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Trans Mountain Pipeline ULC

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May 23, 2013

National Energy Board  
444 Seventh Avenue SW  
Calgary, AB  
T2P 0X8  
Canada

Attention: Sherri Young, Secretary of the Board

**Re: Application for Pipeline Facilities Certificate for the Trans Mountain Expansion Project**

Dear Madam:

Trans Mountain Pipeline ULC (Trans Mountain) hereby submits to the National Energy Board (NEB) a project description for the Trans Mountain Expansion Project, prepared in accordance with the NEB's *Filing Manual*. The recent NEB Reasons for Decision RH-001-2012 concerning Trans Mountain's tolls and tariff application provides the solid financial grounding that Trans Mountain requires to proceed with development of an application under Section 52 of the *National Energy Board Act* (NEB Act) for the proposed project.

In response to growing market demand and customer contractual commitments, Trans Mountain proposes to expand the existing Trans Mountain Pipeline System by 93,800 m<sup>3</sup>/d (590,000 bbl/d) from 47,690 m<sup>3</sup>/d (300,000 bbl/d) to 141,500 m<sup>3</sup>/d (890,000 bbl/d). If approved, the proposed expansion will comprise:

- pipeline facilities that complete a twinning of the pipeline in Alberta and British Columbia with about 981 km of new buried pipeline
- new and modified facilities, such as pump stations and tanks
- additional tanker loading facilities at the Westridge Marine Terminal in BC

Starting in 2012, Trans Mountain began a comprehensive engagement process with Aboriginal peoples, landowners, municipalities and stakeholders. During this process, these groups expressed their desire for Trans Mountain to address issues in its application, including environmental protection, potential spills, emergency response capabilities, jobs and economic opportunities. Trans Mountain is working with these groups to better define their issues and concerns and address them through development of its facilities application and the project.

The proposed project represents an expansion of the existing Trans Mountain pipeline system (i.e., most of the new proposed pipeline will be adjacent to the existing pipeline or along existing corridors), and as such, it is not clear to Trans Mountain if the project would be a designated project under the *Canadian Environmental Assessment Act, 2012* (CEAA, 2012). However, based on the level of public interest in

the proposed project, Trans Mountain believes the expansion project should be a designated project, and subject to a rigorous environmental review required under both the NEB Act and CEAA, 2012. Therefore, Trans Mountain requests that the Trans Mountain Expansion Project be deemed a designated project under CEAA, 2012.

As Trans Mountain develops its application and project, Trans Mountain is committed to building upon its 60-year operating history and the relationships it has developed with Aboriginal groups, communities, landowners and stakeholders along the pipeline route. As president, I am personally committed to being actively engaged in these efforts as the application and proposed project are developed.

Please direct any questions regarding this project description to Carey Johannesson, regulatory lead, at (403) 514-6448.

Sincerely,

(original signed by)

Ian Anderson  
President



**TRANSMOUNTAIN**  
Trans Mountain Pipeline ULC

**PROJECT DESCRIPTION  
FOR THE PROPOSED  
TRANS MOUNTAIN EXPANSION PROJECT**



Submitted to the National Energy Board  
by Trans Mountain Pipeline ULC

**May 2013**



# **Project Description for the Trans Mountain Expansion Project**

May 2013

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## 1.0 EXECUTIVE SUMMARY

### 1.1 Project Summary

Trans Mountain Pipeline ULC (Trans Mountain) is a Canadian corporation with its head office located in Calgary, Alberta (AB). Trans Mountain is a general partner of Trans Mountain Pipeline L.P., which is operated by Kinder Morgan Canada Inc. (KMC), and fully owned by Kinder Morgan Energy Partners, L.P. Trans Mountain is the holder of the National Energy Board (NEB) certificates for the Trans Mountain pipeline system (TMPL system or system).

The TMPL system was established almost 60 years ago and currently has a capacity of about 300,000 bbl/d. The TMPL system transports a range of crude oil and petroleum products from western Canada to locations in central and southwestern British Columbia (BC), Washington and offshore.

Trans Mountain currently supplies much of the crude oil and refined products used in BC. The existing TMPL system is operated and maintained by staff located at Trans Mountain's regional and local offices in Alberta (Edmonton, Edson, Jasper, Clearwater) and BC (Kamloops, Hope, Abbotsford and Burnaby).

In response to growing market demand and customer contractual commitments, Trans Mountain proposes to expand the existing TMPL system by 93,800 m<sup>3</sup>/d (590,000 bbl/d) from 47,690 m<sup>3</sup>/d (300,000 bbl/d) to 141,500 m<sup>3</sup>/d (890,000 bbl/d). If approved, the proposed expansion will comprise:

- pipeline facilities that complete a twinning of the pipeline in Alberta and British Columbia with about 981 km of new buried pipeline
- new and modified facilities, such as pump stations and tanks
- additional tanker loading facilities at the Westridge Marine Terminal in BC

The stated capacity is based on preliminary hydraulic analyses and will be confirmed in Trans Mountain's application to the NEB through a more detailed hydraulic analysis, with consideration for system variability based on estimated batch lineup and overall system reliability.

With the additional facilities and pipeline being proposed, the TMPL system will be comprised of two pipelines, the existing line (Line 1) and a new line (Line 2). The TMPL system will continue to operate as a batched pipeline system, allowing for transportation of light and heavy crude oils and refined products. As part of the project approval process, Trans Mountain will review its existing operations (i.e., staff levels, operations facilities, pipeline protection and integrity programs) and make appropriate adjustments to support the proposed expanded TMPL system.

If approved, the expanded Line 1 will be capable of transporting 55,640 m<sup>3</sup>/d (350,000 bbl/d) and will provide a batched transportation service for refined products and light crude oils. Line 1 will also be capable of transporting heavy crude oils at a reduced capacity.

The proposed Line 2 will be capable of transporting 85,850 m<sup>3</sup>/d (540,000 bbl/d) of heavy crude oils and will also be capable of transporting light crude oils, if necessary.

The proposed Trans Mountain Expansion Project (the project) will require a certificate pursuant to Section 52 of the *National Energy Board Act* (NEB Act) to permit construction and operation of the expanded pipeline system in Canada. Trans Mountain expects to file its application with the NEB in late 2013.

This Project Description (PD) does not constitute a project application. Once filed, the NEB Section 52 application will constitute Trans Mountain's formal application to the NEB seeking approval for the proposed facilities. The application will form the basis for the regulatory process and public hearings for the project.

In developing its NEB application, Trans Mountain has implemented an extensive program to consult with landowners, affected municipalities and stakeholders, and to engage Aboriginal peoples. The consultation program is intended to address questions and concerns, gather input from these groups for the application and the supporting environmental and socio-economic assessment (ESA), and also to assist Trans Mountain in the design and execution of the project. Trans Mountain is also working with various federal, provincial and municipal authorities to carry out additional reviews, studies and assessments for the project, and to address their questions and concerns.

## **1.2 Contact Information**

All communication with Trans Mountain concerning this PD should be directed to:

Carey Johannesson, Project Lead Regulatory and Land  
Kinder Morgan Canada Inc.  
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Information on the project is also available at [www.transmountain.com](http://www.transmountain.com).

## 2.0 NATURE OF THE PROJECT

This PD for the Trans Mountain Expansion Project has been prepared in accordance with the NEB's guideline for pre-application project descriptions. For more information, see the NEB's website at:

<http://www.neb-one.gc.ca/clf-nsi/rpblctn/ctsndrgltn/rrggngmpnb/prpplctnprjctdscrptn-eng.html>.

This document provides an overview of the proposed project, its future operation, consultation programs, and a description of the potential environmental and socio-economic interactions and effects of the project at the time of its publication. In accordance with the NEB's *Filing Manual*, Trans Mountain will continue to evaluate alternatives, such as:

- changes to facilities and equipment (e.g., pump stations, valves)
- route deviations, including start and end points

The PD will be used by the NEB to initiate several pre-application activities. It also serves to inform landowners, Aboriginal peoples, other regulatory authorities, communities and stakeholders of the project's proposed nature and intent.

Under Section 52 of the NEB Act, this PD does not constitute an application to construct the project. The PD is a preliminary submission provided for information purposes only. Under Section 52 of the NEB Act, Trans Mountain plans to file a project application in late 2013 to construct and operate the project. Once filed, the NEB Section 52 application will constitute Trans Mountain's formal application to the NEB seeking approval for the proposed facilities. The application will form the basis for the regulatory process and public hearings for the project.

Trans Mountain is proceeding with the project scope described in this PD for the regulatory application required to obtain a certificate under Section 52 of the NEB Act. A comprehensive ESA and associated public hearing process will be required as part of the NEB regulatory process for the project.

### 2.1 Background

In operation since 1953, the TMPL system transports a range of crude oil and petroleum products from Alberta, including:

- crude petroleum deliveries to Burnaby and the Westridge Marine Terminal for offshore export to California, the United States (US) Gulf Coast and Asia, and to the Sumas Terminal for deliveries on the Trans Mountain Pipeline (Puget Sound) LLC pipeline to Anacortes, Ferndale, and Cherry Point in Washington.
- refined product deliveries to Kamloops and Port Moody, BC

The system consists of:

- the pipeline
- 24 pump stations
- four terminals
- one marine loading terminal

The TMPL system is about 1,150 km long. Starting at the Edmonton Terminal, the pipeline runs west paralleling Highway 16 through Jasper National Park, then southwest along Highway 5 to the Kamloops Terminal, and continues southwest, generally paralleling Highway 5 to the Sumas Terminal near Abbotsford, terminating at the Burnaby Terminal. From the Burnaby Terminal, local distribution pipelines connect to Chevron's Burnaby Refinery, the Suncor marketing terminal, and the Westridge Marine Terminal.

The four TMPL system terminals have a combined storage capacity of 840,200 m<sup>3</sup> (5,284,700 bbl). The terminals also house ancillary equipment, such as meters and booster pumps. The Westridge Marine Terminal has a single loading dock, capable of accommodating tankers and barges with a capacity of up to 120,000 dead weight tonnes.

As authorized by NEB Certificate OC-2, the TMPL system was constructed in 1952 through 1953 and consisted of:

- a 609.6 mm (24 inch) outside diameter (OD) pipeline
- four pump stations
- the Westridge Marine Terminal

In August 2007, Certificate OC-2 was amended to Certificate AO-2-OC-2 to reflect the change in the name of the holder of the NEB certificate to Trans Mountain Pipeline Inc., as general partner to Trans Mountain Pipeline, L.P.

At the start of operations, the TMPL system had a capacity of 23,850 m<sup>3</sup>/d (150,000 bbl/d) and served refineries in British Columbia and Washington. Shipments from the Westridge Marine Terminal started in 1956 and have continued since that time. Since the initial construction, a series of incremental expansions have occurred to the pipeline, pump stations and the Westridge Marine Terminal in response to changing market conditions, including:

- construction of two 80-km pipeline loop segments, pump stations and an expansion of the Westridge Marine Terminal dock in response to increasing demand (1957)
- addition of pump stations in response to increasing demand (late 1960s)
- demolition of a number of pump stations and idling of loop segments in response to reduced demand (early 1980s)
- modifications to enable transportation of refined products to Kamloops (1985)
- addition of pump stations to allow transportation of heavy crude oil, including tank builds (1986-1988)
- modifications to enable transportation of methyl tertiary-butyl ether (a fuel additive) (1992)
- modifications to enable transportation of refined products to the BC Lower Mainland – coincided with the closure of three Lower Mainland refineries (1993 and 1994)
- construction of a pump station and reactivation of one existing loop section in response to increasing demand (1996)
- construction of a pump station and reactivation of one existing loop section in response to increasing demand (2004)

The most recent TMPL system upgrades, constructed between 2006 and 2008, include:

- the pump station expansion, which involved constructing 12 new pump stations (approved by NEB Order XO-T099-15-2005, November 2005)
- the Blue River Pump Station Project, which involved constructing one new pump station (approved by NEB Order XG-T099-02-2007, April 2007)
- the Anchor Loop Project (approved by Certificate OC-49, November 2006. In August 2007, Certificate OC-49 was amended to Certificate AO-1-OC-49). The Anchor Loop Project involved:

- constructing two pipeline segments, one 762.0 mm (30 inch) OD segment and one 914.4 mm (36 inch) OD segment, totalling about 160 km
- installing two pump stations

The TMPL system now has an operating capacity of 47,690 m<sup>3</sup>/d (300,000 bbl/d) using 24 active pump stations and 40 tanks.

Trans Mountain's Edmonton Terminal Expansion Project, which is currently underway, involves constructing 10 new tanks and associated facilities at the Edmonton Terminal. This project was approved by the NEB in March 2008 and is now being constructed under Amending Order AO-005-XO-T246-04-2008. In February 2013, Trans Mountain applied to the NEB to vary Amending Order AO-005-XO-T246-04-2008 to permit construction of four additional tanks at the Edmonton Terminal. The 10 new tanks will be in service in August to November 2013, and the additional four tanks will be in service in August to October 2014.

## 2.2 Commercial Basis for the Project

Trans Mountain held an open season that commenced on October 2011 and completed in November 2012. This process resulted in 13 shippers executing firm service transportation agreements for 15- and 20-year terms. The total contracted volume under these agreements is 112,480 m<sup>3</sup>/d (707,500 bbl/d). The remaining 29,020 m<sup>3</sup>/d (182,500 bbl/d) of pipeline capacity will be reserved for uncommitted or spot shippers.

In June 2012, Trans Mountain filed a toll application with the NEB respecting the contract terms and toll structure that would be implemented on the proposed Trans Mountain Expansion Project. On May 17, 2013, the NEB approved the toll application in its Reasons for Decision RH-001-2012. The toll application decision document is available on the NEB's website at:

<https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/130635/customview.html?func=ll&objId=130635&objAction=browse&redirect=3>

The recent NEB decision RH-001-2012 reinforces the market support for the project and provides the necessary economic certainty to proceed with development of the Section 52 facilities application for the project.

## 2.3 Project Scope

The Trans Mountain Expansion Project will represent a major expansion of the existing TMPL system. Based on binding commercial support, Trans Mountain will apply, under Section 52 of the NEB Act, for a certificate to expand the pipeline to a capacity of 141,500 m<sup>3</sup>/d (890,000 bbl/d).

The scope of the project will involve:

- using existing active 609.6 mm (24 inch) and 762.0 mm (30 inch) OD buried pipeline segments
- constructing three new 914.4 mm (36 inch) OD buried pipeline segments totalling about 973 km:
  - Edmonton to Hinton – 335 km long
  - Hargreaves to Darfield – 275 km long
  - Black Pines to Burnaby – 363 km long
- reactivating two 609.6 mm (24 inch) OD buried pipeline segments that have been maintained in a deactivated state:

- Hinton to Hargreaves – 150 km long
- Darfield to Black Pines – 43 km long
- constructing two 4 km long 762.0 mm (30 inch) OD delivery lines from the Burnaby Terminal to the Westridge Marine Terminal (the Westridge delivery line)
- removing the existing tanker dock at the Westridge Marine Terminal and constructing two new loading docks with a total of three berth faces, and a utility dock to support expanded operations
- adding 33 new pumping units at 10 locations (i.e., nine existing and one new pump station site)
- reactivating the existing Niton pump station that has been maintained in a deactivated state
- deactivating four existing pump stations at Albreda, Stump, Hope and Wahleach, if further studies indicate that these stations are not required for reliability
- adding 21 new tanks located at the Edmonton, Sumas and Burnaby terminals

The three new pipeline segments, together with the reactivation of the two existing deactivated segments, will result in two parallel pipelines:

- Line 1, consisting only of existing pipeline segments, will have a sustainable capacity of 55,640 m<sup>3</sup>/d (350,000 bbl/d)
- Line 2, consisting of the new segments and two existing active segments (i.e., from Hinton to Hargreaves, and Darfield to Black Pines), will have a sustainable capacity of 85,850 m<sup>3</sup>/d (540,000 bbl/d)

The twin parallel pipeline configuration of the proposed TMPL system expansion is shown in Figure 2-1.

### 2.3.1 Pipelines

Once completed, the expanded TMPL system will consist of two parallel pipelines (i.e., the existing Line 1 and the new Line 2). The pipeline segments that will form the existing Line 1 and the new Line 2, including the new segments, existing active and deactivated pipeline segments are shown in Table 2-1.

