. Report on File, Historic Resources Management Branch. Edmonton AB.
- Natural Regions Committee. 2006. *Natural Regions and Subregions of Alberta*. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852.
- Natural Resources Canada. 2009a. Permafrost. *Atlas of Canada, 6th Edition*. Website: <http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/dc7107c0-8893-11e0-aa10-6cf049291510.html>. Accessed: August 2014.
- Natural Resources Canada. 2009b. Distribution of Freshwater Wetlands. *Atlas of Canada, 6th Edition*. Her Majesty the Queen in Right of Canada.
- National Wetland Working Group. 1988. *Wetlands of Canada*. Ecological Land Classification Series, No. 24. Environment Canada and Polyscience Publications Inc. Ottawa, ON. 452 pp.
- National Wetland Working Group. 1997. *The Canadian Wetland Classification System*. B.G Warner and C.D.A. Rubec (Eds.). Wetlands Research Centre, University of Waterloo, Waterloo, ON.
- Pettapiece, W.W. 1986. *Physiographic Subdivisions of Alberta* (Map).

Statistics Canada. 2014. *Input-Output Model Simulations (Interprovincial Model), 2010*. February 10, 2014.

GIS Data and Mapping References

This subsection includes references cited in the figures included in Section 5.

AltaLIS. 2009. *Alberta Township System Version 4.1* (digital file). Calgary, AB.
Available: <http://www.altalis.com>. Acquired: October 2009.
Last Update Check: June 5, 2014.

AltaLIS. 2014. *Alberta Municipal Boundaries* (digital file). Calgary, AB.
Available: <http://www.altalis.com>. Acquired: June 2014.
Last Update Check: July 2, 2014.

ASRD. 2005. *2005 Natural Regions and Subregions* (digital file). Edmonton, AB.
Available:
<http://tpr.alberta.ca/parks/heritageinfocentre/naturalregions/default.aspx>.
Acquired: October 2010. Last Update Check: May 7, 2014.

ATPR. 2012. *Protected Areas (pashape_ocsites_10tm)* (digital file). Edmonton, AB.
Available: <http://albertaparks.ca/albertaparksca/library/downloadable-data-sets.aspx>. Acquired: February 2013. Last Update Check: May 13, 2014.

ESRI. 2005. *Canada Major Roads* (digital data). Redlands, CA. Received: via DVD with ArcGIS software, visit <http://www.esri.com/data/data-maps> for more info.
Acquired: September 2006. Last update check: N/A.

ESRI. 2005. *Canada Provincial Boundaries* (digital data). Redlands, CA. Received: via DVD with ArcGIS software, visit <http://www.esri.com/data/data-maps> for more info. Acquired: September 2006. Last update check: N/A.

Government of Canada. 2014. *Aboriginal Lands, Canada* (digital file). Edmonton, AB. Available: <http://www.geobase.ca>. Acquired: July 2014. Last Update Check: July 10, 2014.

IHS Inc. 2013. *IHS First Nations* (digital file). Calgary, AB. Received: via DVD, visit <http://www.ihs.com> for more info. Acquired: October 2013. Last Update Check: April 21, 2014.

IHS Inc. 2004. *IHS Hydro Line/Region Data* (digital file). Calgary, AB.
Received: via DVD, visit <http://www.ihs.com> for more info.
Acquired: June 2011. Last Update Check: April 21, 2014.

- IHS Inc. 2013. *IHS Miscellaneous Boundaries* (digital file). Calgary, AB. Received: via DVD, visit <http://www.ihs.com> for more info. Acquired: July 2013. Last Update Check: April 21, 2014.
- Natural Resources Canada. 2014. *Canada Lands Administrative Boundaries Level 1* (digital file). Ottawa, ON. Available: <http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/eb3757cc-d08b-5e62-9a44-3a8534ff3249.html>. Acquired: June 2014. Last Update Check: July 10, 2014.
- NOVA Gas Transmission Ltd. (NGTL). 2014. *Preliminary Liege Lateral Loop No. 2 - Pelican Lake Section* (digital file). Calgary, AB. Acquired: August 2014. Last Update Check: August 29, 2014.
- NOVA Gas Transmission Ltd. (NGTL). 2014. *Proposed Alces River Compressor Station, Otter Lake Compressor Station, Woodenhouse Compressor Station* (digital file). Calgary, AB. Acquired: August 2014. Last Update Check: August 14, 2014.
- NOVA Gas Transmission Ltd. (NGTL). 2014. *Proposed Hidden Lake Compressor Station* (digital file). Calgary, AB. Acquired: August 2014. Last Update Check: August 26, 2014.
- NOVA Gas Transmission Ltd. (NGTL). 2014. *Proposed Kettle River Loop - Christina River Section* (digital file). Calgary, AB. Acquired: August 2014. Last Update Check: August 20, 2014.
- NOVA Gas Transmission Ltd. (NGTL). 2014. *Proposed Northwest Mainline Loop – Bear Canyon Section* (digital file). Calgary, AB. Acquired: September 2014. Last Update Check: September 04, 2014.
- NOVA Gas Transmission Ltd. (NGTL). 2014. *Proposed Northwest Mainline - Boundary Lake Loop* (digital file). Calgary, AB. Acquired: August 2014. Last Update Check: August 20, 2014.
- NRCan. 2012. *CanVec - Transportation - 1020009 Railway* (digital file). Sherbrooke, QC. Available: <http://geogratis.cgdi.gc.ca/geogratis/en/download/topographic.html>. Acquired: June 2012. Last Update Check: November 2012.
- TERA Environmental Consultants. 2008. *Hillshade*. Derived from Natural Resources Canada, Earth Sciences Sector, Centre for Topographic Information. 2000–2008. Canadian Digital Elevation Data 250k (digital files). Sherbrooke, QC. Available: <http://www.geobase.ca/geobase/en/data/cded/index.html>. Acquired: 2008. Last Update Check: December 2010.