**Table 2-1: Configuration of the Expanded TMPL System**

Line 2 (New)					Line 1 (Existing)				
From	To	NPS		Status	From	To	NPS		Status
		mm	Inches				mm	Inches	
Edmonton, AB	Hinton, AB	914.4	36	New	Edmonton, AB	Edson, AB	609.6	24	Active
					Edson, AB	Hinton, AB	762.0	30	Active
Hinton, AB	Hargreaves, BC	914.4	36	Active	Hinton, AB	Hargreaves, BC	609.6	24	Reactivated
Hargreaves, BC	Darfield, BC	914.4	36	New	Hargreaves, BC	Darfield, BC	609.6	24	Active
Darfield, BC	Black Pines, BC	762.0	30	Active	Darfield, BC	Black Pines, BC	609.6	24	Reactivated
Black Pines, BC	Burnaby, BC	914.4	36	New	Black Pines, BC	Kamloops, BC	762.0	30	Active
					Kamloops, BC	Burnaby, BC	609.6	24	Active

Note:  
 New = pipeline segments that will be constructed as part of the project.  
 Active = existing segments that currently provide transportation service.  
 Reactivated = existing segments that have been maintained in a deactivated state that will be reactivated as part of the project.  
 AB = Alberta, BC = British Columbia

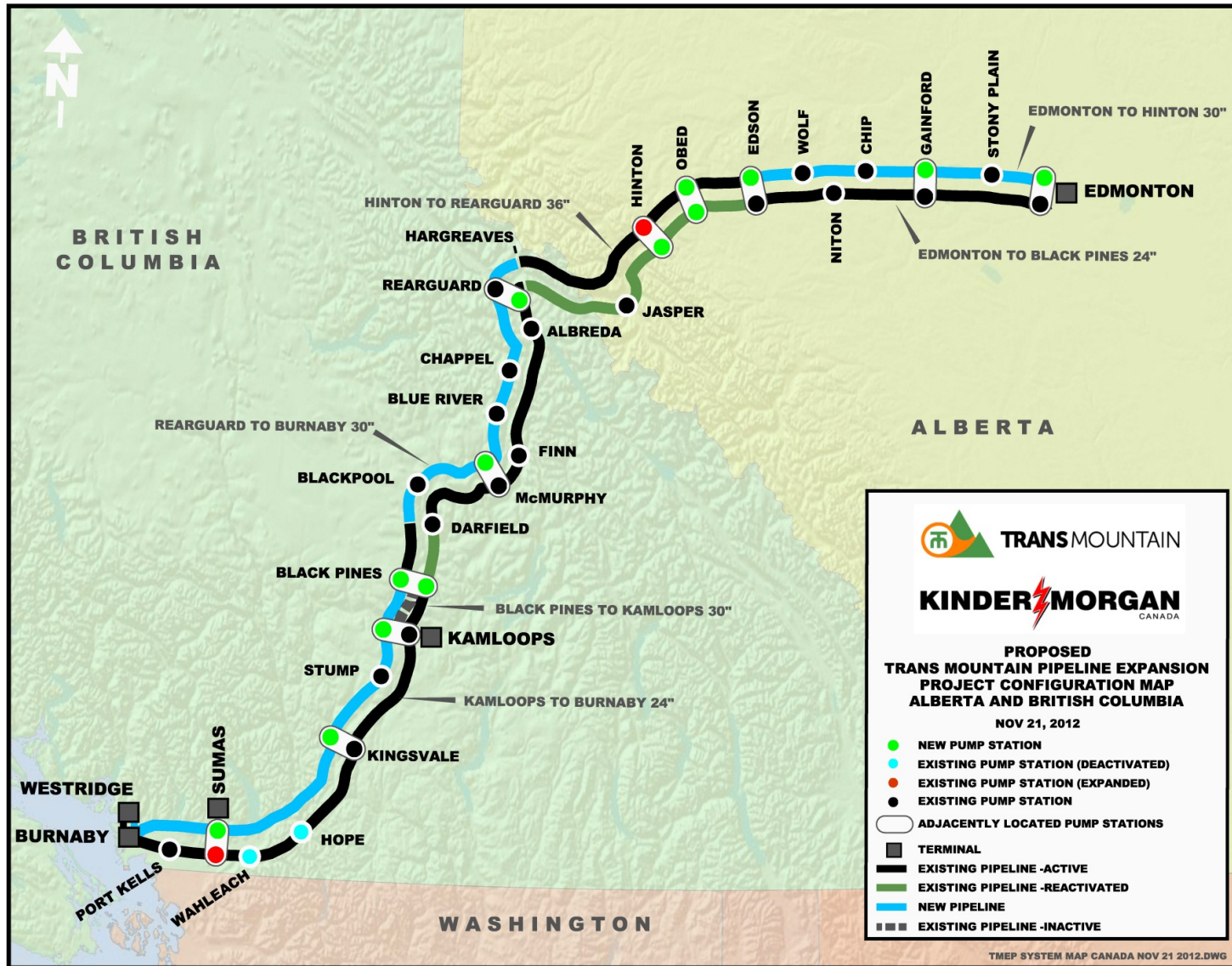


Figure 2-1: Trans Mountain Expansion Project Configuration

The Westridge delivery line connecting the Burnaby Terminal to the Westridge Marine Terminal will be expanded by installing two new lines.

### 2.3.1.1 *Line 1 (Existing Line)*

Line 1, including the components of the project, will consist of:

- active 609.6 mm (24 inch) OD buried pipeline segments from:
  - Edmonton to Edson
  - Hargreaves to Darfield
  - Kamloops to Burnaby
- active 762.0 mm (30 inch) OD buried pipeline segments from:
  - Edson to Hinton
  - Black Pines to Kamloops
- reactivated 609.6 mm (24 inch) OD buried pipeline segments from:
  - Hinton, AB, to Hargreaves
  - Darfield to Black Pines

Once fully active, Line 1 will have a sustainable capacity of about 55,640 m<sup>3</sup>/d (350,000 bbl/d) based on an assumed slate of light crude oils and refined products. Although it is expected that Line 1 will be dedicated to lighter petroleum products, it will be designed to allow for the batching of heavy crude oils, if required.

### 2.3.1.2 *Line 2 (New Line)*

Line 2 will consist of:

- three new 914.4 mm (36 inch) OD buried pipeline segments from:
  - Edmonton to Hinton
  - Hargreaves to Darfield
  - Black Pines to Burnaby
- the existing and active 914.4 mm (36 inch) OD buried pipeline segment from Hinton to Hargreaves
- the existing and active 762.0 mm (30 inch) OD buried pipeline segment from Darfield to Black Pines

These existing and new segments will form Line 2 and will have a sustainable capacity of about 85,850 m<sup>3</sup>/d (540,000 bbl/d) based on an assumed slate of heavy crude oils.

Line 1 and Line 2 will be able to provide a batched transportation service for a variety of crude types and products, with a combined sustainable capacity of 141,500 m<sup>3</sup>/d (890,000 bbl/d). This operating capacity assumes an availability factor of 0.95 to allow for planned and unplanned system shutdowns and maintenance. Assuming 20% of the batch lineup is heavy oil, the current operating capacity of the TMPL system is 47,690 m<sup>3</sup>/d (300,000 bbl/d). On this basis, the project will increase the existing TMPL system capacity by 93,800 m<sup>3</sup>/d (590,000 bbl/d).

### 2.3.1.3 *Westridge Delivery Line*

The Westridge delivery line will be expanded by constructing two new 762.0 mm (30 inch) OD pipeline segments between the Burnaby Terminal and the Westridge Marine Terminal. These two additional lines will work in conjunction with the existing 609.6 mm (24 inch) OD line to provide increased loading capability to the expanded Westridge Marine Terminal.



### **2.3.1.4 Valve Automation**

The expanded pipeline design will include remotely operated mainline block valves (MLBVs) for emergency shutdown and isolation of pipeline segments. New MLBVs will be installed on Line 2 with automation or check valves, as required. Reactivated segments of Line 1 will include automation of MLBVs. As part of the current operations, sections of Line 1 currently in operation are subject to a technical review with supplemental automation of MLBVs addressed as part of ongoing operations.

### **2.3.2 Pump Stations**

#### **2.3.2.1 New Pump Stations**

A total of 11 new pump stations will be required for the project:

- nine at existing pump station sites
- two at a new common site

Nine new pump stations will be located at existing pump station sites. These pump stations will have 27 3,730 kW (5,000 hp) pump units. Each new pump station will require a new electrical substation adjacent to the existing substation. Eight of the pump stations will require a new power feed from the existing adjacent transmission or distribution lines. The new pump station at Kingsvale will require a new transmission line. Additional land and access road requirements at these existing sites are expected to be minimal.

Two new pump stations will be required at a new common site at Black Pines. One pump station will have two 3,730 kW (5,000 hp) pump units, and the other pump station will have two 1,865 kW (2,500 hp) pump units. The final location of the two new pump stations will be based on hydraulic optimization, utility power availability, land use, environmental considerations and Aboriginal and landowner input. Each pump station site will require a new electrical substation both of which will be served by a new power line from the utility transmission serving the area. New land will be required for this common site.

The pump station located at Edmonton will be a five-unit station, and the pump station at Kamloops will be a four-unit station. Each of these critical stations will include an installed spare pump unit to prevent pipeline operations from being substantially affected if an operating pump unit were to fail. The pump stations located at Gainford, Edson, Hinton and Blackpool will be three-unit stations. All other new pump stations will be two-unit stations.

#### **2.3.2.2 Pump Station Expansions**

Two existing pump stations will be expanded by adding pump units. A third 3,730 kW (5,000 hp) pump unit will be added at Blue River, and a fifth 1,865 kW (2,500 hp) pump unit will be added at Sumas.

#### **2.3.2.3 Pump Unit Replacements**

Four existing pump units at the existing pump stations at Wolf and Blue River are not capable of providing sufficient pumping capacity for Line 2. These four pump units will be replaced to achieve higher flow or lower pressure characteristics, using the same motors, pump bases and piping, if practicable. However, the extent of the infrastructure modifications required, and the complexity of the logistics in keeping the existing pumps operational, might require installation of new pump bases and piping. If this is the case, new pump buildings will be constructed adjacent to the existing pump buildings, and the existing pump buildings will be decommissioned once the new pumps are ready for service. The new pump buildings would use the existing power and control infrastructure.

#### **2.3.2.4 Pump Station Reactivations and Deactivations**

The existing deactivated pump station on Line 1 at Niton has two 1,492 kW (2,000 hp) pump units, which will be reactivated. In addition, the active pump stations located at Albreda, Stump, Hope and Wahleach might be deactivated, if they are not required for reliability.

### 2.3.2.5 Pump Station Configuration

Of the 11 new pump stations, one will be connected to Line 1, and 10 will be connected to Line 2. In addition, two of the existing pump stations (i.e., Wolf and Blue River) that are currently connected to Line 1 will be disconnected and reconnected to Line 2. The pump station at Jasper, which is currently connected to the active 914.4 mm (36 inch) OD segment from Hinton to Hargreaves, will be disconnected and reconnected to the 609.6 mm (24 inch) OD segment from Hinton to Hargreaves. This segment will be reactivated to form part of Line 1.

Table 2-2 summarizes the planned changes to pump stations and units.

**Table 2-2: Planned Changes to Pump Stations and Units**

Location	Pump Stations			Pump Units			Unit Size		Line No.
	New	Expanded	Reactivated	New	Reconfigured <sup>1</sup>	Reactivated	kW	hp	
<b>Existing Pump Station Sites</b>									
Edmonton, AB	1	–	–	5	–	–	3,730	5,000	2
Gainford, AB	1	–	–	3	–	–	3,730	5,000	2
Niton, AB	–	–	1	–	–	2	1,492	2,000	1
Wolf, AB	–	–	–	–	2	–	3,730	5,000	2
Edson, AB	1	–	–	3	–	–	3,730	5,000	2
Hinton, AB	1	–	–	3	–	–	1,865	2,500	2
Jasper, AB	–	–	–	–	2	–	1,865	2,500	1
Rearguard, BC	1	–	–	2	–	–	3,730	5,000	2
Blue River, BC	–	1	–	1	2	–	3,730	5,000	2
Blackpool, BC	1	–	–	3	–	–	3,730	5,000	2
Kamloops, BC	1	–	–	4	–	–	3,730	5,000	2
Kingsvale, BC	1	–	–	2	–	–	3,730	5,000	2
Sumas, BC	1	–	–	2	–	–	3,730	5,000	2
	–	1	–	1	–	–	1,865	2,500	Puget
<b>New Common Pump Station Site</b>									
Black Pines, BC	1	–	–	2	–	–	1,865	2,500	1
	1	–	–	2	–	–	3,730	5,000	2
<b>Total</b>	<b>11</b>	<b>2</b>	<b>1</b>	<b>33</b>	<b>6</b>	<b>2</b>			
<b>Aggregate Total</b>	<b>14</b>			<b>41</b>					
Note:									
1. For higher flow/lower pressure, to enable the existing motors to be used.									

Where new pump stations are to be constructed adjacent to existing pump stations that will remain operational, the only components that will be shared are utility power and non-operating site infrastructure (i.e., access roads, fencing, drainage systems, offices, workshops, washrooms). This is to ensure that a failure in equipment providing service to one pipeline does not adversely affect the other pipeline. Design considerations will address overall system independence and reliability.

### 2.3.2.6 Pump Station Infrastructure

The new pump stations will be similar to the existing pump station at Chappel (see Figure 2-2). Each new pump station will include the following components contained within a fenced and gravelled area:

- an electrical substation
- an electrical services building
- a pump building
- an operator building
- station piping
- at least one variable frequency drive capable of controlling the pump unit



**Figure 2-2: Existing Chappel, BC, Pump Station**

#### 2.3.2.7 Ancillary Facilities and In-line Inspection Tool Traps

Ancillary facilities, including scraper traps and pressure reduction or relief stations, and any required containment, might be required at one or more locations. Scraper traps are used to send and receive in-line inspection (ILI) tools and scraper tools. The scraper traps segment the pipeline to facilitate ILI and maintenance pigging. Pressure reduction and relief stations are used to provide overpressure protection. A hydraulic surge study, including hydraulic analysis and pipeline profile, will be completed to determine the number and locations of these facilities.

In total, nine new sending traps will be required at the following pump stations:

- Edmonton (Line 2)
- Edson (Line 2)
- Hinton (Line 1)
- Rearguard (Line 1 and Line 2)
- Black Pines (Line 1 and Line 2)
- Kamloops (Line 2)
- Burnaby (Westridge delivery line)

Nine new traps for receiving ILI tools will be required at the following pump stations:

- Edson (Line 2)
- Rearguard (Line 1 and Line 2)
- Darfield (Line 2)
- Black Pines (Line 1 and Line 2)
- Kamloops (Line 2)
- Burnaby (Line 2)
- Westridge (Westridge delivery line)

Existing sending traps will remain in service at the following pump stations:

- Edmonton (Line 1)
- Edson (Line 1)

- Darfield (Line 2)
- Kamloops (Line 1)
- Sumas (Line 1 and tank lines)

Existing sending traps on Line 1 will be deactivated and removed at the Hinton pump station.

Existing receiving traps on Line 1 will remain in service at the following pump stations:

- Edson
- Hinton
- Kamloops
- Sumas
- Burnaby

The existing receiving trap on Line 1 at the Darfield pump station will be deactivated and removed. The existing trap facility at the Hargreaves pump station, which does not have operational traps normally installed, will also be deactivated and removed.

Table 2-3 lists the run distances between sending and receiving traps, once the pipelines and traps have been constructed and configured.

**Table 2-3: Run Distances between Sending and Receiving ILI Traps**

Pipeline Segment	Pipeline OD (mm)	Run Distance (km)
<b>Line 1</b>		
Edmonton to Edson, AB *	609.6	229
Edson to Hinton, AB	762.0	89
Hinton, AB, to Rearguard, BC	609.6	159
Rearguard to Black Pines, BC	609.6	308
Black Pines to Kamloops, BC	762.0	38
Kamloops to Sumas, BC	609.6	259
Sumas to Burnaby, BC	609.6	65
<b>Line 2</b>		
Edmonton to Edson, AB *	914.4	247
Edson, AB, to Rearguard, BC	914.4	251
Rearguard to Darfield, BC	914.4	271
Darfield to Black Pines, BC	762.0	43
Black Pines to Kamloops, BC	914.4	39
Kamloops to Burnaby, BC	914.4	329
Note *: The Edmonton to Edson, AB, run distances are unequal between the two pipelines primarily because of alternative routing for Line 2 through the Edmonton Transportation And Utility Corridor.		

### 2.3.3 Tanks

As shown in Figure 2-3, the TMPL system has terminals located at:

- Edmonton
- Kamloops
- Sumas
- Burnaby

These terminals include tanks, meters, pumps, buildings and ancillary facilities. Collectively, the TMPL system has 40 tanks with a combined total shell capacity of 840,200 m<sup>3</sup> (5,284,700 bbl).



**Figure 2-3: Burnaby Terminal**

A preliminary assessment indicates that, to accommodate the expanded pipeline operation, the project will require 21 new tanks. The new tanks will range in shell capacity from 27,820 m<sup>3</sup> (175,000 bbl) to 63,590 m<sup>3</sup> (400,000 bbl). Further study is underway to verify the optimal number and capacities of the new tanks. It is expected that the new tanks will be constructed within the existing terminal fence lines, requiring no additional land. The location, number and capacity of the new tanks are shown in Table 2-4.

**Table 2-4: New Tanks**

Terminal	No. of Tanks	Tank Size (Nominal or Shell Volume)						
		m <sup>3</sup>	27,820	34,980	39,750	43,720	51,670	63,590
		bbl	175,000	220,000	250,000	275,000	325,000	400,000
Edmonton, AB	6	–	–	2	2	–	–	2
Sumas, BC	1	–	1		–	–	–	
Burnaby, BC	14	–	–		2	10	2	
<b>Total</b>	<b>21</b>	–	<b>1</b>	<b>2</b>	<b>4</b>	<b>10</b>	<b>2</b>	<b>2</b>

All tanks will be designed and constructed in accordance with the American Petroleum Institute (API) Standard 650, Welded Steel Tanks for Oil Storage, with foundations designed based on site-specific geotechnical conditions. Secondary containment will be provided in accordance with National Fire Protection Association (NFPA) Standard 30 and federal or provincial fire codes, as applicable. Each tank will be equipped with a radar gauging system for liquid overflow protection. Fire suppression equipment and capacity will be in accordance with the NFPA Standard 30 and federal or provincial fire codes, as applicable. Additional air monitoring units will be installed, as required. The existing tanks, new project tanks and total tank capacity by location are shown in Table 2-5.

**Table 2-5: Existing and New Tank Capacities**

Terminal	Existing		New		Total	
	Number of Tanks	Total Capacity (m <sup>3</sup> )	Number of Tanks	Total Capacity (m <sup>3</sup> )	Number of Tanks	Capacity (m <sup>3</sup> )
Edmonton, AB	19 <sup>1</sup>	430,400	6	276,300	25	707,030
Kamloops, BC	2	25,600	0	0	2	25,600
Sumas, BC	6	113,800	1	27,822	7	141,622
Burnaby, BC	13	270,400	14	620,032	26 <sup>2</sup>	890,432
<b>Total</b>	<b>40</b>	<b>840,200</b>	<b>21</b>	<b>924,154</b>	<b>60</b>	<b>1,764,684</b>
<b>Total Increase in Capacity</b>						<b>110%</b>
Note:						
1. Before completion of the Edmonton Terminal Expansion Project.						
2. It is expected that one 12,700 m <sup>3</sup> tank will be replaced with one 43,700 m <sup>3</sup> tank.						

### 2.3.4 Westridge Marine Terminal

The Westridge Marine Terminal is located on the south shore of Burrard Inlet, east of the Second Narrows in the City of Burnaby, within the jurisdiction of the Port Metro Vancouver (PMV). The Westridge Marine Terminal is used for:

- loading synthetic or crude oil onto Aframax or Panamax class tankers and barges
- off-loading jet fuel from tankers and barges

Jet fuel received at the terminal is delivered to Vancouver International Airport by Trans Mountain’s affiliate, Trans Mountain (Jet Fuel) Inc. In addition to the dock, the Westridge Marine Terminal also has three tanks, containing a total volume of 45,950 m<sup>3</sup> (289,000 bbl), currently being used for staging jet fuel.

The PMV manages vessel traffic in accordance with its *Harbour Operations Manual* available at:

<http://www.portmetrovancover.com/en/users/marineoperations/navigation.aspx>

The immersed depth (i.e., draft) of loaded vessels transiting the Second Narrows is limited to 13.5 m, under the current operating rules. Furthermore, the PMV’s *Harbour Operations Manual* also limits laden tanker transits to near slack water during daylight hours, and requires a minimum of 10% under-keel clearance over a channel width of 2.85 times the beam of the vessel. The requirement to maintain under-keel clearance at the edges of the channel (channel width) is typically the limiting factor in determining the allowable draft of the vessel. An assessment of available tidal windows over the 19-year tidal cycle shows that a draft of 11.75 m on a 44 m beam Aframax tanker is sufficient to ensure sustainable take-away capacity from the Westridge Marine Terminal. For a 44 m beam Aframax tanker, the 11.75 m draft corresponds to a heavy oil capacity of 87,400 m<sup>3</sup> (550,000 bbl) and a light oil capacity of about 92,200 m<sup>3</sup> (580,000 bbl). These capacities have been used to determine the post-expansion estimate of 34 Aframax tanker loadings per month. Depending on the available tides, the actual draft of laden tankers will be up to 13.5 m.

While loadings at the Westridge Marine Terminal fluctuate based on market conditions, currently five tankers and three barges are typically handled each month (i.e., two barges outbound with crude oil shipments and one inbound with jet fuel). It is expected that this will increase up to the equivalent of 34 partially loaded Aframax tankers (with an 11.75 m draft) and three barges, an increase of about 30 vessels per month. Crude oil and jet fuel barge traffic is not expected to increase because of the project. Jet fuel receipts will not change because of the project.

Vessels bound for the Westridge Marine Terminal currently account for about 3% of the total traffic in the PMV's jurisdiction. Because of the expanded TMPL system, vessel movement and loading facilities are expected to account for 14% of the total traffic in the PMV based on current activity, which represents an increase of about 11% over current traffic levels.

Preliminary design of the additional facilities at the Westridge Marine Terminal is currently underway. These plans include constructing two new docks:

- one dock with two berths for Aframax and Panamax tankers and oil barges
- one dock with one operational berth for Panamax tankers and barges (oil and jet fuel)

In addition, the plans include construction of a utility dock with multiple berths for pilot launches, tugs, spill response vessels and equipment.

The dock facilities at the Westridge Marine Terminal were constructed in 1957 and will require significant upgrades or reconstruction before 2020. If cost-effective upgrading can be done to the existing dock while it is operational, this will replace the need for a single berth face dock. Otherwise, the existing dock will be removed and replaced.

The exact configuration of the new docks has yet to be determined, and depending on their location some nearshore dredging might be necessary to accommodate construction of the new docks.

The Westridge Marine Terminal docks will be equipped with:

- fender and mooring structures
- vessel access towers
- delivery and receipt pipeline systems
- loading and unloading arms
- vapour recovery systems and fire-suppression systems, similar to those that currently exist at the terminal

Additional tanker support systems that are being considered include refuelling from barges and using shore power to limit generator use. Currently, only 5% of the international tanker fleet is equipped to take shore power, so it might not be feasible to enforce the use of shore power at this time.

Figure 2-4 is a historical photo of the Westridge Marine Terminal. Figure 2-5 is a current photo of the Westridge Marine Terminal.



**Figure 2-4: Westridge Marine Terminal – Historical**



**Figure 2-5: Westridge Marine Terminal – Current**

## **2.4 Project Execution**

### **2.4.1 Project Schedule**

The process to establish commercial support for the project began in 2011 and continued through to November 2012. This process defined the size of the project based on 15- and 20-year contractual commitments of 112,480 m<sup>3</sup>/d (707,500 bbl/d) made by Trans Mountain's shippers.

For the project, Trans Mountain has initiated contact with landowners, engagement with Aboriginal peoples, public consultation and discussion with communities, and communications with regulatory authorities, which will continue through the post-construction phase of the project. As described further in Sections 4.0, Aboriginal Engagement and Section 5.0, Public Consultation, one of the objectives of the Aboriginal engagement and public consultation programs is to determine a project corridor that closely parallels the existing system, while incorporating the input, interests and concerns of landowners, Aboriginal peoples, communities, stakeholders and regulatory authorities.

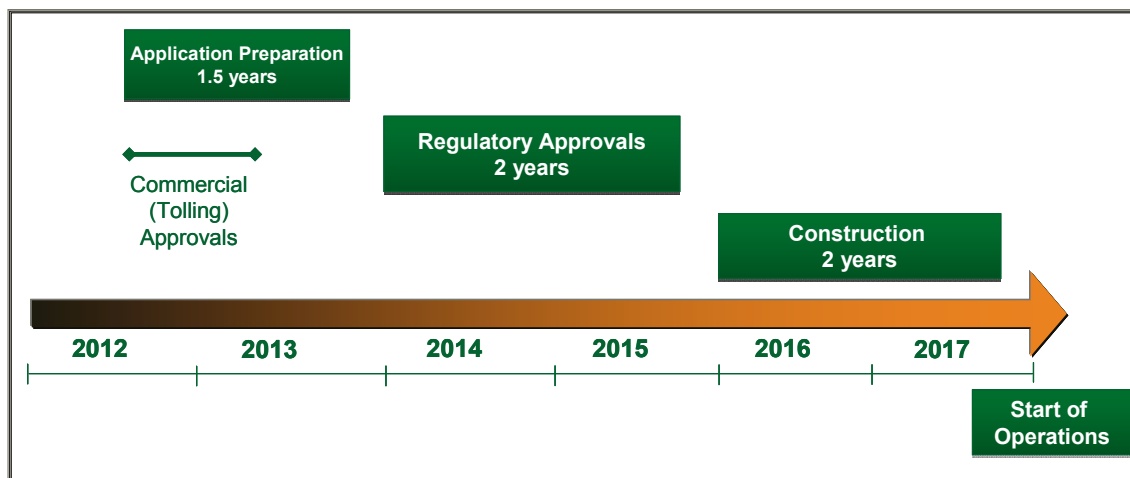
As these consultation activities continue, Trans Mountain will gain important information that will affect the detailed engineering of the project and assist in preparing the NEB application. Preliminary engineering for the project began in early 2012 based on expected contractual commitments. Detailed engineering will continue through to early 2016.

The ESA process also began in early 2012 with the collection of baseline data and the establishment of supporting studies. As part of the ESA, Trans Mountain will continue to meet with, and gather information from, landowners, Aboriginal peoples, communities and stakeholders on questions and concerns. These issues and concerns will assist Trans Mountain in identifying topics to include in the ESA. Issue identification and environmental and socio-economic studies will continue through to late 2013, and the results will form part of the NEB application. Some environmental and socio-economic studies are expected to continue through to construction and operations to support project execution.

In late 2013, Trans Mountain plans to file an application, under Section 52 of the NEB Act, for a certificate to construct and operate the project. Trans Mountain expects that the regulatory review process for this project could extend up to two years from the application submission date.



If the NEB grants a certificate for the project by late 2015, construction activities would be scheduled to start as early as possible in 2016 and end by fall 2017. The expanded TMPL system could start service in December 2017. This scheduling information is based on a conceptual design and might change, or be refined, based on a variety of factors, including field data collection, the regulatory review process and the results of consultation and engagement programs. Figure 2-6 shows the conceptual project schedule.



**Figure 2-6: Conceptual Project Schedule**

## 2.4.2 Project Activities

Various activities will be conducted to successfully execute the project, including:

- planning and engineering
- site preparation
- construction
- cleanup and reclamation

### 2.4.2.1 Planning and Engineering

Project planning and engineering design activities will be completed as part of the regulatory application process. Input from Aboriginal peoples, regulatory authorities and stakeholders will be assessed and incorporated into project plans. The objectives of planning and engineering are to meet the NEB's requirements for the project and have the necessary information in place to ensure that all phases (from site preparation to decommissioning and abandonment) of the project are implemented in a socially and environmentally responsible manner.

Routing analysis and determination are currently underway as part of preliminary engineering design for the project. The primary design objective is to construct the project within the existing pipeline right-of-way, and where this is not possible, minimize any new linear disturbance. The project corridor will be selected to minimize impacts on the environment, maximize worker and public safety, and minimize other social impacts. As such, portions of the new pipeline segments might be located outside of the existing pipeline right-of-way. Routing considerations include minimizing, where practicable, effects on:

- local residents
- soil and soil productivity
- water quality and quantity
- air quality and the acoustic environment
- fish and fish habitat
- watercourses
- wetlands
- vegetation

- wildlife and wildlife habitat
- species at risk or species of concern
- heritage and archaeological resources
- Aboriginal traditional and contemporary land use

Although routing of the pipeline segments will closely follow the existing alignment of the TMPL system, route refinements will be considered based on:

- improvements to the environmental footprint. For example, selection of appropriate routing to avoid or minimize the number of watercourse crossings (i.e., rivers or streams) or disturbance to wetlands and environmentally sensitive areas.
- avoidance of culturally sensitive areas
- avoidance of effects on Aboriginal peoples and urban residents, where practicable
- opportunities for improved constructability
- safety and operability

Trans Mountain will endeavour to minimize new disturbance taking into consideration safety, the environment and stakeholder feedback.

#### 2.4.2.2 *Site Preparation*

Site preparation activities will include:

- surveying the boundaries of the pipeline right-of-way (e.g., line-of-sight clearing with chain saws, flagging and staking)
- clearing, timber salvage and slash disposal
- grading and pipeline right-of-way preparation
- constructing the pipeline right-of-way, temporary workspace and facility sites
- marking the trench line and existing utilities
- fencing and flagging avoidance areas, such as protected wildlife habitat, rare plant communities, archaeological sites or Aboriginal cultural sites

Snow, trees, stumps, brush and other vegetation will be cleared from the construction right-of-way, temporary work sites and permanent facilities that are not located on existing, previously cleared easements. Timber and brush disposal options will be subject to agreements with landowners and appropriate government authorities. Equipment used during clearing activities will include:

- chainsaws
- feller-bunchers or other tree-clearing equipment
- log skidders
- mowers
- bulldozers
- backhoes

Where present in non-forested areas, topsoil or strippings will be salvaged to ensure that soil productivity is maintained. The width and depth of topsoil or strippings salvage will depend on the land use, soil conditions, microtopography, regulatory agency requests and grading requirements. Any salvaged topsoil or strippings will be segregated and stockpiled along the construction right-of-way, and at facility sites in low-profile berms or in piles adjacent to the site perimeter. Equipment used during topsoil or strippings handling activities will include bulldozers, graders and backhoes.

Following topsoil or strippings salvage, grading will be conducted on irregular ground surfaces, including temporary workspaces, to provide a safe work surface. Graders, backhoes and bulldozers will be used for this activity. Blasting will be required where hard bedrock is encountered.

### 2.4.2.3 Construction Activities

#### **Pipeline**

Construction of the pipeline will be completed in construction spreads. Segmentation of the pipeline construction will divide the work into manageable portions based on length and expected construction challenges. The work schedule will alternate between winter and summer construction periods, based on regional conditions, and will provide for a continuous construction schedule. It is expected that construction will take place in four or five pipeline construction spreads in each of the three construction seasons (two in summer and one in winter) for a total of 15 spreads. Each construction spread is expected to range from 30 to 100 km in length. The number of construction spreads might change based on more detailed engineering and environmental studies and construction planning.

Large mainline work crews will construct most of the pipeline within each construction spread. Smaller specialty work crews will work in parallel with the mainline work crews to complete construction of non-standard pipeline sections at road, rail, utility and watercourse crossings, for example. To ensure safe pipeline and facilities installation, specialty contractors will also be used for construction in urban or industrial areas to ensure safe pipeline and facilities installation.

From the point of manufacture, the pipe might be transported by ship or by rail to temporary stockpile sites along the construction corridor. From the temporary stockpile sites, the pipe will be transported by truck to the construction right-of-way. The pipe will then be bent, lined up, welded, joint-coated and inspected before being lowered into the trench. Inspection activities will involve using high-voltage methods (such as using a jeep meter) to check the coating for any defects, and X-ray or ultrasonic examinations of all welds.

The trench will be excavated using tracked excavators to a depth sufficient to ensure that the depth of cover meets or exceeds applicable codes. The minimum depth of cover will be about 0.8 m, with appropriate variances depending on land use. Primary road and railway crossings will be bored to minimize interference with existing activities and usage.

Sideboom tractors will lower the pipe into the trench. Trench dewatering might be necessary at certain locations during lowering in (e.g., to ensure acceptable bedding for the pipe, to prevent the pipe from floating or for performing tie-in welds).

Before backfilling, subsurface erosion control structures, such as trench breakers, will be installed on steep slopes along with subdrains, where required, to manage springs. The trench will be backfilled using backhoes, graders, bulldozers or specialized backfilling equipment. Generally, backfill material will consist of native trench spoil material.

Hydrostatic testing (i.e., pressure testing using water) will be used to verify the pipeline integrity after welding is complete. At major watercourse crossings, pipe sections will be pretested before installation. Water will be drawn from suitable sources and returned to the appropriate watersheds in accordance with permit requirements. To minimize the total amount of water withdrawn for test purposes, where practicable, water will be moved along the pipeline segments for reuse in multiple tests. Upon successful test completion, the test sections will be dewatered using pigs (foam or rubber sealing plugs) propelled through the pipeline by compressed air. Testing programs will be subject to NEB approval. Appropriate designs and construction practices will be implemented to meet technical standards and protect the safety of workers and the public.

New pipeline segments will cross numerous wetlands, unnamed watercourses and major watercourses, such as the North Saskatchewan, Pembina, McLeod, Fraser, Raft, Clearwater, North Thompson, Thompson and Vedder rivers. Pipe installations at watercourse crossings can be classified as either wet

(trenched) or dry (trenched with water flow control or trenchless) crossings. With a wet crossing (e.g., open cut), the trench can be excavated through flowing water, if present. With a dry crossing where a trench is necessary, excavation normally occurs through the streambed once the water flow has been isolated, either by a dam and pump-around mechanism, or by using a flume over the excavated trench. Horizontal directional drill techniques could also be used for watercourse crossings, where feasible. Crossing methods specific to each watercourse will be determined in consultation with engineering and environmental specialists, as well as applicable regulatory authorities.

Above-ground facilities, such as scraper traps (to allow for pigging of the pipeline) and MLBVs will be installed at strategic locations along the pipeline. All-season access roads and power lines to the facilities will be established and the installations will be fenced.

### **Pump Stations**

For the new pump stations on existing or new sites, the area will be surveyed, cleared of vegetation, and topsoil or strippings salvaged, segregated and stockpiled. Once the sites are graded for new pump stations, the foundation piles will be driven or drilled using pile drivers or augers, and buildings will be installed on the foundation piles. The electrical and pipeline connections will be completed once the buildings have been installed. Gravel will be placed over high-traffic areas. Following construction, all systems and processes will be connected and tested. Equipment used during these activities could include cranes and trucks.

In addition, constructing the new pump station sites at Black Pines will require installing a power line, substation and permanent access roads. Constructing the power line will include:

- clearing and preparing the right-of-way
- erecting power poles
- stringing wire
- cleaning up and restoring work areas

Constructing access roads will require site grading, placing gravel, where necessary, and installing culverts at road ditches.

### **Tanks**

Once site preparation activities are complete and foundations are constructed, the new tanks will be assembled and installed at the Edmonton, Sumas and Burnaby terminals. Secondary containment, consisting of compacted clay or a geo-synthetic liner, will be constructed under and around the tanks. All necessary fire suppression and vapour control equipment will be installed. A combination of gravel and asphalt surfaces will be placed over high-traffic areas of the terminals, and fencing will be maintained around the sites. Following construction, all systems and processes will be connected and tested.

### **Westridge Marine Terminal**

Expansion of the Westridge Marine Terminal might require dredging.

Piles will be driven to support the new dock structures. Once the docks are built, berthing and mooring structures will be constructed. In addition, topside equipment will be installed, such as piping systems, loading arms, vapour control systems and fire protection systems. The number of piles and other structures will depend on the results of ongoing planning and engineering. Marine construction equipment likely required for expansion activities will include:

- barges
- dredging equipment
- pile drivers
- cranes

## **Temporary Facilities**

Temporary facilities required for the project are expected to include:

- material stockpile and staging areas (e.g., pipe stockpile sites)
- off-load areas
- construction work camps
- construction office sites
- temporary access roads
- borrow pits
- equipment storage sites

Installation of facilities will include building temporary accommodation for construction workers, establishing site construction offices and installing electrical services and lighting. Depending on the intended site's use, gravel and fencing will be installed, as required.

### **2.4.2.4 Cleanup and Interim Reclamation**

Appropriate mitigation (e.g., soil handling, erosion control) and monitoring activities will be implemented during construction to maximize reclamation success. Project-generated garbage or debris will be removed regularly from along the construction right-of-way and facility sites. Waste will be disposed of in accordance with applicable regulations.

After the pipeline trench has been backfilled, and once weather and soil conditions permit, cleanup and reclamation activities will start along the disturbed portions of the pipeline right-of-way. This will be done using bulldozers, backhoes, graders and farm equipment, where required. The topsoil or strippings will be replaced, and cross ditches and diversion berms will be installed on moderate and steep slopes to reduce the risk of erosion. In forested areas where erosion is not expected, natural revegetation or seeding using a native seed mix will be the preferred methods of reclamation. In agricultural areas, an appropriate seed mix will be planted in consultation with the landowner and regulatory authority. Restoration and monitoring activities typically extend for a number of years following construction to ensure that areas disturbed during construction are satisfactorily restored.