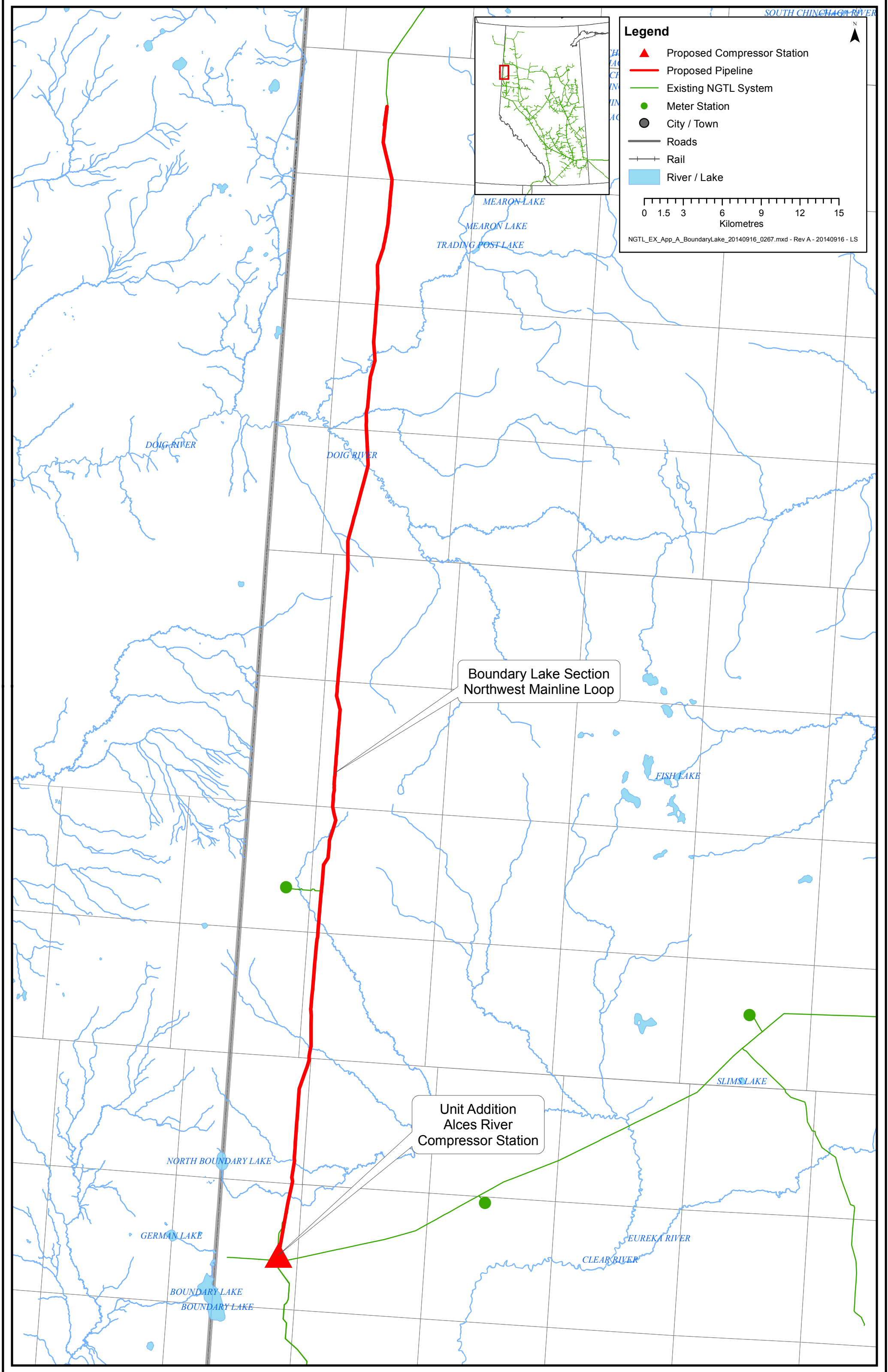
AB	Alberta
AC	alternating current
ACIMS	Alberta Conservation Information Management System
ACT	Alberta Culture and Tourism
AER	Alberta Energy Regulator
AESRD	Alberta Environment and Sustainable Resource Development
Board	National Energy Board
CAC	criteria air contaminant
CEAA	<i>Canadian Environmental Assessment Act</i>
COP	Codes of Practice
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CP	cathodic protection
CPCN	<i>Certificate of Public Convenience and Necessity</i>
CSA	Canadian Standards Association
DFO	Fisheries and Oceans Canada
EC	Environment Canada
ESA	Environmental and Socio-Economic Assessment
ESCC	Endangered Species Conservation Committee
GHG	greenhouse gas
HDD	horizontal directional drill
HRIA	historical resources impact assessment
HRV	historic resource value
ILI	in-line inspection

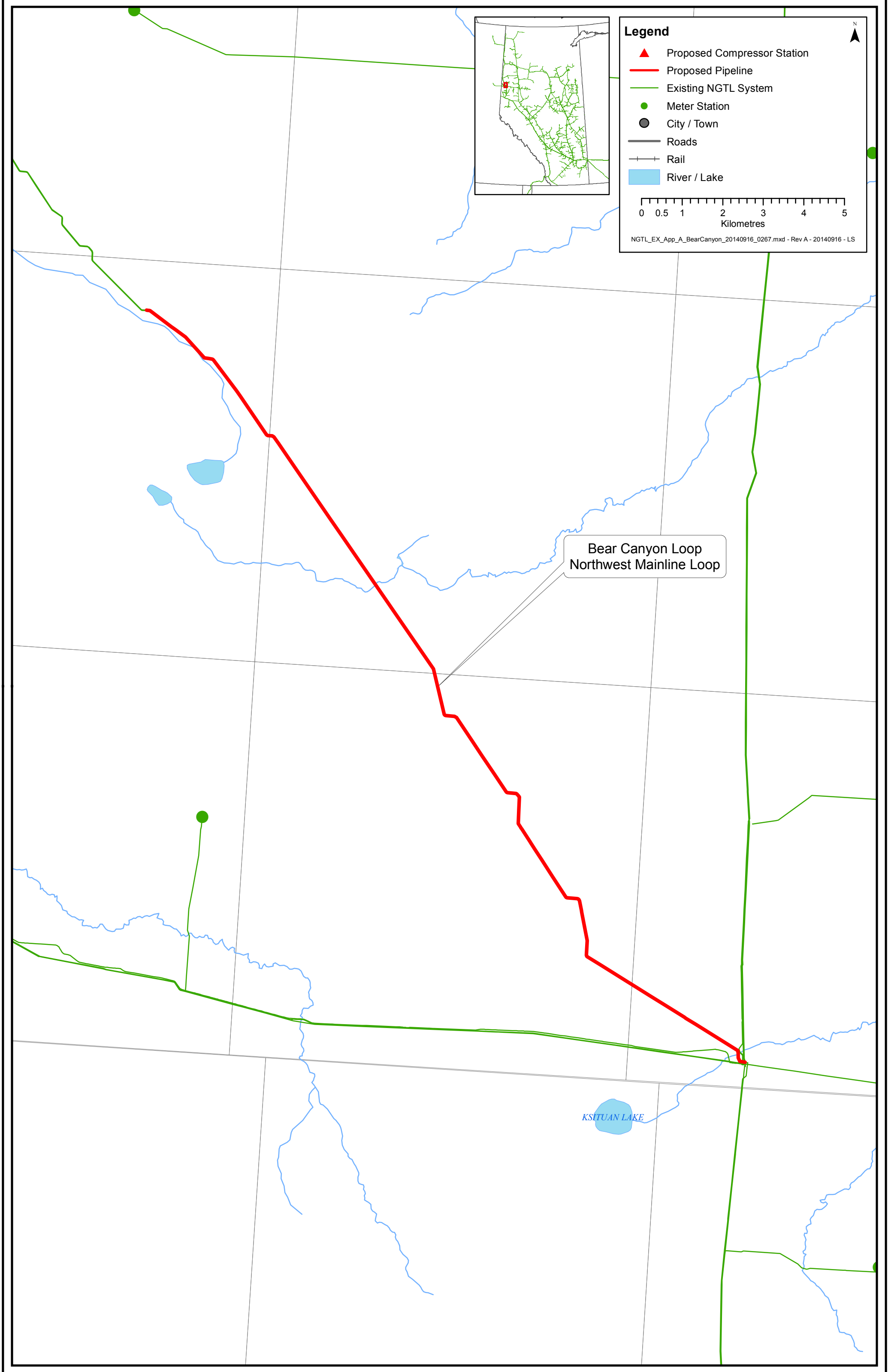
ILMB	Integrated Land Management Bureau
IMP	Integrity Management Program
km	kilometre
mm	millimetre
MW	megawatt
NEB	National Energy Board
NGTL	NOVA Gas Transmission Ltd.
NPA	<i>Navigation Protection Act</i>
NWML	Northwest Mainline
NWWG	National Wetlands Working Group
OCC	Operations Control Centre
OD	outside diameter
PA	Public Awareness
PD	Project Description
PFP	Participant Funding Program
PLA	Pipeline Agreements
Project	2017 NGTL Expansion Project
QAES	qualified aquatic environment specialist
RAP	restricted activity period
ROW	right-of-way
SARA	<i>Species at Risk Act</i>
SCADA	supervisory control and data acquisition
TEK	traditional ecological knowledge

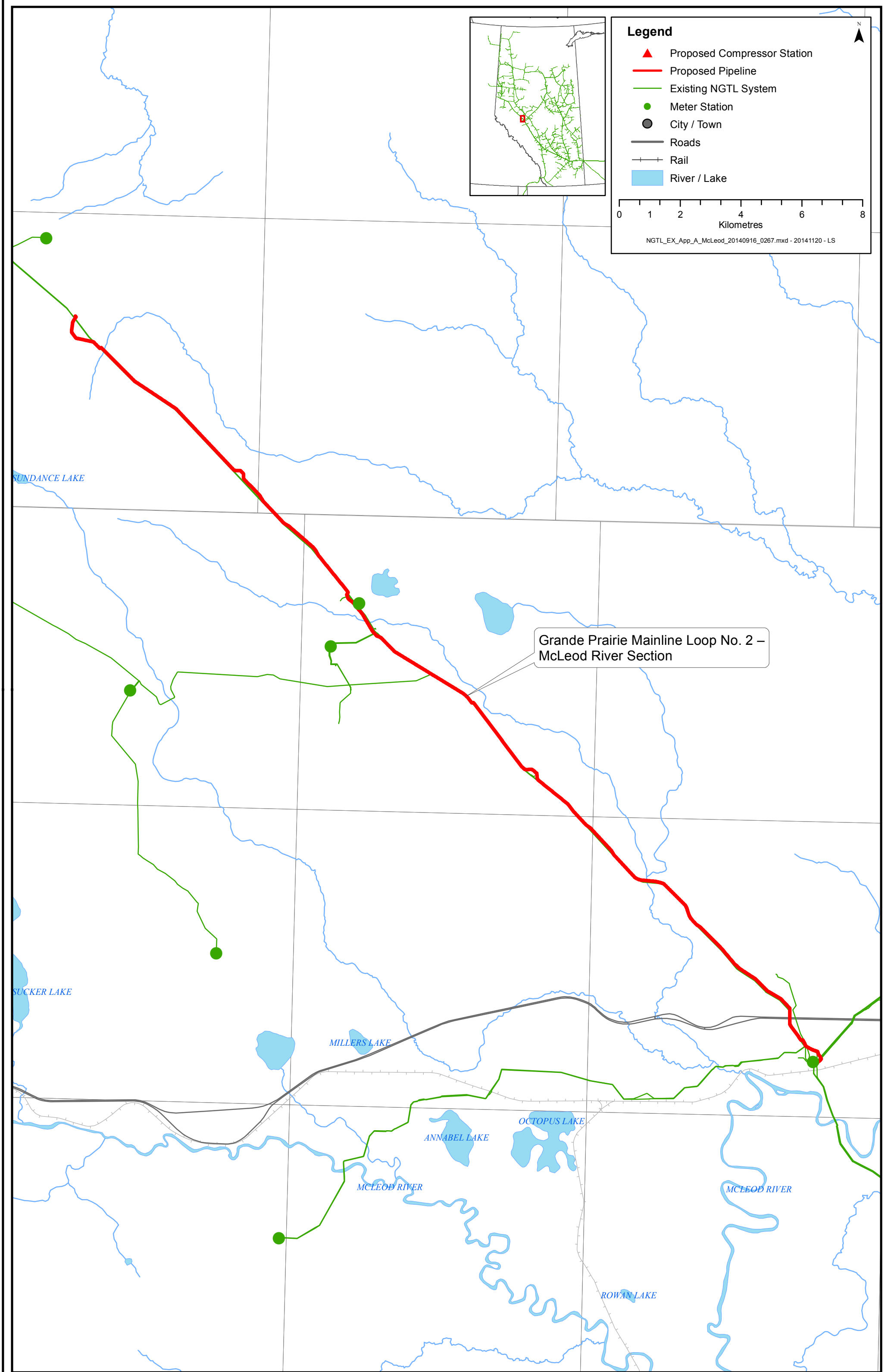
TLRU	traditional land and resource use
TPA	trapper permit area
TransCanada	TransCanada PipeLines Limited
TWS	temporary workspace
VOC	volatile organic compound
WMU	wildlife management unit