Reclamation of the facility sites will start once the building activities have been completed. Facility site contours and surface drainage will be returned to a stable and maintenance-free condition. The topsoil or strippings will be returned to non-use areas and seeded with an appropriate seed mix. Remaining strippings or topsoil storage berms will be seeded with an appropriate seed mix pending future use and will be monitored to ensure that any erosion problems are addressed. At new facility sites, a gravel surface will be placed over high-traffic areas of the site and fencing will be erected to enclose the site.

As required, additional reclamation measures will be applied to the following to return these disturbed areas to a stable and maintenance-free condition:

- banks at watercourse crossings
- the construction right-of-way
- temporary workspaces
- temporary access routes
- facility sites

### **2.4.3 Pipeline Operation and Maintenance**

Once the project has been commissioned, it will be fully integrated into the existing TMPL system operation. The elements that are central to the operation and maintenance of the TMPL system include:

- an environment, health and safety (EHS) policy

- an integrity management programs (IMPs) that includes risk assessments, corrosion control, inspection and preventative maintenance, hydrostatic testing and damage prevention
- an emergency preparedness and response program that includes an Emergency Response Plan (ERP) and spill response resources for spills on land and water (e.g., at the Westridge Marine Terminal)

The TMPL system is remotely controlled and monitored from a control centre located at the Edmonton Terminal using a supervisory control and data acquisition (SCADA) system. The SCADA system provides continuous operating information to control centre operators who are responsible for operating the TMPL system. The SCADA system contains a real-time transient leak detection system that monitors flow metering and other instrumentation across the pipeline. This information provides input to a hydraulic model that simulates pipeline operating conditions and compares the simulated result to the actual operating conditions along the pipeline. Through this analysis, the SCADA system will generate alarms if flow imbalances exceed threshold levels. Control centre operators are responsible for immediately shutting down the pipeline if the SCADA system analysis indicates that a leak might have occurred.

Scheduling of operations and maintenance, and regular aerial and ground patrols are part of the standard operations activities for the TMPL system. Line 1 and Line 2 will be maintained from existing bases at Edmonton, Edson, Jasper, Blue River, Kamloops, Hope and Burnaby.

#### 2.4.3.1 *Environment, Health and Safety Policy*

The engrained philosophy behind all activities on the TMPL system is KMC's EHS policy. The EHS policy is a formalization of KMC's commitment to conducting business in a safe and environmentally responsible manner. The EHS policy states:

*Every employee is expected to share Kinder Morgan's commitment to pursue the goal of not harming people, protecting the environment, using material and energy efficiently and promoting best practices, thereby earning the confidence of customers, security holders and society at large, being a good neighbor and contributing to sustainable development. Kinder Morgan's policy is to comply with all health, safety, security and environmental laws, rules and regulations, not just because it is legally required but also because we believe it is the responsible way to conduct our business. Kinder Morgan has systems in place that prepare for emergencies and procedures that coordinate our response plans with emergency response organizations in the communities where we operate. Kinder Morgan has a systematic approach to health, safety, security and environmental management designed to ensure compliance with the law, to train employees to be aware of and meet their responsibility for protection of health, safety and the environment, and to achieve continuous performance improvement. In addition to the Kinder Morgan commitment, contractors are required and joint ventures under Kinder Morgan's operational control are expected to apply this policy. Employees, supervisors or operational managers who knowingly engage in or condone environmental health or safety violations are subject to disciplinary action including suspension or termination.*

Trans Mountain has in place an environmental management system designed to manage environmental risks and provide assurance of compliance with all applicable laws. Based on the EHS policy, the environmental management system applies to all of Trans Mountain's activities (i.e., project development, planning, construction, operation, maintenance, decommissioning and reclamation of facilities). All Trans Mountain employees, contractors and consultants are responsible for performing their work in a manner consistent with the EHS policy.

### 2.4.3.2 Integrity Management Programs

Trans Mountain's pipeline and facility IMPs use an integrated approach to ensure the long-term functional integrity of its assets used for transporting or storing petroleum products. The IMPs help to coordinate the various integrity-related programs and to identify opportunities for increased economic efficiency in integrity-related initiatives. The main components of the IMPs are hazard identification, prevention and monitoring, and implementing consequence reduction measures.

The philosophy behind the IMPs is that pipeline and facility integrity is not a one-time activity. Rather, it is a continuous and conscious process of monitoring, collecting data, analyzing risk and mitigation that is conducted throughout the life of the pipeline system. New technologies and assessment methods are evaluated and implemented, as appropriate, and the IMPs are adapted to the evolving nature of integrity management.

The objectives of the IMPs are to:

- establish an integrated program, which promotes the long-term integrity of the TMPL system
- contribute to KMC's EHS policy commitment of conducting its business in a safe and environmentally responsible manner
- ensure compliance with applicable regulations and standards

Based on a comprehensive annual risk assessment, the pipeline IMP is continuously improved through monitoring performance measures and the reduction of risk.

The IMPs encompass the following elements:

- risk management
- hazard identification and monitoring
- ILI
- corrosion control
- natural hazards management
- third-party damage prevention
- consequence reduction

#### **Risk Management**

Since the original construction and operation of the TMPL system, Trans Mountain has incorporated risk management practices and risk reduction measures into its operations and maintenance of the pipeline. The risk reduction measures have focused on decreasing the frequency and potential for an incident occurring and the resulting potential consequence. In 2010, the risk management program was formalized in a semi-quantitative pipeline risk assessment model with the objectives of continuous improvement and reduction of risk levels on an annual basis.

#### **Hazard Identification and Monitoring**

To prevent hazards from affecting pipeline and facility integrity, every effort must be made to identify all relevant hazards. Integrity hazards are defined as conditions or situations that could result in the release of products. Hazard identification is considered an ongoing process to identify all potential threats to the safe operation of pipelines and facilities. Through operating experience, accepted industry practice, recommended guidelines and regulatory requirements, programs have been developed to control the risk for each hazard relating to a loss of containment. Both the pipeline and facility hazard listings are available in their respective program documents. The commonly accepted hazards for low-vapour-pressure pipelines are corrosion, cracking, third-party damage, material and construction defects, outside forces and operator error. The following sections summarize the measures used by Trans Mountain to minimize the damage potential of these hazards.

## **In-Line Inspection**

Since 1974, ILIs have been conducted on the TMPL system. The data gathered forms the foundation for the anomaly investigation and pipeline repair programs. The ILI tools commonly used include:

- circumferential magnetic flux leakage (MFL)
- axial MFL
- ultrasonic
- calliper

Depending on the tool selection, the inspection provides an indication of anomalies, such as:

- metal loss (corrosion, gouges, grooves)
- metal addition (weld fill-ins, fittings)
- manufacturing defects (inclusions, laminations)
- weld defects
- cracks and deformations (dents, wrinkles, buckles)

Data obtained through ILI is compiled and analyzed to identify anomalies that require further investigation. In many cases, excavations are required to expose the pipeline at specific locations to inspect and assess an anomaly using industry-recognized standards. An engineering assessment would be conducted to evaluate the defects that have the potential to impair the structural integrity of the pipeline or that do not comply with current Canadian Standards Association (CSA) Z662 standards. These types of defects are then addressed with a permanent repair, such as:

- recoating the pipe
- grinding down the anomaly
- installing a sleeve
- cutting out and replacing a pipe section

From 1964 to 2003, Trans Mountain had a program of periodic hydrostatic retesting to complement the ILI program. With the development of accurate and reliable high-resolution ILI tools, hydrostatic retesting is now only conducted in situations where ILI is not feasible. In accordance with applicable regulations, hydrostatic testing is required before initiating regular service on new pipeline construction.

## **Corrosion Control**

An impressed-current cathodic protection system is used to reduce the potential of external corrosion occurring on the TMPL system. This protection system consists of 79 rectifiers and anode beds that are continuously monitored using remote sensors. Combined with the protection afforded by the coal tar enamel coating on the existing system, the probability for metal loss resulting from external corrosion is substantially reduced. Although an effective pipeline coating, coal tar enamel has been replaced on new pipelines with a high-performance fusion-bond epoxy coating. This new coating system complies with current industry practice and the current CSA Z662-11 standards.

The use of cleaning tools (pigs) is a preventive maintenance practice to help mitigate internal corrosion by cleaning deposits from the internal surface of the pipe, such as paraffins, asphaltenes, scale and free water. In general, cleaning pigs are run monthly on mainline sections of the TMPL.

## **Natural Hazards Management**

Trans Mountain uses its natural hazards management program to monitor and protect against damage to the pipeline from unstable slopes, stream crossings and seismic events. Established in 1998, this program uses a custom database to document inspections and preventive maintenance work at more than 600 sites along the pipeline right-of-way and to schedule future inspection frequency based on risk.



Ongoing ground maintenance includes clearing vegetation along the pipeline right-of-way to ensure visibility during aerial inspection. Aerial inspections are used to monitor for potential water erosion and exposure of the pipeline in areas where streams cross the pipeline right-of-way. Trans Mountain employees and contractors will be dispatched to investigate and correct any issues, if required. Corrective actions might include armouring a streambed against erosion with natural materials, including large boulders and rock substrate, commonly referred to as rip-rap.

### **Third-Party Damage Prevention**

Risks associated with third-party damage to the pipeline are mitigated through a combination of surveillance activities, notification requirements for work along the right-of-way, and a public education program focused on educating landowners, communities and contractors about the presence of the pipeline, and how to work and operate safely around the pipeline. Routine air and ground patrols are conducted to monitor for unauthorized encroachment activities and other integrity threats. Pipeline maintenance personnel are also trained to look for these conditions while executing their regular job duties.

Trans Mountain is a member of Alberta One Call and British Columbia One Call agencies. These agencies serve as a clearinghouse for notifications of any ground disturbances near or across any underground utilities that are registered with them. Through a single telephone number in each province, Trans Mountain is notified of the location and timing of a proposed activity and provided with a contact name. If affected, Trans Mountain will dispatch a technician to identify the pipeline's location and monitor the activities related to the ground disturbance or crossing to ensure that the pipeline is not adversely affected.

### **Consequence Reduction**

In the event of a release, and in addition to prevention measures, steps will be taken to minimize the consequences of a release by quickly shutting down and isolating the damaged section of the pipeline or facility. Trans Mountain has developed comprehensive emergency response procedures that control centre and local operators must follow. Every employee has the authority to order a pipeline shutdown, but the pipeline can only be restarted following a strict protocol with sign-off from senior management. These procedures, together with aerial and ground patrols, calls from the public to Trans Mountain's toll-free emergency number, and continuous SCADA monitoring and leak detection, combine to form the first line of defence in reducing the consequences of a spill.

The SCADA and leak detection systems continuously monitor the pipeline for changes in operating parameters that would indicate a possible leak. The SCADA system monitors the pipeline flow rate, pressure, temperature and density of product, among other things. These parameters are then compared to a theoretical flow model and any differences outside of prescribed norms that might indicate a problem are identified. If a variance is found, an alarm will sound that is received by a control centre operator. All operators undergo rigorous training, including simulator testing, to qualify for critical operations positions. Operators may not operate unsupervised until they have passed all testing and are fully qualified.

#### **2.4.3.3 *Emergency Preparedness and Response Program***

Trans Mountain has in place a comprehensive emergency preparedness and response program in accordance with the EHS policy and Section 32 of the NEB *Onshore Pipeline Regulations, 1999*. The emergency preparedness and response program consists of:

- an ERP
- a response management system
- training and spill response exercises
- spill response resources for the pipeline and for the Westridge Marine Terminal

## **Emergency Response Plan**

Trans Mountain maintains a geographically based ERP that includes:

- information pertaining to notification requirements
- emergency checklists and contacts
- response team organization
- facilities and pipeline information
- material safety data sheets
- health and safety plans
- route maps depicting control points and environmentally sensitive areas

The ERP, including field guides containing route maps and critical initial response procedures, has been provided to key field operations and maintenance personnel. A project-specific ERP will be prepared for construction and commissioning activities. The existing operations ERP will be revised to reflect the response requirements of the expanded system in advance of starting operations.

## **Response Management System**

Since 1990, Trans Mountain has been delivering its community awareness and emergency response program to emergency services organizations and government agencies along the TMPL system corridor. The objectives of the program are to familiarize first responders with the pipeline location, explain the properties of the pipeline's contents, and promote information exchange and coordination of response efforts in the event of an incident. As part of the response management system, Trans Mountain staff are trained in the emergency response procedures and conduct regular emergency exercises, some of which include local first responders. Trans Mountain also has standing agreements for contract resources to provide response equipment and labour, air and human health monitoring, environmental assessment and emergency management.

Trans Mountain has adopted the incident command system (ICS) as the basic response structure for its emergency response teams. The ICS, developed in the US almost 30 years ago, is now the system preferred by emergency response organizations around the world to handle a wide variety of emergency situations, including oil spills.

## **Training and Spill Response Exercises**

Emergency response training is provided to head office and field personnel to promote readiness in the event of a spill. The training includes classroom instruction on the ICS, with general knowledge of the system and procedures, and more specific training for individuals with specific roles in the event of an emergency. Regularly scheduled ICS training is used to ensure that Trans Mountain employees, government personnel and first responders (e.g., local fire departments and police detachments) are trained to fulfill the key ICS roles. A combination of tabletop and field deployment exercises are used to simulate an emergency and to ensure that employees are fully trained in activation of the emergency response plans and are familiar with the deployment and capability of the equipment used. Trans Mountain will revise its ICS for the expanded operation before the start of pipeline commissioning.

## **Spill Response Resources**

### *Pipeline*

Trans Mountain owns, maintains and operates dedicated spill response equipment at strategic points along the TMPL system corridor.

Oil spill containment and recovery (OSCAR) units are located at Trans Mountain's facilities in Alberta (Edmonton and Jasper) and British Columbia (Blue River, Kamloops, Hope and Burnaby). Each OSCAR unit contains about 300 m of oil recovery boom and support equipment, including a river jet boat for deployment. All equipment is helicopter transportable for delivery to remote locations not accessible by road. A separate OSCAR unit containing 1,524 m of river boom is also located at the Kamloops Terminal. Specialized equipment has been developed in-house by Trans Mountain employees for

intercepting and recovering oil, if required, from beneath the ice on frozen rivers and lakes. This equipment is stored in the Jasper and Edmonton OSCAR units.

### ***Westridge Marine Terminal***

If an incident occurs at the Westridge Marine Terminal, the presence of the Trans Mountain loading master on board the vessel ensures an immediate coordinated response. The loading master has command experience and remains on board the tanker throughout the loading operation to monitor the performance of the vessel and its crew and to ensure effective communication between the terminal staff and the vessel's officers and crew.

Once a vessel is secured alongside the dock it is encircled by a containment boom. This is as a precautionary measure to confine potential spills to the immediate area of the terminal and to facilitate rapid response and recovery. Trans Mountain also maintains a secondary boom and a boat at the terminal for immediate deployment in the event of an incident.

In addition to its own equipment, and as required by the *Canada Shipping Act*, Trans Mountain is a member of Western Canada Marine Response Corporation (WCMRC) and is contracted with them to provide spill response services. The WCMRC is the Transport Canada certified marine spill response organization that serves the West Coast. To ensure it can meet the requirements set out by Transport Canada, the WCMRC maintains caches of spill response equipment. Their main operating base is located in Burnaby, near the Westridge Marine Terminal, and they maintain several response vessels on the water in Vancouver Harbour to ensure a prompt response, including a skimming vessel kept at the Westridge Marine Terminal.

Trans Mountain maintains an Emergency Preparedness and Response Plan for the Westridge Marine Terminal that would be used to manage the response to a spill. This plan will be evaluated for its suitability to the expanded operation and will be revised as necessary to ensure the safety of people and the environment. This plan forms the basis for regular emergency response training and exercises that are conducted with terminal staff and other agencies.

Trans Mountain works closely with the PMV, Transport Canada, the Pacific Pilotage Authority (PPA) and other agencies to ensure the safety and efficiency of vessels calling at the Westridge Marine Terminal. In 1976, Trans Mountain was a founding member of the spill response cooperative that has become the WCMRC, and continues to be a part owner of the organization.

#### **2.4.4 Westridge Marine Terminal Operation**

All vessels visiting the Westridge Marine Terminal are vetted by KMC to ensure they meet Trans Mountain's vessel quality criteria. In addition to Trans Mountain's own vessel screening and inspection program, tankers docking at the Westridge Marine Terminal will meet all applicable local and international rules and regulations, and will be inspected by Transport Canada for compliance. The PMV manages vessel traffic within the harbour in accordance with their *Harbour Operations Manual*. The Canadian Coast Guard (CCG) (a Special Operating Agency of the Department of Fisheries and Oceans Canada [DFO]) monitors vessel movements within Canadian waters, including PPA mandated areas. The PPA ensures safe conduct of vessels in mandated pilotage areas, which includes the shipping corridor between Westridge and Vancouver Island. Where designated vessel traffic lanes exist, the vessels will normally follow those lanes.