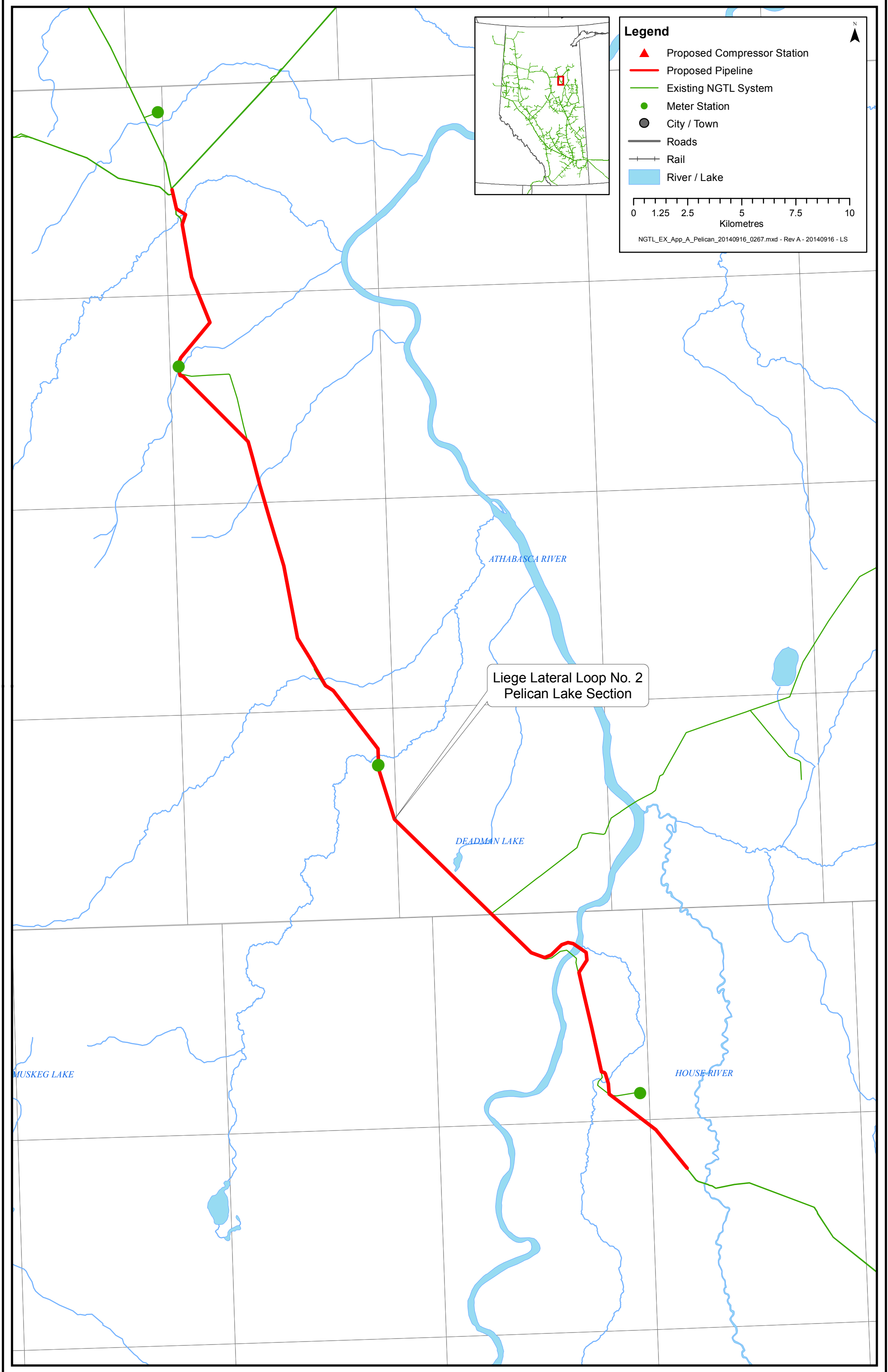
Appendix A

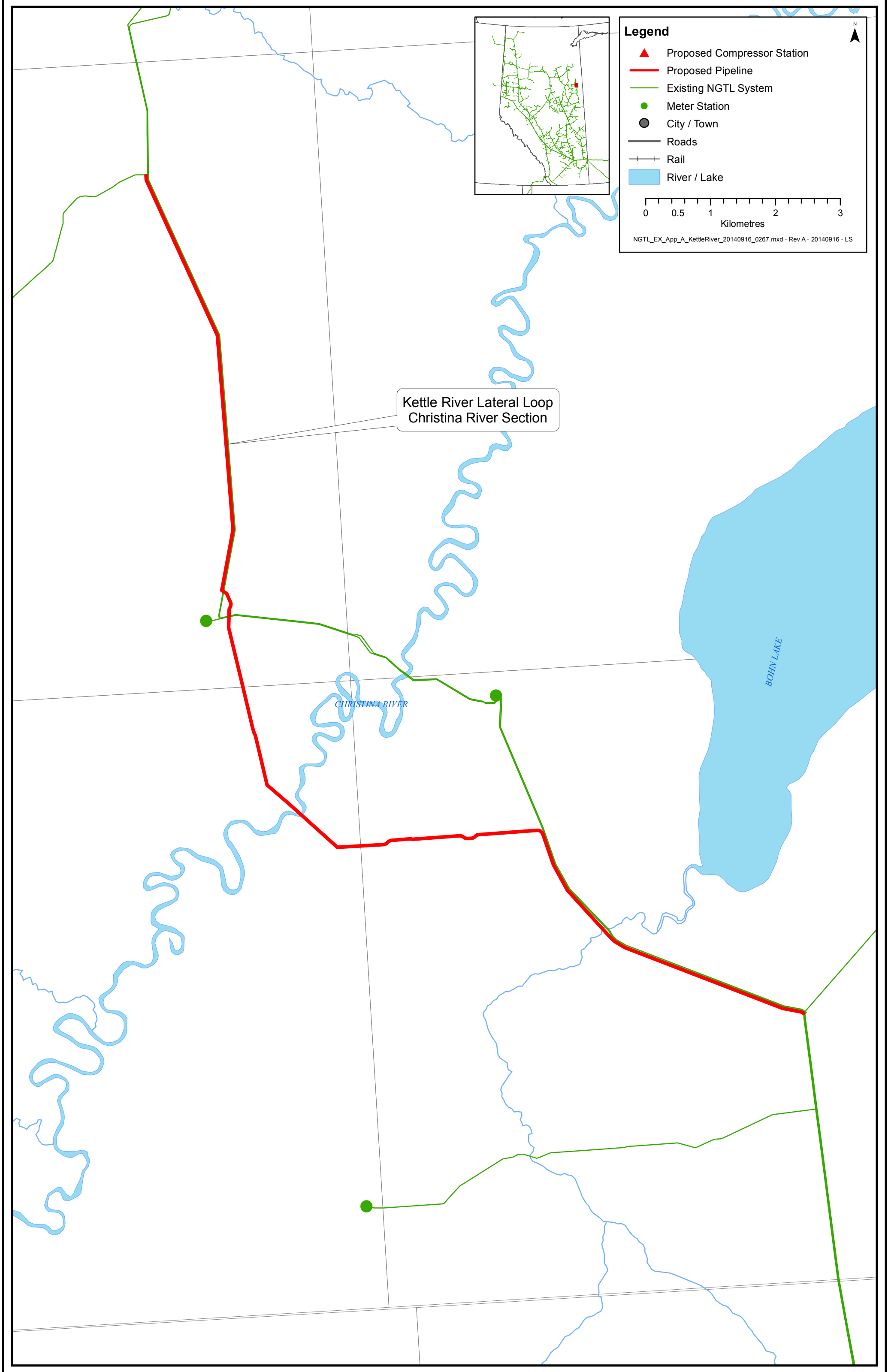
Overview Maps







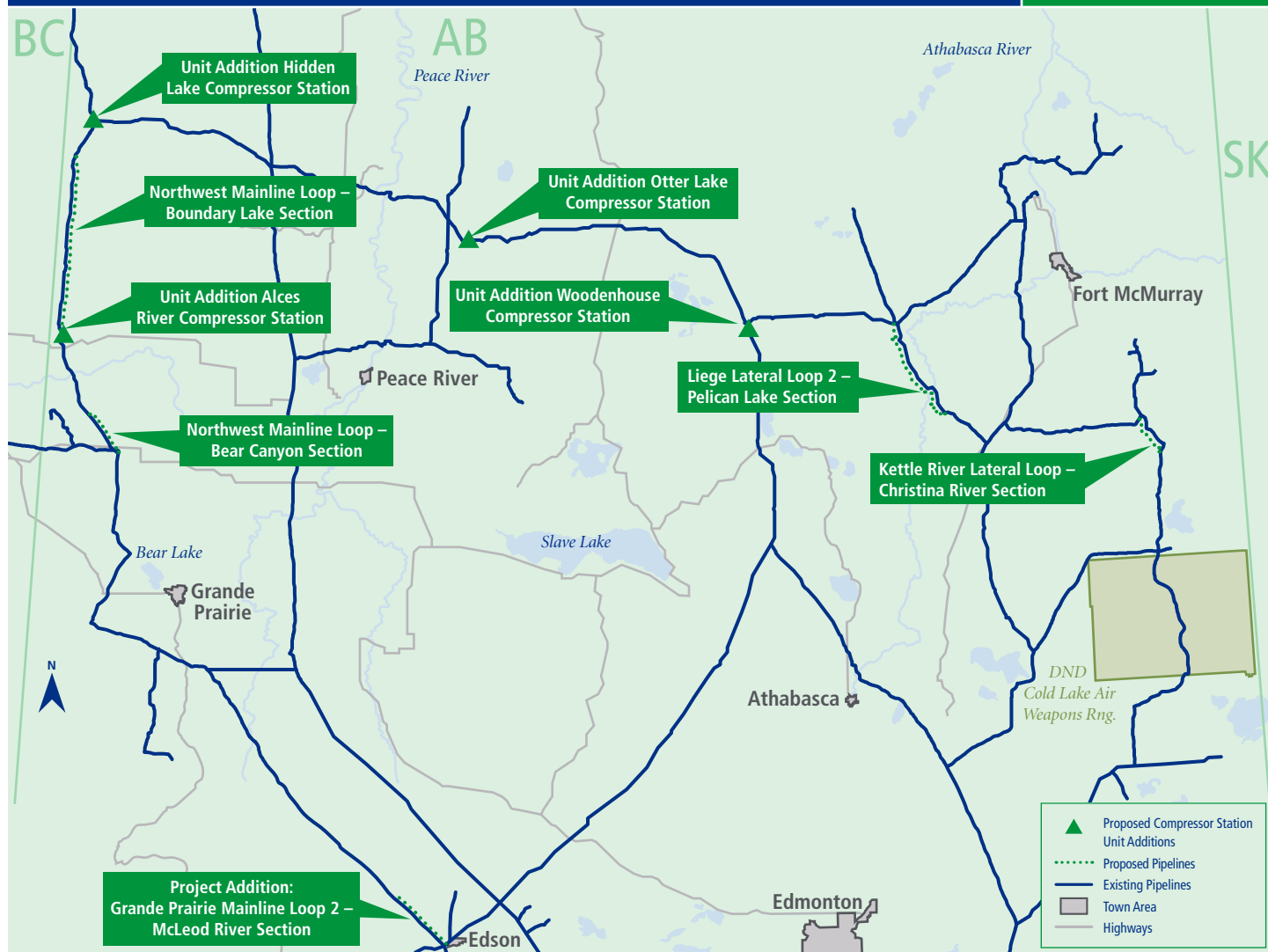




Appendix B

2017 NGTL System Expansion Fact Sheet

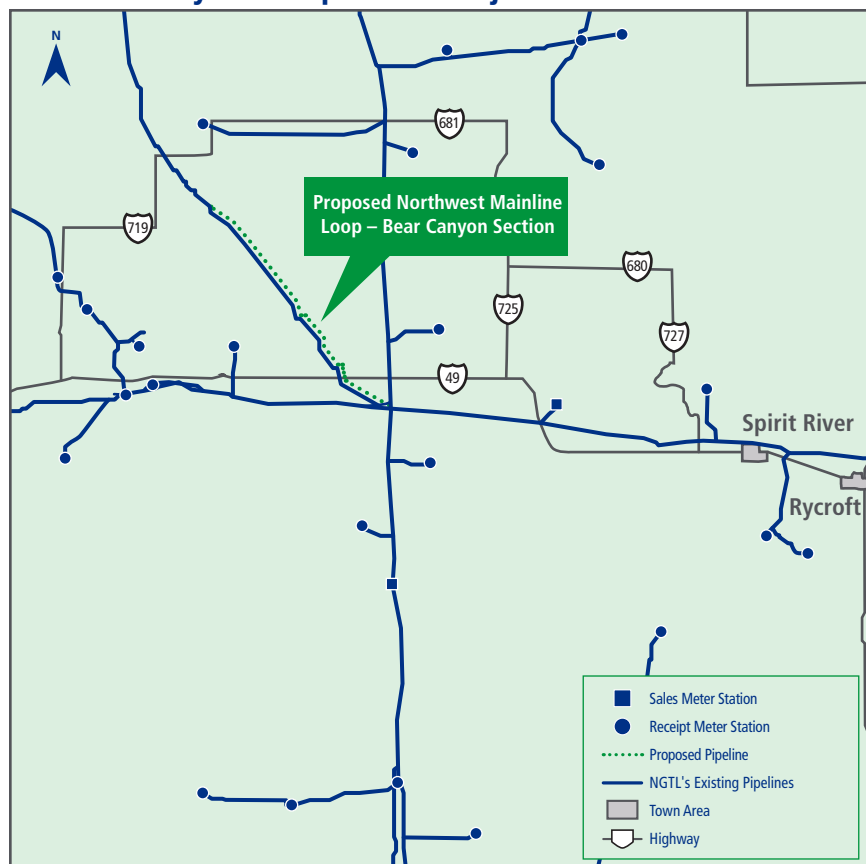
Project Update: 2017 NGTL System Expansion Project



NOVA Gas Transmission Ltd. (NGTL)* is proposing to construct and operate a multiple project expansion to its pipeline system in northern Alberta. There is an increased need for gas transportation service that is influenced by the pace and location of producer activity, commercial support and TransCanada's pipeline system capabilities. Based on these requirements, NGTL anticipates applying to the National Energy Board (NEB) for the proposed projects as one application under Section 52 of the National Energy Board Act in the first quarter of 2015.

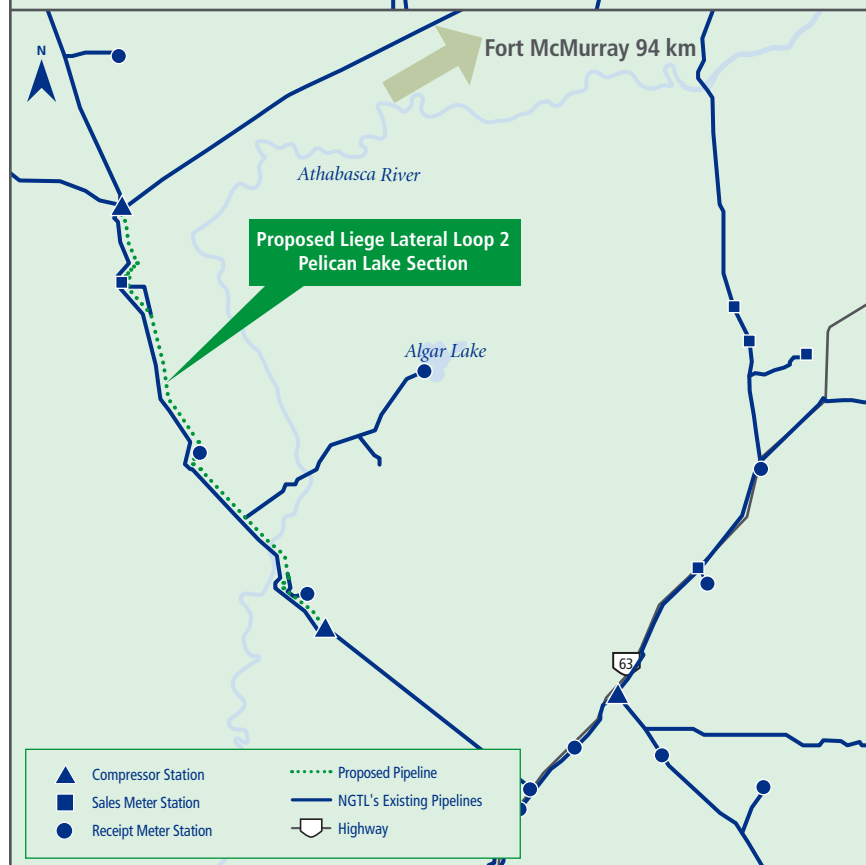
*NGTL is a wholly owned subsidiary of TransCanada PipeLines Limited (TransCanada).

2017 NGTL System Expansion Project



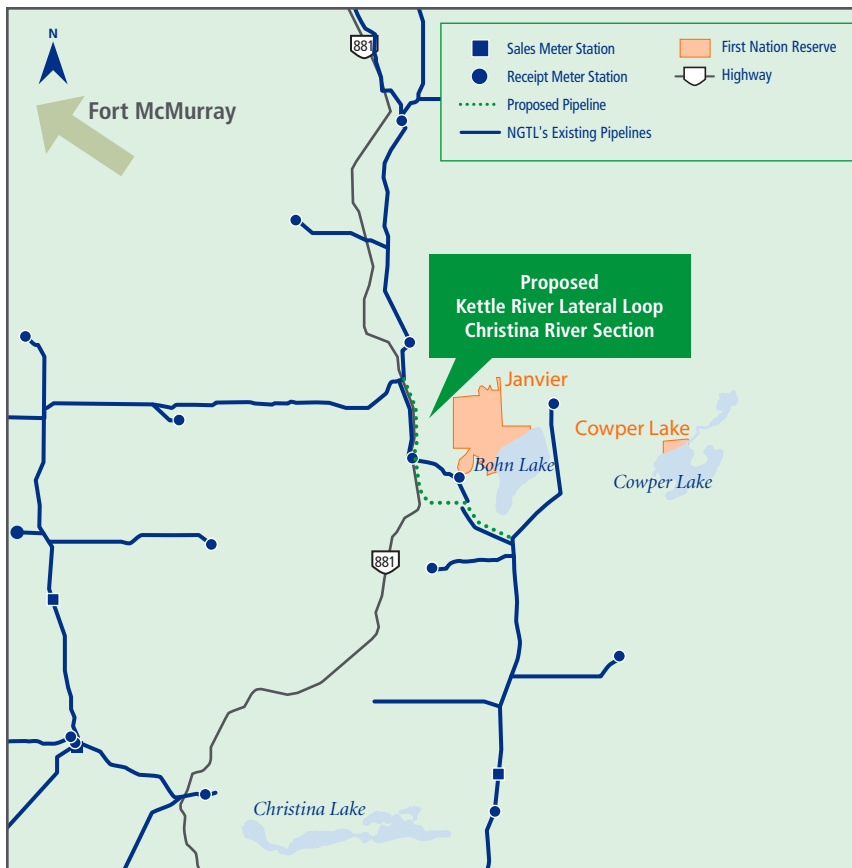
Northwest Mainline Loop (NWML) – Bear Canyon Section

The pipeline would be located approximately 32 kilometers (km) northwest of Spirit River, AB, in Saddle Hills County. It would consist of approximately 27 km of 36-inch diameter (914 mm) pipe installed as a loop of the existing Northwest Mainline. The pipeline would start at legal location SE-05-79-9-W6 and terminate at the existing mainline valve site at SW-35-80-11-W6.



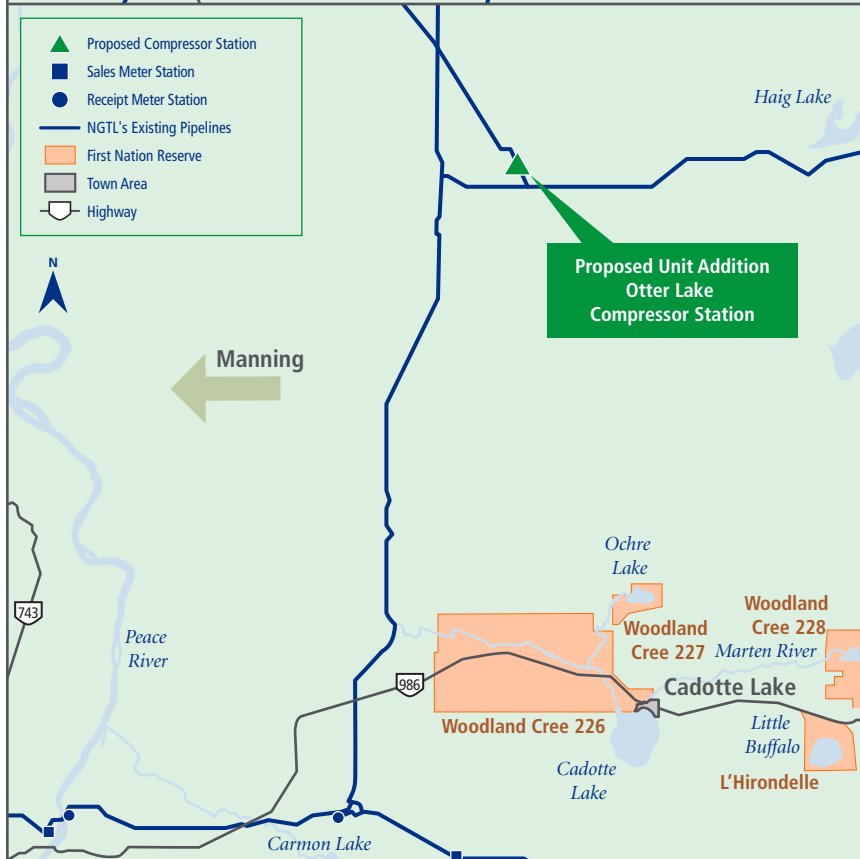
Liege Lateral Loop 2 – Pelican Lake Section