In addition to inspections conducted by Transport Canada and other agencies, Trans Mountain conducts a physical inspection of each vessel before it is allowed to berth at the Westridge Marine Terminal. At the Westridge Marine Terminal, all vessel screening and loading operations have been and will continue to be supervised by Trans Mountain's loading master, who has tanker command experience and is on board during all vessel loadings. The loading master's key responsibilities are:

- screening, inspection and acceptance of tankers
- continuously monitoring the condition of each vessel, and its crew, while berthed at the terminal
- supervising loading operations to ensure safety and conduct, in accordance with Trans Mountain's procedures and applicable regulations
- taking actions necessary to ensure the safety and protection of the environment, including refusal to berth, interrupting loading or casting-off of the vessel
- monitoring the performance of the ship and its crew and to ensure effective communication between terminal staff and the vessel's officers and crew

#### **2.4.5 Abandonment**

The existing TMPL system has been successfully operating for almost 60 years through proactive maintenance and integrity programs. At the end of the pipeline system's useful or economic life, the system will be abandoned in accordance with the legislation and regulations in place at that time. At the time of abandonment, Trans Mountain expects that all above-ground equipment and structures will be removed and the sites reclaimed to an appropriate land use. Generally, reclamation activities are expected to include:

- conducting assessments to identify and remediate any potential soil contamination on project lands
- recontouring the facility sites and pipeline right-of-way
- removing drainage structures (e.g., culverts)
- replacing stored subsoil, topsoil and strippings windrows
- decompacting the soil
- allowing either natural revegetation or seeding with an appropriate seed mix, depending on land use of the surrounding area and recommendations by the appropriate regulatory authorities

For the buried pipeline, one of the following two scenarios might occur at the time of abandonment:

- abandonment-in-place
- a combination of abandonment-in-place and pipeline removal

These methods would be considered in light of conditions and regulatory requirements relevant at the time of abandonment. The physical activities associated with pipeline abandonment are expected to include:

- purging and cleaning pipeline contents with nitrogen-propelled pigs
- physically separating the pipeline from any in-service pipeline as well as cutting, capping and sealing it below grade
- reclaiming any land disturbed as a result of physical activities

If the TMPL system permanently ceases operations at some point in the future, Trans Mountain will file an application with the NEB. Abandonment will be conducted in accordance with the legislation and requirements in place at the time of the application.

A Preliminary Abandonment Plan will be developed for the project in accordance with the NEB's *Filing Manual* requirements and will form a part of the Section 52 application to the NEB. Any abandonment activities will require approval by the NEB.

### **3.0 PROJECT LOCATION AND MAPS**

#### **3.1 Regional Maps**

The route of the existing TMPL system is shown in the following regional maps:

- Figure 3-1 – Pipeline Route from Edmonton to Chip, AB
- Figure 3-2 – Pipeline Route from Niton to Jasper, AB
- Figure 3-3 – Pipeline Route from Jasper, AB, to Blue River, BC
- Figure 3-4 – Pipeline Route from Blue River to Darfield, BC
- Figure 3-5 – Pipeline Route from Black Pines to Kingsvale, BC
- Figure 3-6 – Pipeline Route from Kingsvale to Westridge, BC

These maps show the location of the project relative to other features, including major highways and communities. As discussed in Section 2.4.2.1, Planning and Engineering, the routing analysis and determination are currently underway to identify a preferred corridor for Line 2. Although the route shown on these maps is for Line 1, Line 2 is expected to parallel Line 1, except in areas where substantial engineering, environmental or urban development constraints exist. Development of a preferred corridor will involve discussions with affected landowners, municipalities, Aboriginal groups and stakeholders. Once a preferred route is established for Line 2, including those areas of constraint, it will be made available to the public.

Figure 3-7 shows the provincial parks, protected areas and recreation areas crossed by the Line 1 route. Detailed inset maps of the Indian reserves (IRs) along the existing route are shown on Figure 3-8.

Figure 3-9 shows the location of the TMPL system facilities, such as pump stations and terminals, located along the route.

#### **3.2 Description and Location of Lands**

Land ownership along the existing TMPL system corridor is a mixture of privately owned lands held in fee simple (i.e., the owner has absolute ownership of the land), provincial Crown lands (including provincial parks) and federal Crown lands (including national parks and IRs). In total, the existing TMPL system passes through 15 IRs, 12 provincial parks, including Mount Robson Provincial Park, and one federal park (i.e., Jasper National Park).

The Edmonton, Burnaby and Sumas terminals are located on lands owned by Trans Mountain. All three terminals are zoned as industrial sites. Details for the terminal sites are:

- Edmonton Terminal – about 49.1 ha (121.4 acres), legal land description – SW1/4, Section 5, Township 53, Range 23, west of the 4<sup>th</sup> meridian
- Burnaby Terminal – about 76.3 ha (188.6 acres), legal land description – Block C, except part subdivided by Plan 65962 DL 141 and 142, Group 1 NWD Plan 17387
- Sumas Terminal and pump station – about 80 ha (197.7 acres), legal land description – Lot 6 Section 32, Township 19, NWD Plan 28342 and Lot 10 Section 32, Township 19, NWD Plan 35866

The Westridge Marine Terminal is located on about 6.2 ha (15.4 acres) of land owned by Trans Mountain, with the exception of a small portion of land, located between the railway and the shoreline, which is leased from Canadian Pacific (legal land description – Lot 186 DL 216 Group 1 NWD Plan 38021). The water lot at the Westridge Marine Terminal is leased from the PMV. This lease covers about 13.8 ha (34.1 acres) of lands underlying Burrard Inlet. Some expansion of the existing water lot is expected to be required to accommodate the expanded dock facilities. Trans Mountain will work with the PMV to extend the spatial boundaries of the lease arrangement.

Trans Mountain owns sufficient lands for most of the pump stations required for the project. Lands for the new pump station will be required at Black Pines. The location for the new pump station will be determined as part of the routing and facilities location studies.

Construction of the new pipeline segments is expected to take place on privately owned lands, provincial Crown lands and, depending on final routing, provincial parks and IRs. Subsurface rights for the pipeline corridor will be determined as part of the project land acquisition program being implemented. Generally, subsurface rights are expected to reside with the Crown, and Crown rights holders will be engaged during land acquisition activities.

### **3.2.1      *Protected Areas***

As discussed in Section 2.3.1.1, the project scope includes reactivating two decommissioned pipeline segments:

- Hinton to Hargreaves
- Darfield to Black Pines

The scope of this reactivation will include installing automated MLBVs in Jasper National Park and Mount Robson Provincial Park in accordance with commitments Trans Mountain made to Parks Canada and BC Parks during the Anchor Loop Project.

The proposed pipeline corridor of the Alberta segment might cross the northern boundary of Wabamun Lake Provincial Park, as shown previously in Figure 3-7. The Alberta segment might also cross three environmentally significant areas, two of provincial importance and one of national importance.

The proposed pipeline corridor of the British Columbia segment might cross eight provincial parks and one designated recreation area, as shown previously in Figure 3-7. The following Government of British Columbia provincial management plans are in place for parks and protected areas along the TMPL system:

- Mount Robson Park Management Plan
- Management Direction Statement for Finn Creek Provincial Park
- Management Plan for Coldwater River Provincial Park
- Coquihalla Summit Recreation Area Master Plan
- Coquihalla River Recreation Area Master Plan
- Bridal Veil Park Master Plan