The pipeline would be located approximately 100 km southwest of Fort McMurray, AB, and approximately 75 km northeast of Wabasca, AB. It would consist of approximately 56 km of 30-inch (762 mm) diameter pipe installed as a loop of existing pipelines. This pipeline will connect to the Liege Lateral Loop 2 - Thornbury Section, for which an application has already been submitted to the National Energy Board. The pipeline would connect to existing facilities at the existing Buffalo Creek Compressor Station at legal location SW-19-86-18-W4 and end at the existing Pelican Lake Compressor Station at NE-30-81-16-W4.



Kettle River Lateral Loop – Christina River Section

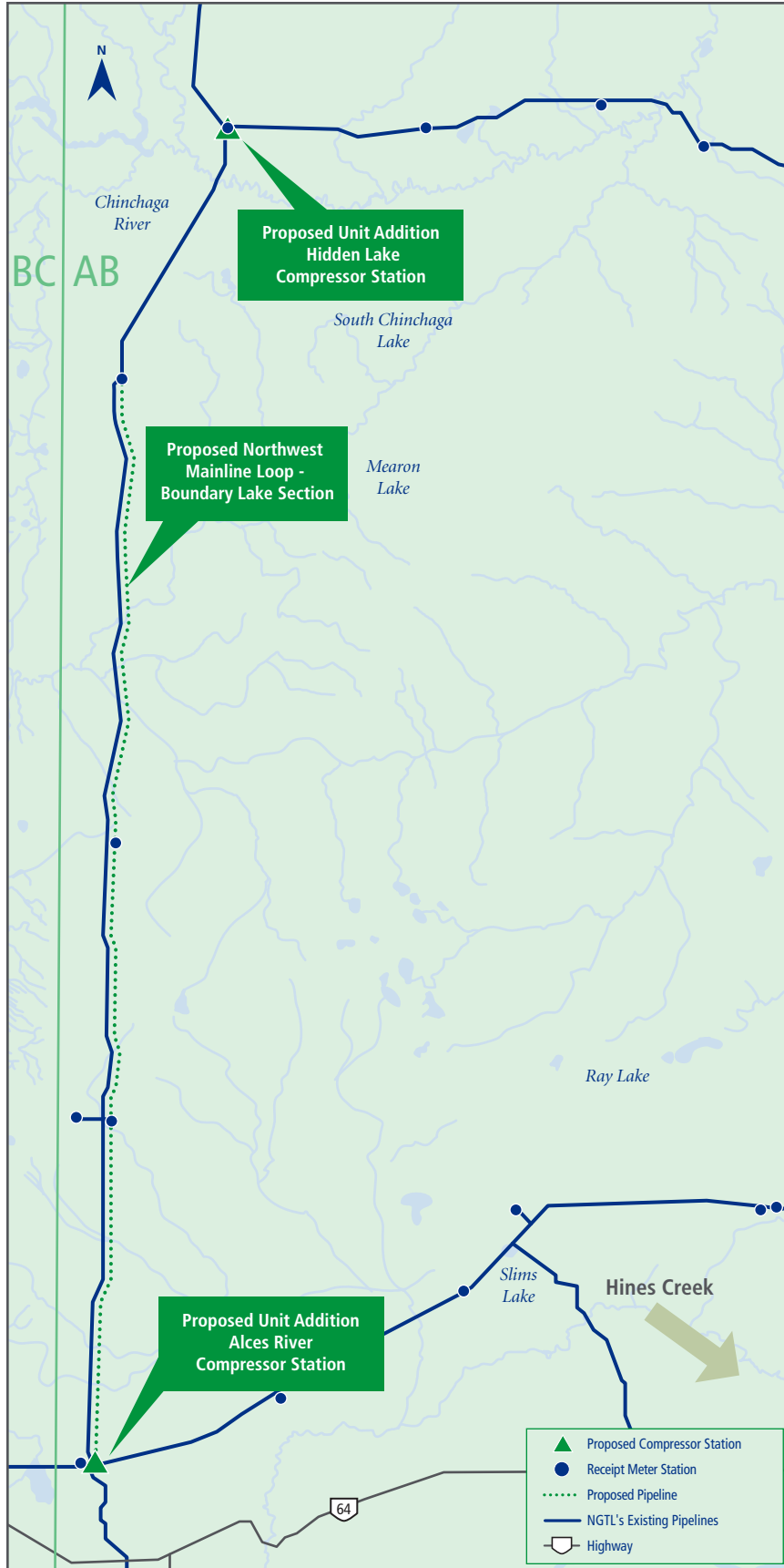
The pipeline would be located approximately 100 km southeast of Fort McMurray, AB. It would consist of approximately 20 km of 24-inch diameter (610 mm) pipe and tie into the existing Kettle River Lateral. The pipeline would start at legal location NW-26-080-06-W4 at the Leismer-Kettle River crossover and end at NW-14-079-05-W4 at the Graham and Graham Loop 2 junction.



Otter Lake Compressor Station Unit Addition

The proposed compressor unit addition, approximately 30 megawatts, would be added to the recently approved Otter Lake Compressor Station that will be in service in November 2015, located approximately 60 km east of Manning, AB, at 8-91-16 W5M. The maximum allowable operating pressure for the new unit would be 9930 kPa, to match the existing 9930 kPa system.

2017 NGTL System Expansion Project



Hidden Lake North Compressor Station Unit Addition

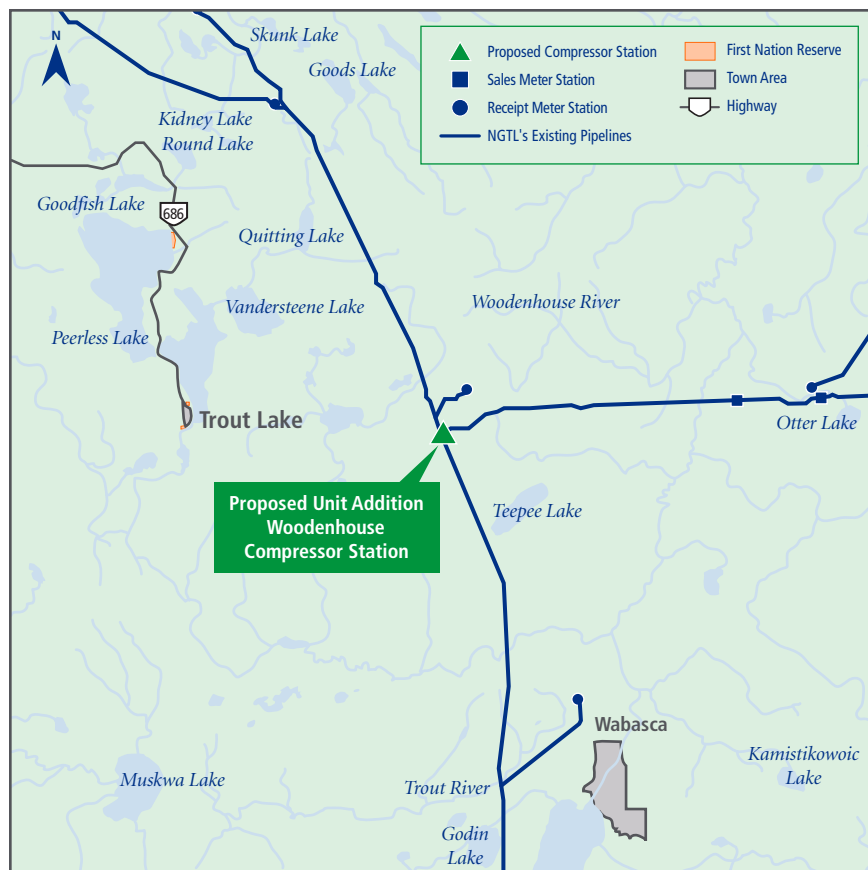
The proposed 15 megawatt compressor station would be located adjacent to the existing Hidden Lake North Compressor Station located approximately 180 km west of Manning, AB, at LSD 03-32-096-11-W6. The maximum operating pressure for the new unit would be 8450 kPa, to match the existing 8450 kPa system.

Northwest Mainline Loop – Boundary Lake Section

The pipeline would be located approximately six kilometers east of the Alberta/B.C. border in Clear Hills County, AB. It would consist of approximately 91 km of 36-inch diameter (914 mm) pipe installed as a loop of the existing Northwest Mainline. The pipeline would start at the Alces River Compressor Station at legal location NW-13-085-13-W6 and would end at the Owl Lake South Meter Station at legal location NE-20-094-12-W6.

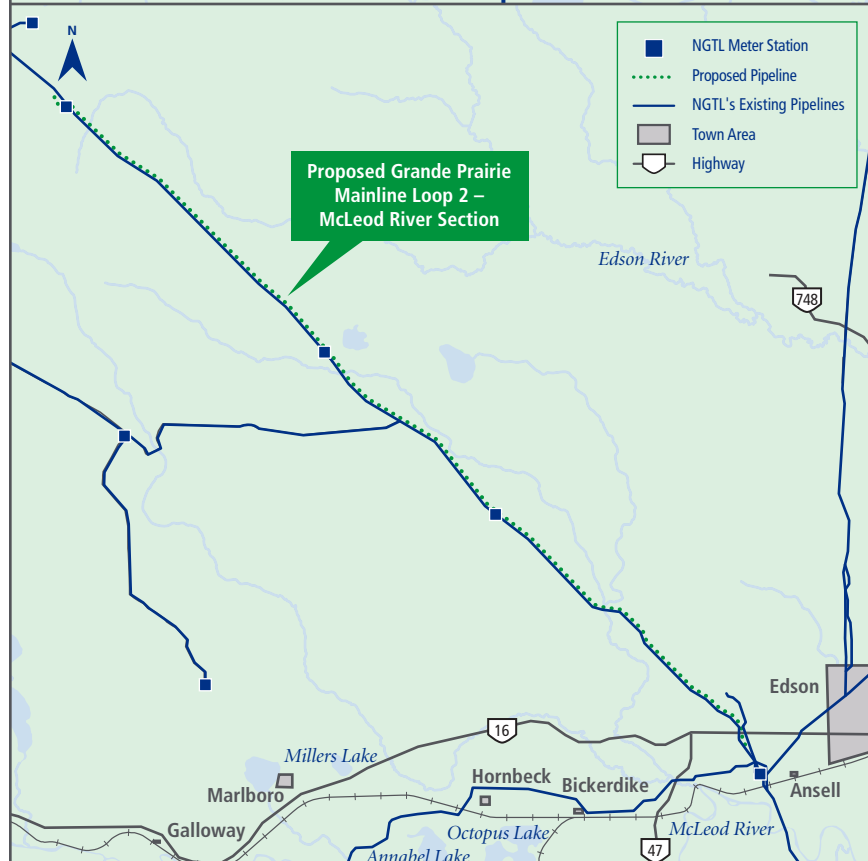
Alces River Compressor Station Unit Addition

The proposed 15 megawatt compressor unit would be added to the existing Alces River Compressor Station, located approximately 156 km northwest of Grande Prairie, AB, at NW-12-13-085-13-W6. The maximum operating pressure for the new unit would be 8450 kPa, to match the existing 8450 kPa system.



Woodenhouse Compressor Station Unit Addition

The proposed 30 megawatt compressor station would be located adjacent to the existing Woodenhouse Compressor Station located approximately 65 km northwest of Wabasca, AB, at LSD 07-29-086-01 W5. The maximum operating pressure for the new unit would be 9930 kPa, to match the existing 9930 kPa system.



Grande Prairie Mainline Loop 2 - McLeod River Section

The McLeod River Section was added to the 2017 NGTL System Expansion Project in late October 2014. The pipeline will consist of approximately 36 kilometres (km) of 48-inch diameter (1219 mm) pipe. The starting point of the pipeline will be at legal location NW-21-55-20-W5 and terminate at the existing valve site approximately five km west of Edson, AB, at legal location SE-11-53-18-W5.

2017 NGTL System Expansion Project



Project Schedule

- Environmental planning and design work Q3 2014
- Commence Aboriginal and stakeholder engagement Q3 2014
- Commence environmental & technical analysis Q3 2014
- Commence survey & field studies Q3 2014
- File project description with NEB Q4 2014
- Submission of an application to the National Energy Board Q1 2015
- Pending regulatory approvals, begin temporary infrastructure construction . . Q3 2016
- Begin pipeline and compressor station unit addition construction. Q3 2016
- Planned in service date for pipeline and compressor station projects 2017

Community Benefits

The proposed pipeline will offer short term and long term economic benefits and strengthen the economy on a local, provincial and national level.

Employment Opportunities – Construction will require the services of equipment operators, welders, mechanics, truck drivers, labourers and more.

Business Opportunities – Pipeline construction will create demand for local goods and services including food and accommodation, hardware, industrial parts, automotive parts and servicing, fuel and more.

Annual Revenue to Support Local Services – Pipeline construction will result in tax payments to municipal, provincial and federal governments. When the pipeline is operational, annual tax payments will help support schools and hospitals, emergency services, recreation facilities, recycling programs and other local programs vital to sustaining communities.

Investments in Local Communities – Through our engagement with local communities, we will identify areas where we can help build stronger, more vibrant communities through initiatives community partnerships in the areas of safety, community and environment.

Environmental Protection

As part of the regulatory application process, TransCanada collects and analyzes site-specific environmental information to help understand the potential environmental effects of the project and develop an Environmental and Socio-economic Assessment. Specifically, the assessment will consider impacts to soil, vegetation, wildlife, historical resources, current land use, traditional land use and aquatic resources. An Environmental Protection Plan (EPP) will also be developed to identify specific measures to mitigate effects of the project during and following construction. All projects will be constructed along existing rights-of-way, where possible, helping to minimize the impact on land and effects to the environment.

Stakeholder Engagement

Engaging with stakeholders means listening, providing accurate information, and responding to stakeholder interests in a prompt and consistent manner. TransCanada is proud of the relationships we have built with our neighbours for the last 60 years. Our four core values of integrity, collaboration, responsibility and innovation are at the heart of our commitment to stakeholder engagement. These values guide us in our interactions with our stakeholders. We invite public input on our proposed project and encourage interested parties to contact us.

Aboriginal Engagement

Building and maintaining relationships with Aboriginal communities near our proposed projects and existing facilities has long been an integral part of TransCanada's business. TransCanada works with communities to identify potential effects of company activities on each community to find mutually satisfactory solutions and benefits.

Building Stronger Communities

TransCanada awards contracts to qualified contractors through a competitive bid process and works with them to provide employment opportunities for local residents and local subcontractors. In addition, we are proud of the local partnerships we have formed in northern Alberta where we currently operate, and continue to invest in community initiatives to build stronger communities.

What to Expect During Construction and Beyond

During construction, there will be an increase in traffic flow in and around the project area. TransCanada will make efforts to minimize the traffic by selecting construction site locations close to the project. There will be heavy equipment on-site for earth moving, excavation material handling/hauling, welding and testing. After the facilities have been built, there will be minimal traffic associated with ongoing operations and maintenance. Strict adherence to construction plans and commitments in the EPP will ensure that the effects of construction activities on the local community are minimized. Construction activities typically generate a certain amount of noise. TransCanada will meet applicable limits on noise throughout construction and the ongoing operations of the project. Measures will be taken to prevent topsoil/surface material loss from wind and water erosion, topsoil and subsoil mixing, and to establish a vegetative cover that is compatible with surrounding vegetation and land use.