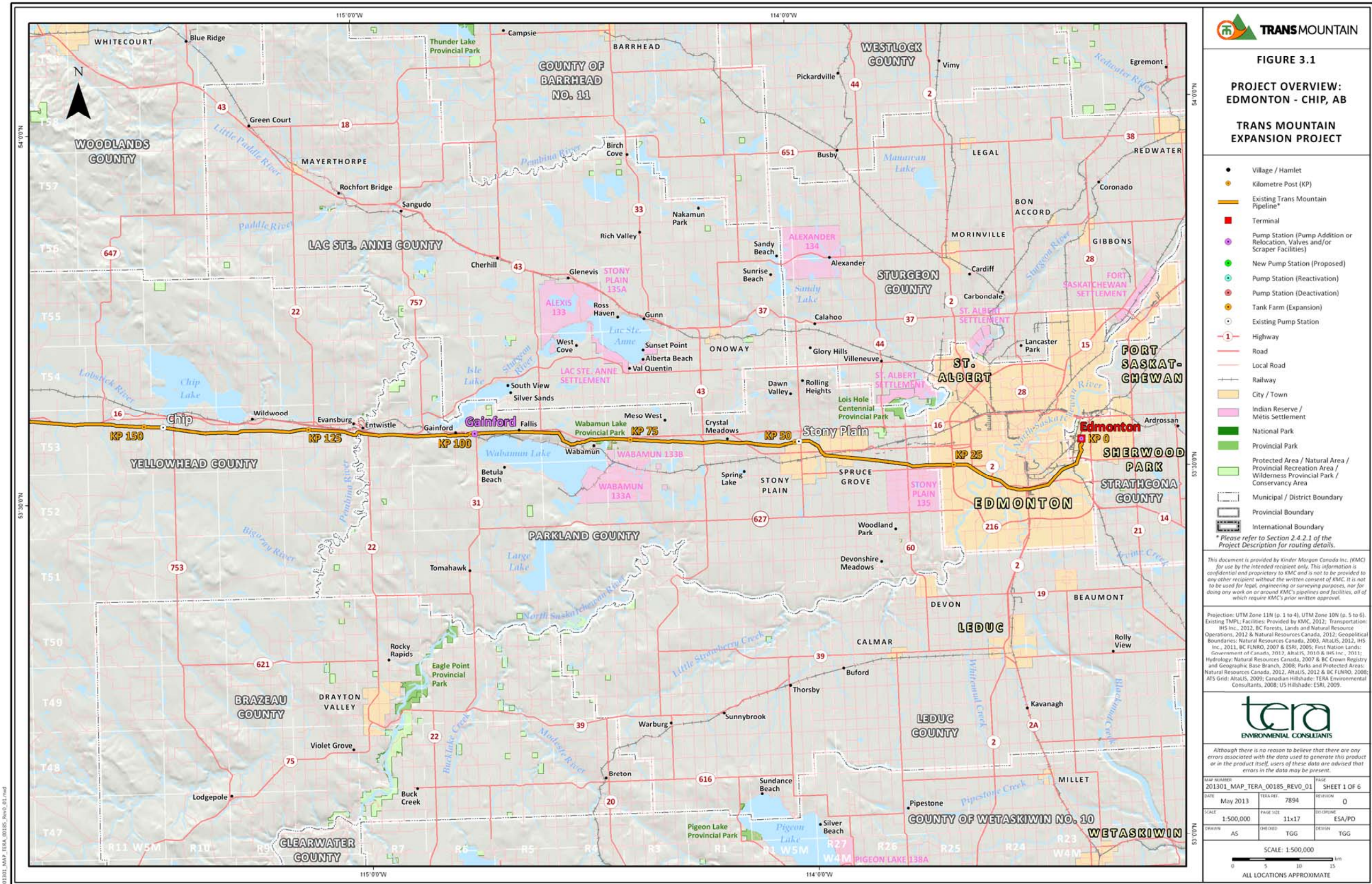


Figure 3-1: Pipeline Route from Edmonton to Chip, AB

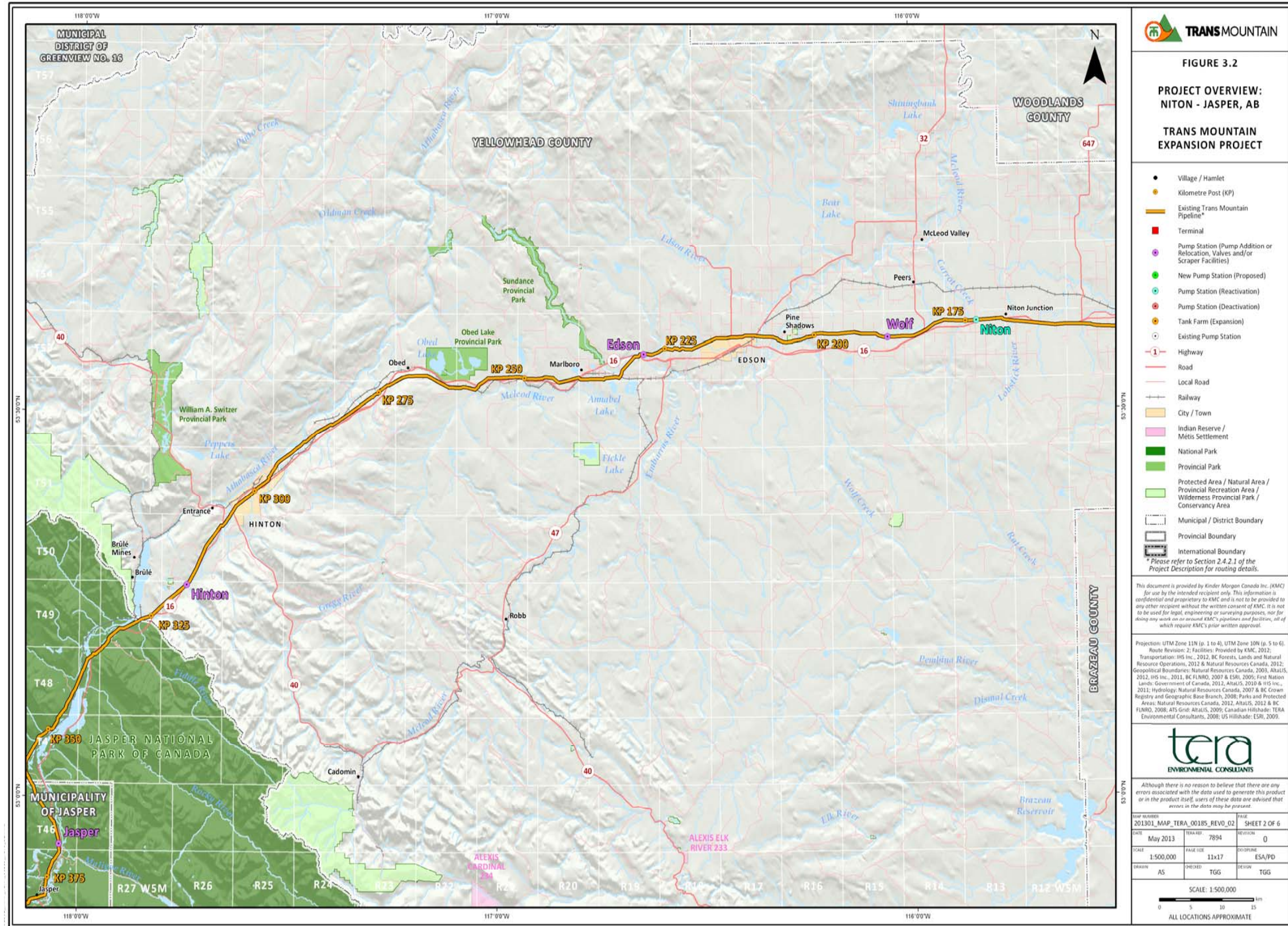


Figure 3-2: Pipeline Route from Niton to Jasper, AB



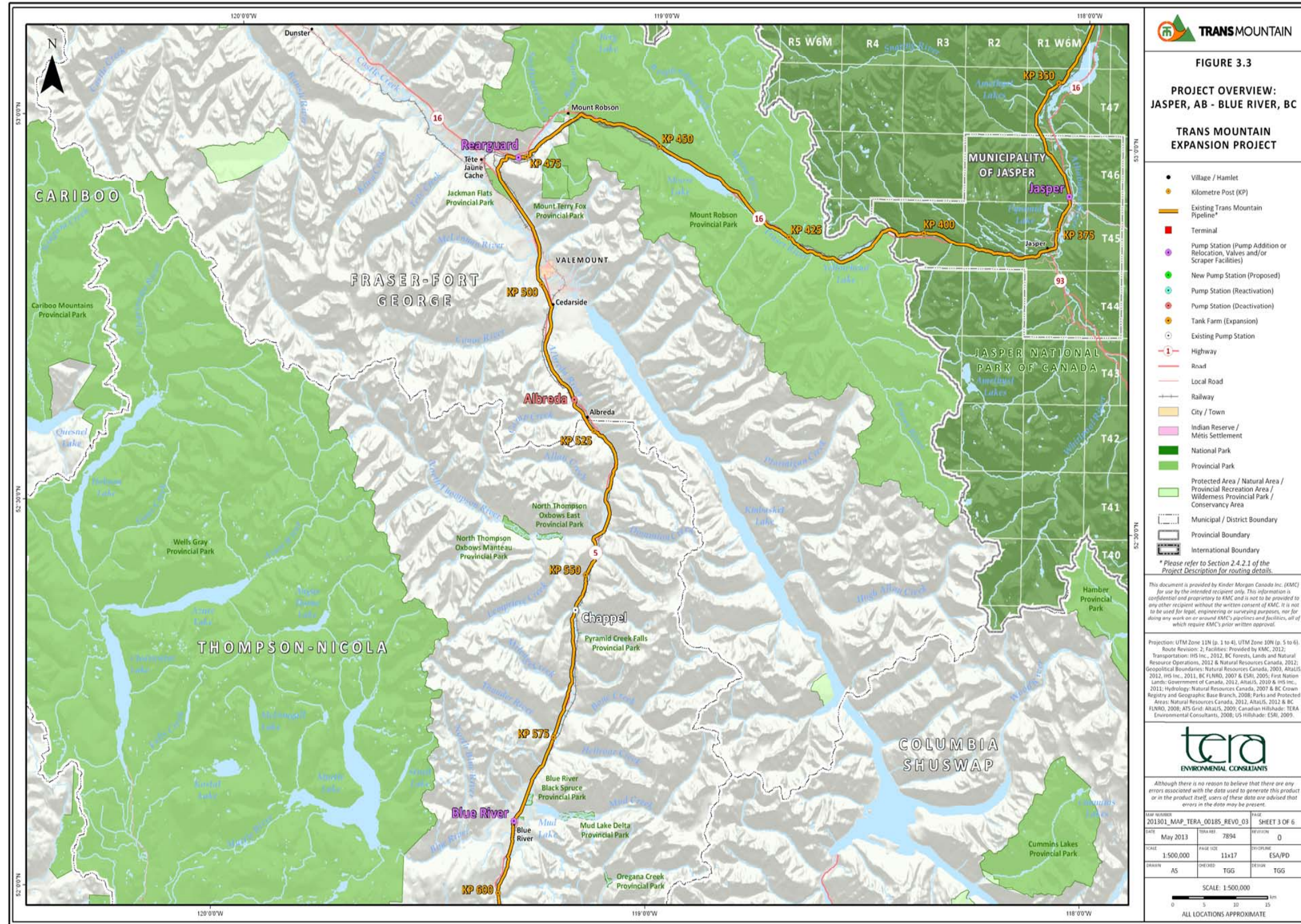


Figure 3-3: Pipeline Route from Jasper, AB, to Blue River, BC

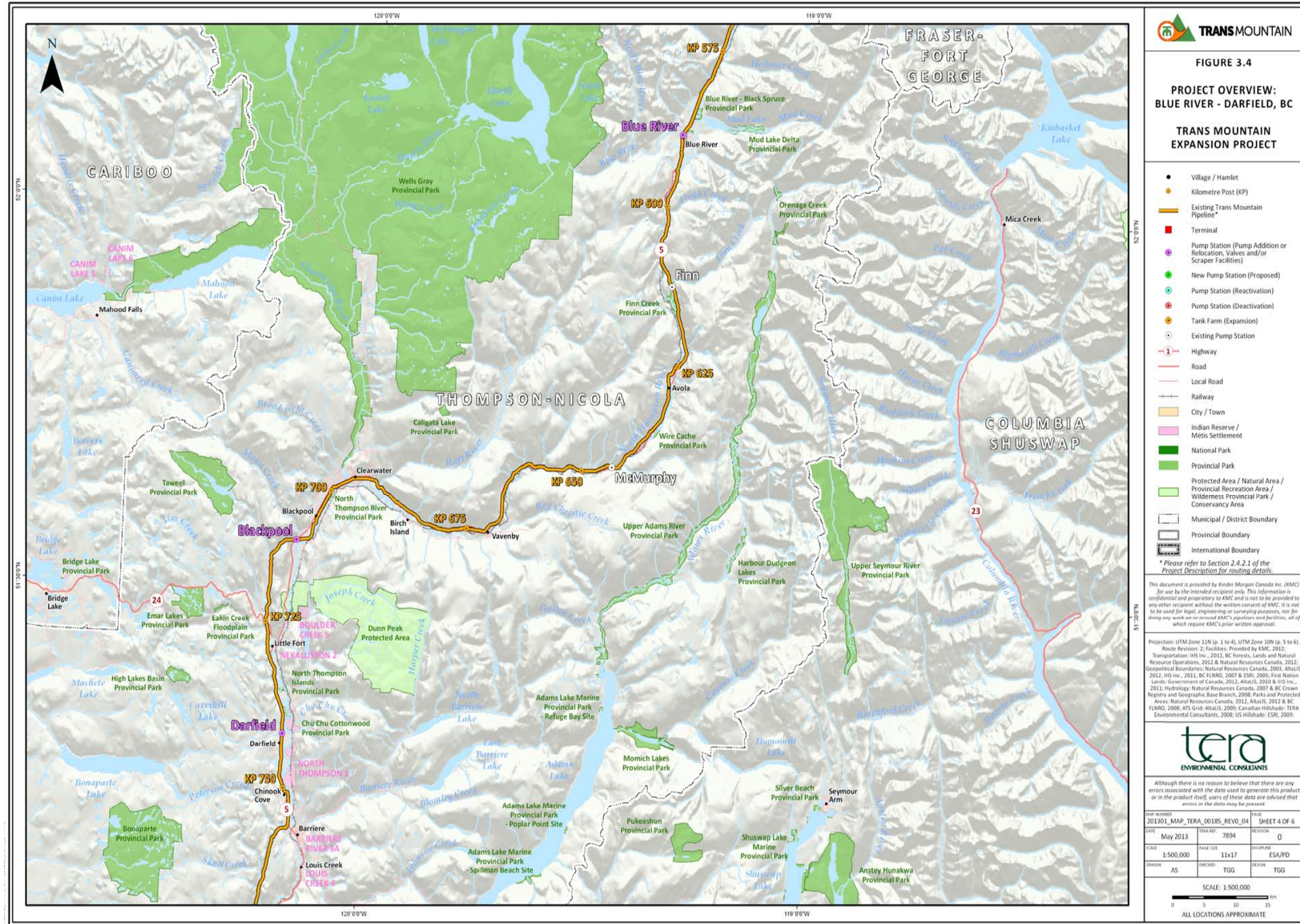


Figure 3-4: Pipeline Route from Blue River to Darfield, BC

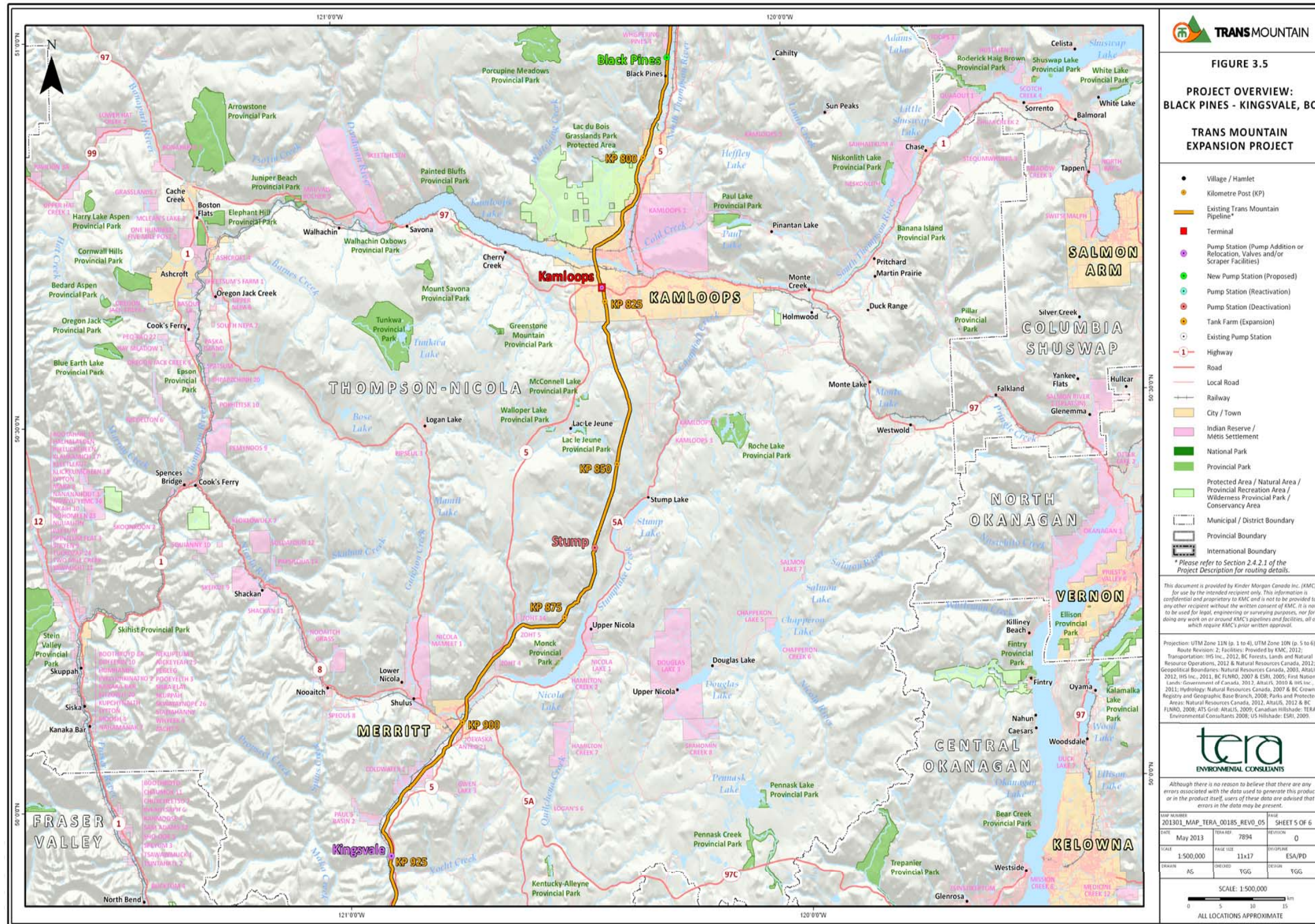


Figure 3-5: Pipeline Route from Black Pines to Kingsvale, BC

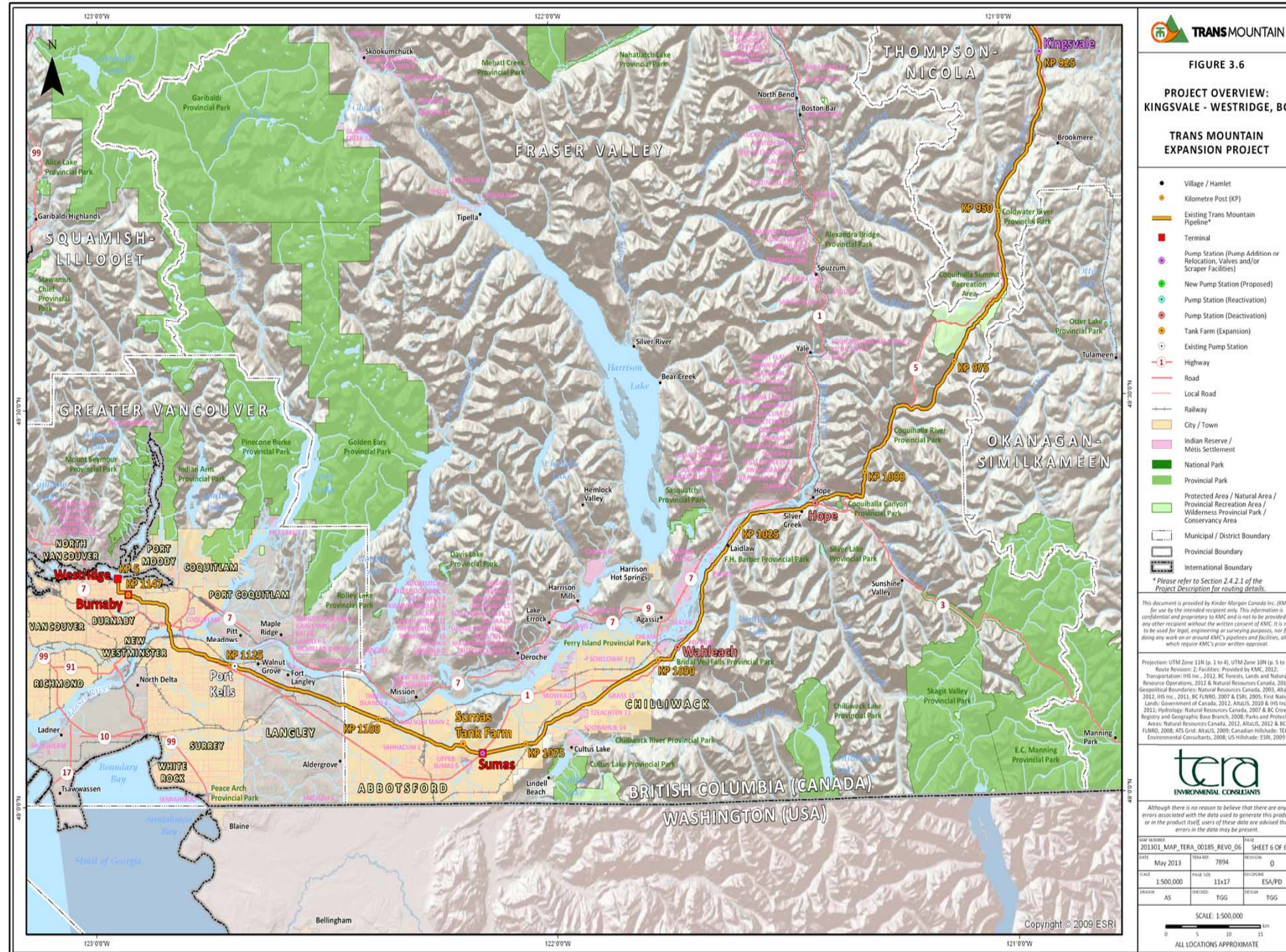


Figure 3-6: Pipeline Route from Kingsvale to Westridge, BC

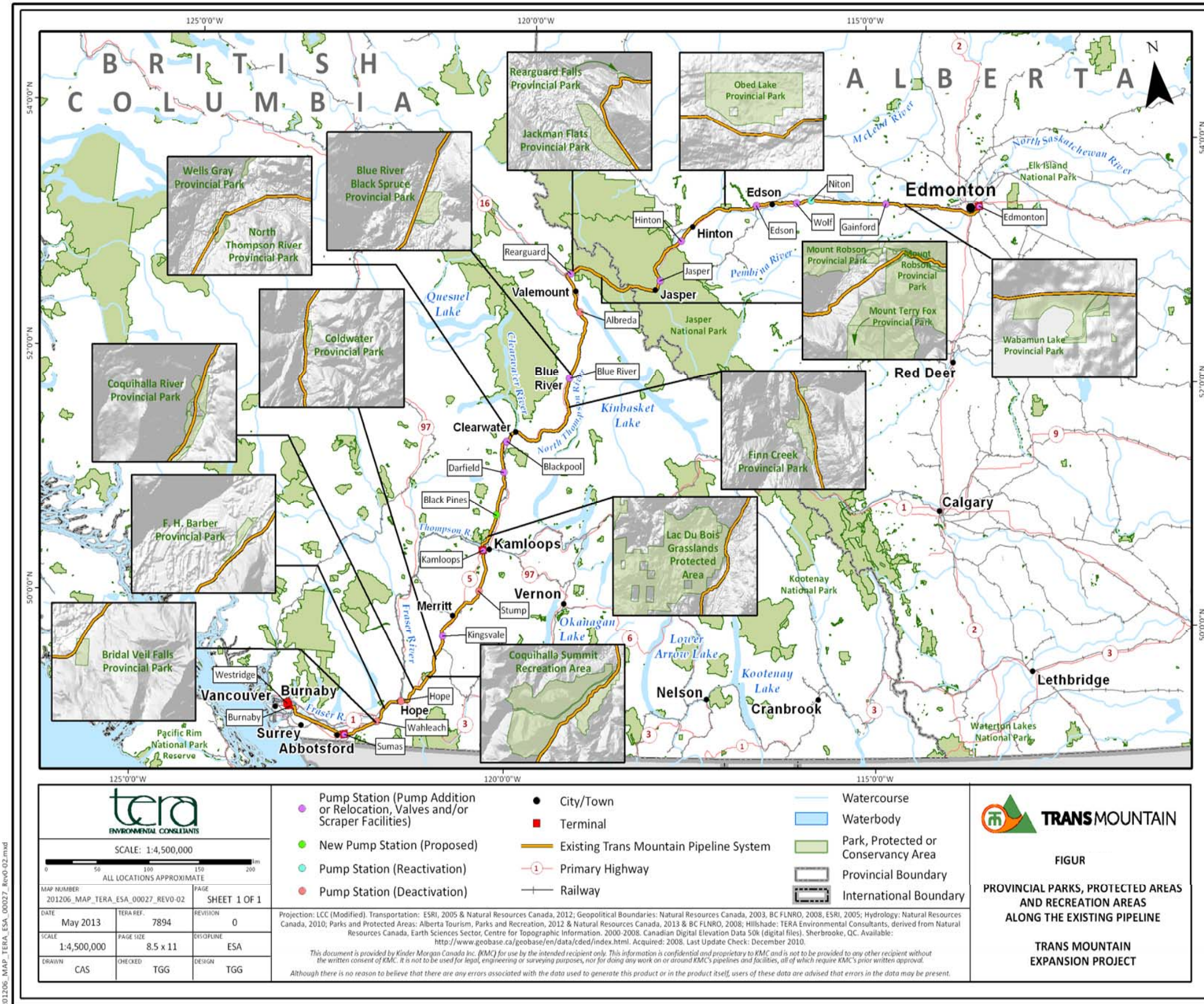


Figure 3-7: Provincial Parks, Protected Areas and Recreation Areas along the Project Corridor

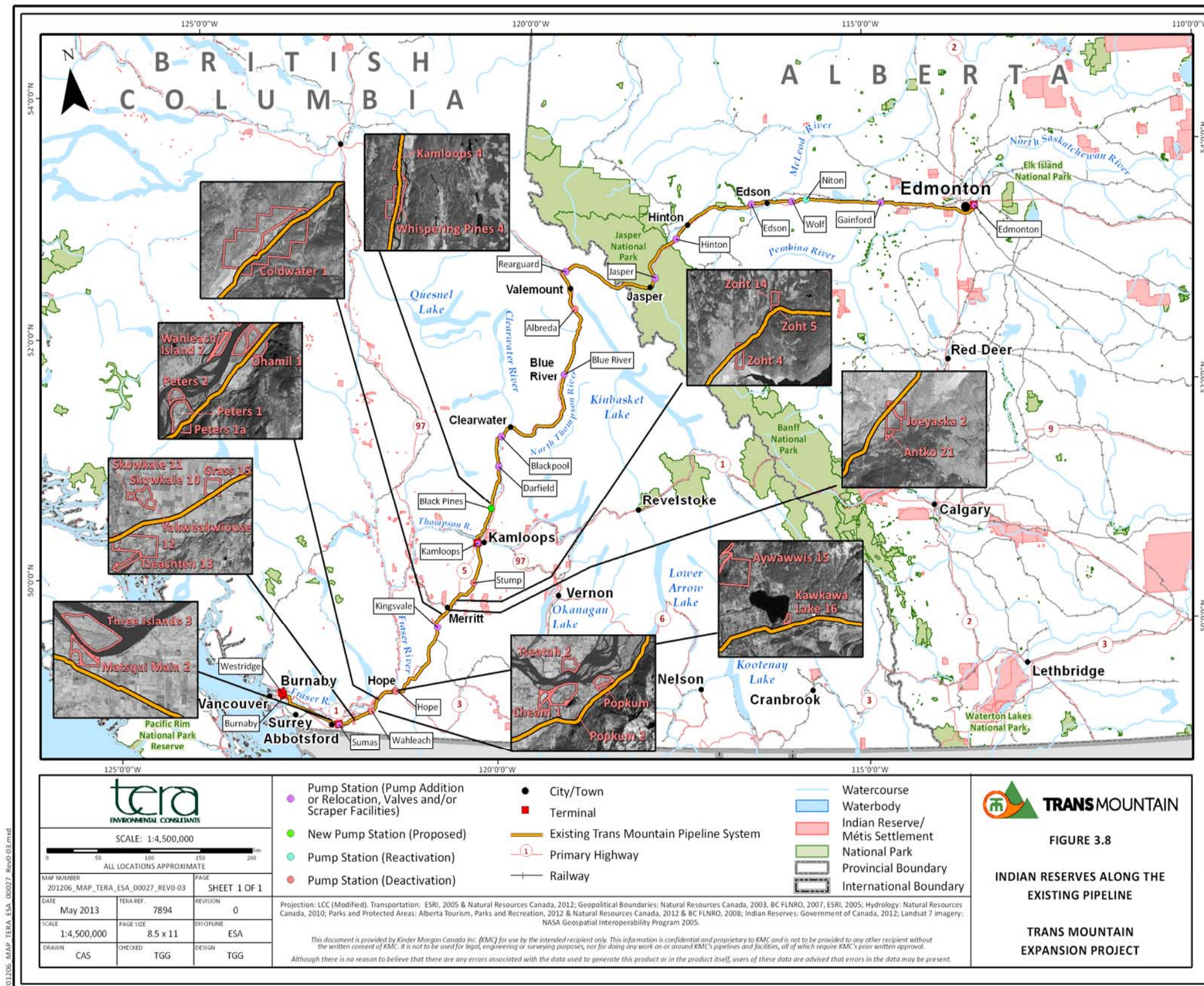


Figure 3-8: Indian Reserves along the Project Corridor

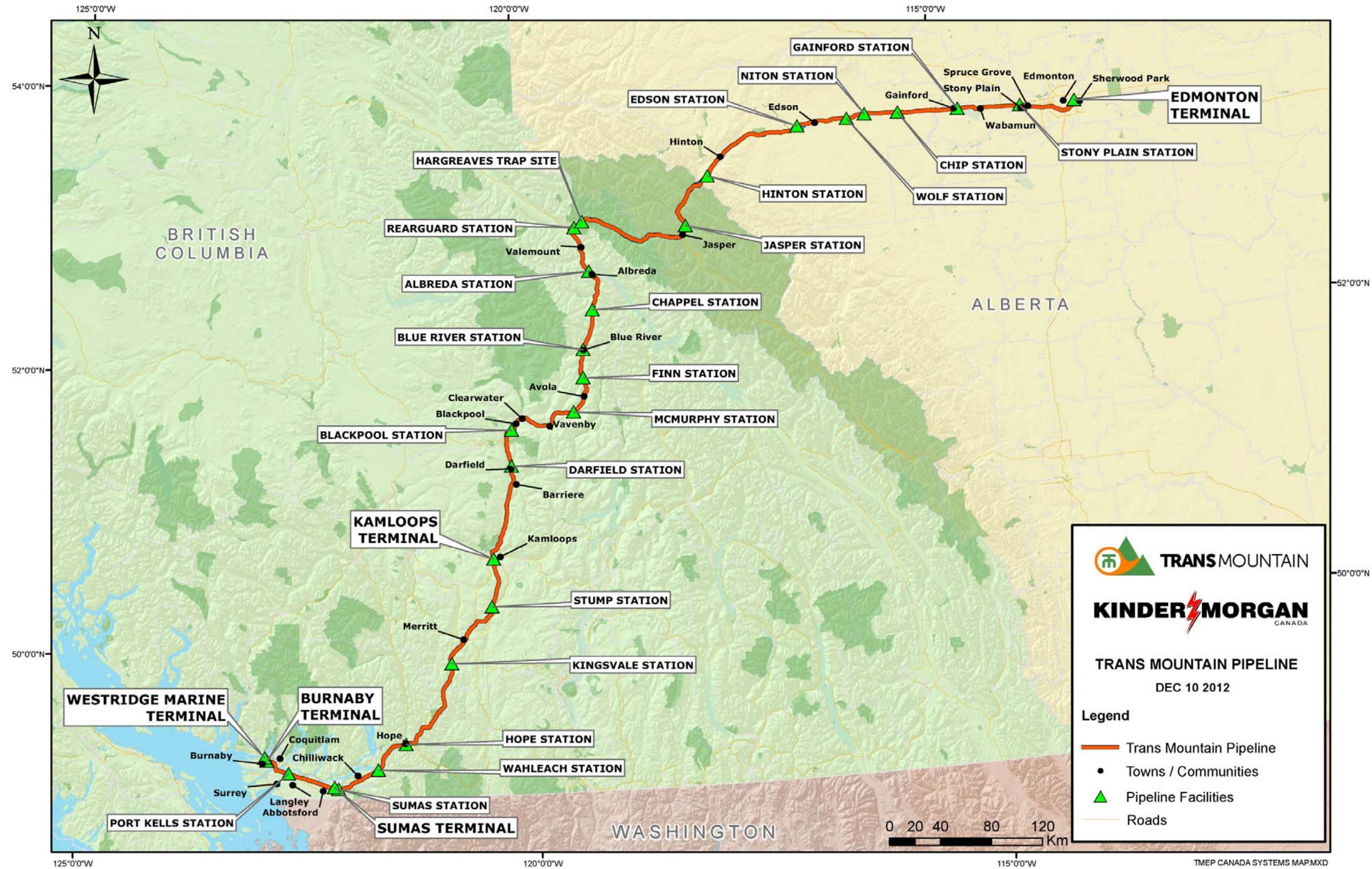


Figure 3-9: TMPL System Facilities Locations

### **3.2.2 Resource Management and Conservation**

The Alberta segment will cross lands located within the Upper Athabasca and North Saskatchewan planning regions. Regional plans for the Upper Athabasca and North Saskatchewan planning regions are currently under development by the Government of Alberta.

Resource management and conservation plans or strategies for lands to be crossed by the Alberta segment include the:

- Northern East Slopes Sustainable Resource and Environmental Management Strategy
- Coal Branch Sub-Regional Integrated Resource Plan
- Parkland County Draft Recreation, Parks and Open Space Master Plan

Resource management and conservation plans or strategies for lands to be crossed by the British Columbia segment include the:

- Valemount to Blue River Winter Recreation Sustainable Resource Management Plan
- Robson Valley Sustainable Land and Resource Management Plan
- Robson Valley Land and Resource Management Plan
- Kamloops Land and Resource Management Plan
- Eight Peaks Sustainable Resource Management Plan
- Chilliwack District Sustainable Resource Management Plan (British Columbia Ministry of Forests, Lands and Natural Resources Operations)

The British Columbia segment will also traverse a number of resource management zones, including:

- Rocky Mountain Trench (Robson Valley Special Resource Zone)
- Rearguard Falls (Robson Valley Existing Protected Area)
- Robson Valley Settlement/Agriculture Zone

### **3.3 Description and Location of Potentially Affected Parties**

The TMPL system traverses about 2,200 privately owned properties and 650 parcels of Crown and municipal land in Alberta and British Columbia.

#### **3.3.1 Alberta**

The Alberta segment will be located in various areas of land use, including:

- agricultural
- commercial
- guiding
- industrial
- oil and gas
- recreational
- rural and urban residential
- trapping

From east to west, the Alberta segment will cross Strathcona, Parkland and Yellowhead counties. Communities located along and near the Alberta segment include the:

- City of Edmonton
- City of Spruce Grove
- Town of Stony Plain
- Village of Wabamun
- Hamlet of Entwistle



- Hamlet of Evansburg
- Hamlet of Wildwood
- Town of Edson
- Town of Hinton

The Alberta segment will span areas ranging from very low to very high concentrations of permanent inhabitants. Higher population densities are generally found adjacent to Edmonton and other communities along the pipeline corridor. Rural areas along the pipeline corridor transition from predominantly privately owned agricultural land in the east to forested Crown land in the west.

Land use management plans and strategies for lands to be crossed by the Alberta segment include:

- Edmonton Strategic Plan
- Edmonton Municipal Development Plan
- Capital Region Growth Plan
- Parkland County Municipal Development Plan
- Parkland County Land Use Bylaw
- Yellowhead County Municipal Development Plan (in development)
- Yellowhead County Land Use Bylaw
- Spruce Grove Municipal Development Plan
- Stony Plain Municipal Development Plan
- Entwistle Area Structure Plan (Parkland County)
- Evansburg Area Structure Plan (Yellowhead County)
- Wildwood Area Structure Plan (Yellowhead County)
- Edson Urban Fringe Intermunicipal Development Plan (Yellowhead County)
- Edson Municipal Development Plan
- Hinton Community Development and Enhancement Plan
- Hinton Municipal Development Plan

The Alberta segment will cross about 13 trapping areas and several wildlife management units. There are no designated recreational sites along the proposed Alberta segment. Outdoor recreational activities (e.g., hunting, camping, hiking, mountain biking and snowmobiling) are expected to occur at numerous locations along the Alberta segment. Recreational fishing occurs on the large watercourses and lakes.

The Alberta segment will cross Treaty 6 and Treaty 8 territories and the Métis Nation of Alberta (Region 4). For more information on these treaty territories, see Section 4.1, Aboriginal Groups.

### **3.3.2      *British Columbia***

The British Columbia segment will be located in various areas of land use, including:

- agricultural
- commercial
- forestry
- guiding
- industrial
- mining
- recreational
- rural and urban residential
- trapping
- tourism

Communities, regional districts, provincial parks, protected areas, recreation areas and IRs located near the proposed British Columbia segment are listed in Table 3-1. Information provided in the table is based

on the project’s preliminary routing for the British Columbia segment. Depending on final routing, some provincial parks and IRs on this list might not be directly affected.

Land use management plans and strategies for lands to be crossed by the British Columbia segment include:

- Valemount Official Community Plan
- Blue River Official Community Plan (Thompson-Nicola Regional District)
- Kamloops Sustainable Kamloops Plan
- Kamloops Official Community Plan
- Merritt Official Community Plan
- Hope Official Community Plan (District of Hope)
- Regional Growth Strategy for the Fraser Valley Regional District
- Chilliwack Agricultural Area Plan
- Chilliwack Official Community Plan
- Langley Official Community Plan (Township of Langley)
- Surrey Official Community Plan
- Coquitlam Citywide Official Community Plan
- Burnaby Environmental Sustainability Strategy (in development)
- Burnaby Economic Development Strategy 2020
- Burnaby British Columbia Official Community Plan
- Metro Vancouver Regional Growth Strategy

**Table 3-1: IRs, Communities, Regional Districts, Parks and Protected Areas, Near the Proposed British Columbia Segment**

<b>Communities</b>	<b>Regional Districts</b>	<b>Provincial Parks, Protected Areas and Recreation Areas</b>	<b>Indian Reserves</b>
<ul style="list-style-type: none"> <li>• Village of Valemount</li> <li>• Community of Blue River</li> <li>• Community of Avola</li> <li>• Community of Vavenby</li> <li>• District of Clearwater</li> <li>• Village of Little Fort</li> <li>• City of Kamloops</li> <li>• City of Merritt</li> <li>• District of Hope</li> <li>• City of Chilliwack</li> <li>• City of Abbotsford</li> <li>• Township of Langley</li> <li>• City of Surrey</li> <li>• City of Coquitlam</li> <li>• City of Burnaby</li> </ul>	<ul style="list-style-type: none"> <li>• Fraser-Fort George Regional District</li> <li>• Thompson-Nicola Regional District</li> <li>• Fraser Valley Regional District</li> <li>• Greater Vancouver Regional District (Metro Vancouver)</li> </ul>	<ul style="list-style-type: none"> <li>• Bridal Veil Falls Provincial Park</li> <li>• Coldwater Provincial Park</li> <li>• Coquihalla River Provincial Park</li> <li>• F.H. Barber Provincial Park</li> <li>• Rearguard Falls Provincial Park</li> <li>• Blue River Black Spruce Provincial Park</li> <li>• Finn Creek Provincial Park</li> <li>• North Thompson River Provincial Park</li> <li>• Coquihalla Summit Recreation Area</li> </ul>	<ul style="list-style-type: none"> <li>• Coldwater No. 1</li> <li>• Zoht No. 5</li> <li>• Zoht No. 4</li> <li>• Joeyaska No. 2</li> <li>• Popkum No. 1</li> <li>• Popkum No. 2</li> <li>• Ohamil No. 1</li> <li>• Kawkawa Lake No. 16</li> <li>• Peters No. 1</li> <li>• Peters No. 1a</li> <li>• Grass No. 15</li> <li>• Tzeachten No. 13</li> <li>• Matsqui Main No. 2</li> <li>• T’kemlups (Kamloops No. 4)</li> <li>• Whispering Pines No. 4</li> </ul>

Population densities in British Columbia vary by region. Generally, areas of higher population density between the Alberta–British Columbia boundary and the District of Hope are concentrated around urban communities or adjacent to villages, towns and cities. The population density between urban areas is generally low (i.e., sparse), particularly in the mountainous areas between the communities of Valemount and Clearwater, and the City of Merritt and District of Hope.

Seasonal and temporary residency is more common in tourism-based areas, such as Valemount and Blue River or in places where cottages, resorts and campgrounds are located intermittently along the pipeline corridor. In contrast, high concentrations of permanent residents occur in the Lower Mainland, particularly in, and adjacent to, the cities of Chilliwack, Abbotsford, Surrey, Coquitlam and Burnaby, and the Township of Langley. The areas between urban areas are generally small acreages and farms.

Timber harvesting is the primary land use in the remote forested areas of the British Columbia segment. The British Columbia segment will traverse the Robson Valley, Kamloops, Merritt and Fraser timber supply areas. Agriculture (i.e., cultivated and tame pasture) is common along the lower North Thompson River valley. The lands surrounding the cities of Kamloops and Merritt are used as pasture and rangeland. Outside of urban centres, agriculture is the dominant land use in most of the Lower Mainland, particularly around the City of Chilliwack. The British Columbia segment will traverse an estimated 194 km of lands designated as agricultural land reserves by the British Columbia Agricultural Land Commission. The Black Pines pump station will be located on agricultural land reserve lands.

About 27 trapper boundaries and two guide outfitter concessions will be crossed by the British Columbia segment. The Black Pines pump station lies within a trapper boundary. Hunting is a widespread activity because of the extensive Crown land and productive ecosystems along much of the pipeline corridor. Tourism and recreational activities along the British Columbia segment include snowmobiling, riding of all-terrain vehicles, skiing, heli-skiing, fishing, mountain biking, hiking, camping, rafting, kayaking, canoeing and sightseeing.

## **4.0 ABORIGINAL ENGAGEMENT**

The Aboriginal engagement program for the project has been developed and operates under the following principles:

- Trust and Respect – Trust and respect form the basis of Trans Mountain’s engagement with Aboriginal peoples.
- Ensure Meaningful Consultation – Conduct meaningful consultation with Aboriginal peoples who assert Aboriginal and treaty rights.
- Address Legal Requirements – Carry out Trans Mountain’s legal requirements as a regulated company under NEB jurisdiction to consult with and mitigate, where necessary, project impacts.
- Provide Capacity Funding – Provide capacity funding, as appropriate, to Aboriginal peoples who might be directly affected by the project and who wish to engage in the consultation process.
- Gather Aboriginal Perspectives – Gather Aboriginal perspectives on rights and asserted rights, and identify issues and concerns relating to those rights and the project.
- Assess Project Impacts – Assess potential impacts and engage affected Aboriginal peoples in development of mitigation measures, where necessary.
- Reach Understandings – Reach understandings or agreements that address potential infringement of Aboriginal rights affected by the project.
- Benefits for Aboriginal Groups – Provide training and employment opportunities to Aboriginal peoples affected by the project and consider mutual benefit agreements, where appropriate.

### **4.1 Aboriginal Groups**

Based on previous relationships that have been developed and discussions with various agencies, Trans Mountain has identified over 103 Aboriginal groups that might have an interest in the project or have Aboriginal interests potentially affected by the project. Engagement activities started with these groups in April 2012.

Using existing relationships as a basis to identify Aboriginal groups potentially affected by the project, Trans Mountain then consulted with federal government departments and provincial ministries regarding which groups should be included in the engagement program. Consultations have taken place with representatives from:

- the NEB
- the Major Projects Management Office
- Aboriginal Affairs and Northern Development Canada
- the British Columbia Oil and Gas Commission
- Alberta Aboriginal Relations
- the British Columbia Ministry of Aboriginal Relations and Reconciliations

Trans Mountain will continue to consult with these departments and agencies, in addition to the Aboriginal groups listed, as the project develops to ensure all affected Aboriginal groups are included in the consultation program.

The Alberta segment will cross Treaty 6 and Treaty 8 territories. Treaty 6 territories were established in 1897 when the treaty was executed between the members of Treaty 6 and the Government of Canada. Treaty 8 territories were established in 1899 when the treaty was executed between the members of Treaty 8 and the Government of Canada. Métis groups with potential interest in the project include the Métis Nation of Alberta (Region 4). No IRs are crossed by the TMPL system in Alberta.

In British Columbia, the TMPL system crosses 15 IRs (see Table 3-1, shown previously) and will cross at least 24 traditional territories. There are 18 First Nations in British Columbia that have interests in the 15 IRs (some share a reserve).

Trans Mountain has identified a preliminary list of Aboriginal traditional territories (see Table 4-1). The list is not complete as several Aboriginal groups have not yet provided their territory maps. However, ongoing consultation and data collection is being conducted to verify and confirm all of the Aboriginal traditional territories along the proposed pipeline corridor, including Aboriginal groups whose traditional territories are near the project.

The pipeline will cross a variety of Aboriginal traditional territories from the Alberta–British Columbia boundary to Burrard Inlet. In these regions, there are substantial overlaps or shared territories.