Once construction has been completed, the land surface will be reclaimed. On freehold lands, landowners will have the right to fully use and enjoy the right-of-way without having to notify TransCanada as long as the operation and integrity of the pipeline is not compromised. Pipeline crossings by agricultural vehicles and mobile equipment for normal agricultural purposes are allowed as long as there is no disturbance deeper than 30 centimeters.

Pipeline Safety

For more than 60 years, TransCanada has been a leader in the safe and reliable operation of North American energy infrastructure. From design to construction, to operations and maintenance, safety is integral to everything we do. We use top quality steel and industry-leading welding techniques throughout our pipeline system to ensure we meet and exceed industry standards. We take additional safety precautions when the pipeline crosses roads, railways, waterways and communities.

During construction, welds are checked by x-ray and/or ultrasonic inspection methods and then we pressure-test the pipe, which is coated to protect against corrosion. We also use "smart pigs" – sophisticated inspection devices – to record information about the internal conditions of the pipeline. TransCanada monitors its pipeline 24 hours a day, 365 days a year. Satellite technology sends data to our monitoring centre every five seconds. If a drop in pressure is detected, we immediately identify the problem area and isolate that section of the pipe remotely, closing the valves that control the flow of gas. Trained crews are dispatched by land or helicopter, depending on the location of the leak. If there is an incident, we work closely with authorities, emergency responders and the media to ensure residents in the area are aware of the situation and are safe.



2017 NGTL System Expansion Project



Emergency Preparedness and Response

The proposed pipeline will be designed, built and operated in a safe and environmentally responsible manner. In the unlikely event of an emergency, our comprehensive Emergency Response Program would be activated. We train our staff to know exactly what to do in the event of an emergency - both during construction and ongoing operations and work with area emergency responders to ensure a coordinated response in the event of an incident.

In case of an emergency, please call TransCanada's 24-hour toll free number at 1.888.982.7222.

About TransCanada

We are a Canadian company, with over 60 years of experience building and operating pipelines throughout North America. We are an industry leader in safety and reliability. We believe in making a positive difference in the lives of others by investing in our communities. TransCanada demonstrates our commitment to being a good neighbour, a strategic community partner and an employer of choice.

TransCanada plays a vital role in connecting energy supplies to key North American markets with \$54 billion in assets in our natural gas pipelines, energy, and oil pipelines portfolios.

We operate one of the largest natural gas transmission networks in North America – 68,500 km – tapping into virtually every major gas supply basin and transporting approximately 20 per cent of the continent's daily natural gas supply. We are North America's third largest provider of natural gas storage and related services with more than 400 billion cubic feet of storage capacity.

We own or have interests in 21 power facilities with the capacity to generate 11,800 megawatts (MW) of electricity, enough to power more than 12 million homes. One-third of the power we produce comes from emission-less sources including nuclear, hydro, wind and solar.

Our success is a reflection of our exceptional team of almost 5,500 employees who bring skill, experience, energy and dedication to the work they do every day. Our employees are an important part of the communities where we operate in seven Canadian provinces, 31 U.S. states and six states in Mexico.

You can find out more about TransCanada by visiting www.TransCanada.com

Contact Us

We invite you to contact TransCanada with any questions or comments you have about the proposed project:

Phone: 1.855.458.6713

mail: ngtl_2017@transcanada.com

or write the project team at:

TransCanada

Cole Thomson,
Senior Community Relations Advisor
450 – 1st Street SW
Calgary, Alberta T2P 5H1

If you would like further information regarding the National Energy Board's approval process, we would be pleased to provide you with information or you can contact the regulator directly:

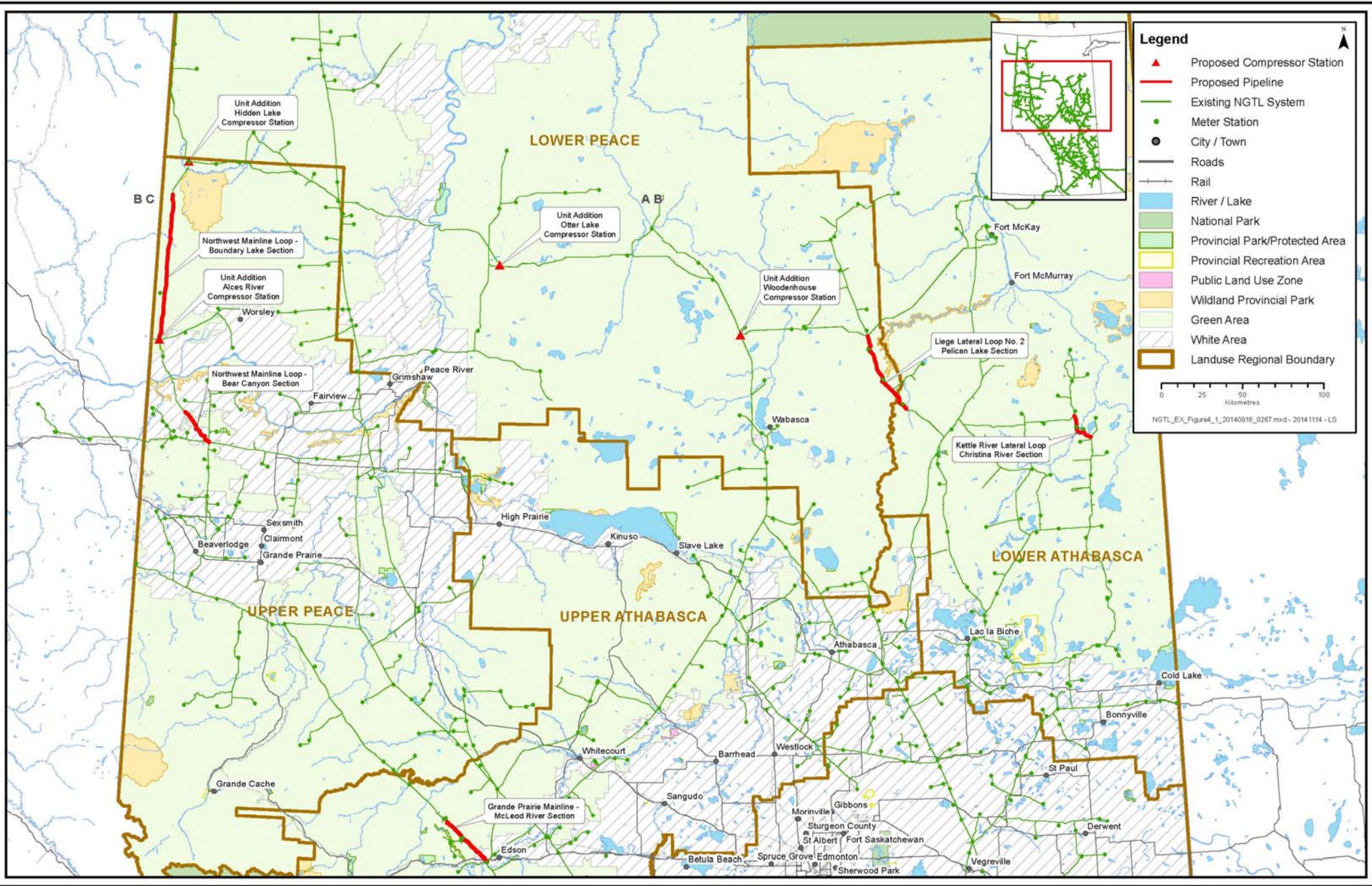
National Energy Board

517 Tenth Avenue SW
Calgary, AB T2R 0A8
Phone: 1.800.899.1265
Email: info@neb-one.gc.ca
www.neb-one.gc.ca

This information contains forward-looking information prepared solely for the purposes of providing information about TransCanada's proposed system expansion and is not intended to be relied upon for the purposes of making investment decisions. Readers are cautioned not to place undue reliance on such forward-looking information as it is subject to corporate, regulatory and various third party approvals and conditions.

Appendix C

Environmental Areas



Appendix D

Aboriginal Communities Maps