**Table 4-1: Preliminary List of Aboriginal Traditional Territories near the Proposed BC Segment**

<b>From the AB–BC Boundary to Kamloops, BC</b>	<b>Kamloops to Hope, BC</b>	<b>Hope to Burrard Inlet, BC</b>
<ul style="list-style-type: none"> <li>• Canim Lake Lhtako Dene</li> <li>• Lheidli T'enneh Band</li> <li>• Northern Shuswap Treaty Society</li> <li>• Nlaka'pamux Nation</li> <li>• Okanagan Nation</li> <li>• Secwepemc (Shuswap)</li> <li>• Simpcw First Nation</li> <li>• Soda Creek</li> <li>• Tk'emlups</li> </ul>	<ul style="list-style-type: none"> <li>• Cheam</li> <li>• Hul,qumni'num Treaty Group (Marine)</li> <li>• Lower Nicola</li> <li>• Nlaka'pamux Nation</li> <li>• Okanagan Nation</li> <li>• Secwepemc (Shuswap)</li> <li>• Skwah</li> <li>• Stól:lō Nation</li> <li>• Tk'emlups</li> <li>• Union Bar</li> <li>• Yale</li> <li>• Upper Similkameen</li> </ul>	<ul style="list-style-type: none"> <li>• Chawathil</li> <li>• Cheam (Pilalt)</li> <li>• Chelalis</li> <li>• Hul'qumi'num Treaty Group (Core)</li> <li>• Hul'qumi'num Treaty Group (Marine)</li> <li>• Katzie</li> <li>• Kwantlen</li> <li>• Kwikwetlem</li> <li>• Leqamel</li> <li>• Matsqui</li> <li>• Musqueam Nation</li> <li>• Popkum</li> <li>• Scowlitz</li> <li>• Semiahmoo</li> <li>• Shxwowhamel</li> <li>• Skwah</li> <li>• Squamish Nation</li> <li>• Stól:lō Nation</li> <li>• Ts'elxweyeqw Tribe</li> <li>• Tsawwassen First Nation</li> <li>• Tsleil-Waututh Nation</li> <li>• Union Bar</li> </ul>

Métis groups with potential interest in the project include the Métis Nation British Columbia and the British Columbia Métis Federation.

Trans Mountain has begun and will continue to engage in meaningful consultation with Aboriginal groups that might be affected by the project. The consultation will include meaningful discussion about the project's potential environmental and socio-economic effects, pipeline routing, training, and employment and business opportunities. In addition, Aboriginal groups are leading or being included in the collection of traditional knowledge and traditional land use for the NEB application.

## 4.2 Engagement Program

Trans Mountain has organized its Aboriginal engagement program into five regions based on the location of Aboriginal groups along the pipeline route:

- Edmonton to the Alberta–British Columbia boundary
- The Alberta–British Columbia boundary to Kamloops
- Kamloops to Hope
- Hope to the Burnaby Terminal–Burrard Inlet
- the marine corridor from Burrard Inlet to international waters

Members of the Aboriginal engagement team have been assigned to each of the five regions based on their knowledge and experience with those Aboriginal groups. Each team consists of professionals experienced in consultation and environmental information-gathering with those groups.

The Aboriginal engagement team includes dedicated resource staff to work with Aboriginal groups along the pipeline route to identify Aboriginal businesses that might be interested in contracting opportunities on the existing TMPL system and the project. To date, Trans Mountain has identified ten Aboriginal businesses that have ISNetwork registration that provides them with the qualification to seek contract opportunities, many of whom Trans Mountain has assisted in obtaining their registrations. The identification of additional qualified businesses will continue through the pre-application and regulatory review process.

To enhance business opportunities for Aboriginal communities and businesses, Trans Mountain is developing an Aboriginal procurement strategy that will provide greater Aboriginal participation.

The Aboriginal engagement team also includes dedicated staff available to work with Aboriginal groups to identify education and training opportunities, recognizing that some of the opportunities require long lead times to bring individuals up to the required skill level.

To enhance skill development in support of the project, Trans Mountain is developing an employment and training policy.

## 4.3 Engagement Activities

Letters of engagement announcing the project and the pre-application phase were sent by mail on May 29, 2012, to over 100 Aboriginal groups. These engagement letters described the project in general terms and provided a project system map and project schedule.

The letter in the package included a personal commitment by the President of KMC that “Kinder Morgan Canada will be respectful, open, responsive and thorough in engaging with Aboriginal groups on the proposed expansion of the Trans Mountain Pipeline.” The letter also stated, “In this pre-application stage, we want to hear directly from you how the project may impact your community, to discuss any preliminary concerns you may have, and to explore opportunities for us to work cooperatively together in evaluating the project.” Shortly after this initial mail out, Aboriginal groups were contacted to determine how they preferred to be engaged.

In June and July 2012, members of the engagement team provided additional notifications of the toll application (described in Section 2.2, Commercial Basis for the Project) and the start of environmental field studies to Aboriginal groups, by either letter or personal contact.

Over 3,100 engagement activities have been carried out to date using a variety of communication tools, including face-to-face meetings, phone conversations, letters and emails.

In addition, copies of each Project Update Newsletter (see Section 5, Public Consultation) were either sent or given personally to representatives of each Aboriginal group. When public information sessions were held along the proposed line, Aboriginal groups were invited and members of the Aboriginal

engagement team attended most of the 37 sessions to address Aboriginal issues and to host First Nations who attended. When asked by a First Nation, the aboriginal engagement team also held information sessions for that community.

Trans Mountain has included an ‘Aboriginal Peoples’ section on its website to discuss Aboriginal engagement and Aboriginal participation in the project and enable Aboriginal groups to contact Trans Mountain, ask questions and learn more about the project. This section of the website will continue to be updated as the project moves forward.

#### **4.4 Traditional Land and Resource Use**

Trans Mountain has invited and engaged Aboriginal groups in preparing and participating in environmental field studies, traditional land use studies, and in the contribution of traditional ecological knowledge during the environmental field studies. Trans Mountain believes that ongoing engagement will assist the project staff to understand the relationship between the project and lands used for traditional purposes.

Furthermore, Trans Mountain plans to incorporate issues and concerns identified by potentially affected Aboriginal groups into its ESA of the pipeline, facilities and tanker traffic. This process is expected to include the compilation of traditional resource use studies through background research, interviews with Aboriginal elders, map reviews and field visits. The approach will be refined through discussions with Aboriginal groups.

Engagement efforts are ongoing with all identified Aboriginal groups.

#### **4.5 Key Comments and Concerns**

Although the Aboriginal engagement program is in its early stages, preliminary discussions with Aboriginal groups have identified some areas of interest and potential concern. Table 4-2 provides a sampling of Aboriginal groups’ interests and concerns collected by the Aboriginal engagement team to date.

#### **4.6 Future Engagement Activities**

During the period between filing the PD and filing the facilities application, Trans Mountain will continue to share information about the project with all Aboriginal groups. Engagement activities will focus on:

- routing options
- identifying impacts and concerns
- finalizing traditional land use and traditional marine use studies
- identifying education, training and business opportunities for the project
- discussing the adequacy of planned impact mitigation and opportunities
- refining traditional territory maps as they relate to the project, including overlaps or shared territories
- enhancing trusting and respectful relationships
- negotiating group and community-specific protocols, capacity agreements, letters of understanding and mutual benefit agreements with those Aboriginal groups engaging in the project

Trans Mountain will continue its engagement with Aboriginal groups following the submission of its NEB application, and will continue engagement through the regulatory process and into project development and operations. Trans Mountain will also continue its liaison with the Crown through the full project and provide updates regarding Trans Mountain’s engagement activities with Aboriginal groups.

**Table 4-2: Aboriginal Groups' Interests and Concerns Identified to Date**

Category	Sample Interests and Concerns Raised
Regulatory process	<ul style="list-style-type: none"> <li>• the adequacy and suitability of the NEB process to address Aboriginal interests</li> <li>• whether the NEB has participation or capacity funding in place, and whether such funding will be adequate to engage in this process</li> </ul>
Land environment	<ul style="list-style-type: none"> <li>• protection of the environment</li> <li>• environmental impact of spills on land and in water</li> <li>• the effect that spills might have on traditional activities</li> <li>• the number and size of historical spills on the TMPL system</li> <li>• the effect that spills or pipeline leaks might have on water supply</li> <li>• limited land area of IRs for water wells and potential effects on aquifers</li> <li>• protection of inland fisheries</li> <li>• wildlife health and well-being</li> </ul>
Marine environment	<ul style="list-style-type: none"> <li>• environmental impact of spills on the marine environment</li> <li>• clarification on dredging in proximity to the Westridge Marine Terminal</li> <li>• impact of increased tanker traffic through Burrard Inlet</li> <li>• clarification on the size of tankers</li> <li>• pollution at the Westridge Marine Terminal</li> </ul>
Routing	<ul style="list-style-type: none"> <li>• locations of portions of the project that traverse Aboriginal territories and IRs</li> </ul>
Socio-economic interests	<ul style="list-style-type: none"> <li>• impacts on traditional hunting and fishing areas, gathering areas, sacred sites, highly sensitive areas and wildlife habitat</li> <li>• protection of heritage resources</li> <li>• the need to resolve historical issues first, before participating in the project review</li> <li>• employment</li> <li>• skills development</li> <li>• contracting opportunities on both the existing and expanded TMPL system</li> <li>• preferred procurement opportunities</li> <li>• revenue sharing</li> <li>• community enhancement opportunities</li> <li>• equity participation</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• safety issues</li> <li>• potential pipeline failures</li> </ul>
Engagement	<ul style="list-style-type: none"> <li>• respectful and meaningful engagement</li> <li>• consultation should be with the Crown</li> <li>• participation in environmental field studies</li> <li>• capacity funding</li> <li>• traditional land use studies funding</li> </ul>



## **5.0 PUBLIC CONSULTATION**

The public consultation program for the project has been designed to reflect the diverse and varied interests of the communities and areas that the pipeline traverses. The following principles have been and will continue to be used to guide the development and execution of the public consultation program:

- **Shared Process** – Design the engagement program based on public input, taking into consideration various stakeholder groups’ interests, knowledge levels, time and preferred method of engagement.
- **Respect** – Respect individual values, recognize the legitimacy of people’s concerns and value the input they can provide.
- **Timeliness** – Initiate consultation processes as early as possible to provide adequate time for stakeholders to assess information and provide input.
- **Relationship Building** – Instill confidence in the public by remaining committed to being a good neighbour with the goal of establishing and maintaining positive long-term relationships with stakeholders.
- **Communication** – Facilitate the involvement of potentially affected parties, listen and gather input, work collaboratively to resolve concerns. Use multiple channels for communication to meet the communication needs of diverse stakeholder groups.
- **Responsiveness** – Use participants’ input, and provide them with timely feedback on how their input has affected plans and decisions, where feasible.
- **Accountability** – Address issues as they emerge. Trans Mountain believes that effective problem solving and mitigation strategies can be identified through consultation with stakeholders.
- **Transparency** – Document and act on the commitments made to stakeholders. Where Trans Mountain is unable to act on input received, Trans Mountain will explain why.
- **Local and Mutual Benefits** – Seek solutions to challenges that result in shared benefits for all interests.
- **Local Focus** – Seek local input and understanding of the region, its people, the environment and reflect local values and attitudes in Trans Mountain’s communications with stakeholders.
- **Sustainability** – Report on a triple bottom line of social, environmental and economic concerns raised, and identify how these concerns might be addressed.

### **5.1 Overview of Consultation Activities**

Trans Mountain recognizes that the project is a major infrastructure project and, as such, the public will have an interest in the project’s scope, environmental assessment and routing. Trans Mountain has begun meaningful consultation with affected stakeholders regarding the project corridor, environmental impacts, socio-economic impacts and benefits, and will continue to do so. Although detailed routing studies are pending, a preliminary evaluation of the project corridor and surrounding communities has identified the stakeholder groups expected to have an interest in the project (see Table 5-1).

As Trans Mountain progresses through the engagement phases and activities, feedback will be incorporated into the development of the facilities application and project planning. In addition, Trans Mountain will continue to report to stakeholders on where feedback has been incorporated into the project plans.

**Table 5-1: Potential Stakeholder Groups**

Stakeholder Type	Stakeholder Type Sub-Categories
Landowners and residents	<ul style="list-style-type: none"> <li>• landowners and residents directly affected by the existing and proposed pipeline right-of-way</li> <li>• landowners and residents within proposed temporary workspace areas</li> <li>• landowners and residents adjacent to the pipeline right-of-way</li> </ul>
Crown land rights holders	<ul style="list-style-type: none"> <li>• Crown land disposition holders</li> <li>• trappers</li> <li>• guides and outfitters</li> <li>• mineral, forest and other tenure holders</li> </ul>
Governments	<ul style="list-style-type: none"> <li>• Government of Canada</li> <li>• Government of Alberta</li> <li>• Government of British Columbia</li> <li>• municipal governments</li> <li>• regional governments</li> </ul>
Environmental non-governmental organizations (ENGOS)	<ul style="list-style-type: none"> <li>• local ENGOS</li> <li>• national ENGOS</li> </ul>
Special interest groups	<ul style="list-style-type: none"> <li>• chambers of commerce</li> <li>• economic development associations</li> <li>• recreation groups</li> <li>• labour groups</li> <li>• local interest groups</li> <li>• local and regional associations and organizations</li> <li>• business associations</li> </ul>
Industry	<ul style="list-style-type: none"> <li>• tourism industry</li> <li>• oil and gas industry</li> <li>• pipeline industry</li> <li>• Trans Mountain shippers</li> <li>• marine industry</li> <li>• potential suppliers and contractors</li> </ul>
Public	<ul style="list-style-type: none"> <li>• public living or working in pipeline communities</li> <li>• public living or working in marine shipping route communities</li> <li>• public living outside of project corridor or marine communities</li> </ul>

**5.1.1 Geographic Reach of Public Consultation Program**

Although the public consultation program will focus on stakeholders directly affected by the project, Trans Mountain also recognizes that the extensive scope and scale of the project will result in interest by members of the broader public. The public consultation program and team has been designed to include these stakeholders. Core communities that are the focus of the public consultation program are listed in Table 5-2 for pipeline route communities and in Table 5-3 for marine corridor communities in BC.

As Trans Mountain proceeds through the pre-application phase of the project, the public consultation program is sufficiently flexible to allow for the identification of new information and additional stakeholders.

**Table 5-2: Public Engagement – Pipeline Route Core Communities**

Engagement Region		
Alberta	BC Interior	Fraser Valley and Lower Mainland
<ul style="list-style-type: none"> <li>• City of Edmonton</li> <li>• City of Spruce Grove</li> <li>• Hamlet of Evansburg</li> <li>• Hamlet of Entwistle</li> <li>• Hamlet of Gunn</li> <li>• Municipality (Town) of Jasper</li> <li>• Parkland County</li> <li>• Strathcona County</li> <li>• Town of Edson</li> <li>• Town of Hinton</li> <li>• Town of Stony Plain</li> <li>• Village of Wabamun</li> <li>• Yellowhead County</li> </ul>	<ul style="list-style-type: none"> <li>• City of Kamloops</li> <li>• City of Merritt</li> <li>• Community of Avola</li> <li>• Community of Blue River</li> <li>• Community of Blackpool</li> <li>• Community of Vavenby</li> <li>• District of Barriere</li> <li>• District of Clearwater</li> <li>• District of Hope</li> <li>• Fraser Fort George Regional District</li> <li>• Thompson-Nicola Regional District</li> <li>• Village of Valemount</li> </ul>	<ul style="list-style-type: none"> <li>• City of Abbotsford</li> <li>• City of Burnaby</li> <li>• City of Chilliwack</li> <li>• City of Coquitlam</li> <li>• City of Port Coquitlam</li> <li>• City of Port Moody</li> <li>• City of Surrey</li> <li>• Fraser Valley Regional District</li> <li>• Metro Vancouver</li> <li>• Township of Langley</li> </ul>

**Table 5-3: Public Engagement – Marine Corridor Core Communities in BC**

Engagement Region	
Metro Vancouver and Burrard Inlet	Island and Coastal
<ul style="list-style-type: none"> <li>• City of North Vancouver</li> <li>• City of Port Moody</li> <li>• City of Richmond</li> <li>• City of Vancouver</li> <li>• City of White Rock</li> <li>• Corporation of Delta</li> <li>• District of North Vancouver</li> <li>• District of West Vancouver</li> <li>• Municipality of Bowen Island</li> <li>• UBC Endowment Lands Electoral Area</li> <li>• Village of Anmore</li> <li>• Village of Belcarra</li> </ul>	<ul style="list-style-type: none"> <li>• Capital Regional District</li> <li>• City of Colwood</li> <li>• City of Duncan</li> <li>• City of Langford</li> <li>• City of Nanaimo</li> <li>• City of Port Alberni</li> <li>• City of Victoria</li> <li>• Cowichan Valley Regional District</li> <li>• District of Central Saanich</li> <li>• District of Metchosin</li> <li>• District of North Cowichan</li> <li>• District of North Saanich</li> <li>• District of Oak Bay</li> <li>• District of Saanich</li> <li>• District of Sechelt</li> <li>• District of Sooke</li> <li>• Island Local Trust Areas</li> <li>• Juan de Fuca Electoral Area</li> <li>• Salt Spring Island Electoral Area</li> <li>• Sunshine Coast Regional District</li> <li>• Town of Gibsons</li> <li>• Town of Ladysmith</li> <li>• Town of Sidney</li> <li>• Town of View Royal</li> <li>• Township of Esquimalt</li> </ul>

**5.1.2 Engagement Activities Completed to Date**

The following is a summary of public consultation activities undertaken between the time of the project announcement and the filing of this PD:

- engagement Phase 1, from May to September 2012
- engagement Phase 2, from September 2012 to April 2013
- engagement Phase 3 from February 2013 – July 2013. Phase 3 engagement activities include activities completed up to the filing of the Project Description. The Phase 3 engagement activities planned through to July 2013 are outlined in Section 5.3, and the results of these activities will be included in the application.

#### *5.1.2.1 Engagement Phase 1 (May to September 2012)*

The goals of engagement Phase 1 were:

- introduce the project and provide project information to governments, municipalities and key stakeholders
- identify stakeholders interested in participating in the consultation program
- identify local community interests and concerns
- identify appropriate consultation methods by listening to stakeholders and determining how they want to be consulted
- provide accurate information and correct any misinformation about the project

#### **Project Introduction Materials**

As part of the initial project announcement, Trans Mountain distributed introductory project materials that included:

- the June 2012 Project Update Newsletter that described the project, a preliminary schedule and information on the planned engagement program
- copies of a Field Studies Brochure that provided an overview of the environmental and routing field studies that would be conducted in support of the ESA

These introductory project materials were:

- mailed or emailed to all Trans Mountain's stakeholders
- posted on the Trans Mountain website
- hand delivered to landowners during visits from land agents
- hand delivered to stakeholders at project introduction meetings

#### **Project Introduction Mail-Out and Phone Calls**

On June 16, 2012, the project introductory materials were emailed to a list of key stakeholders, including municipal governments, and Members of the Legislative Assembly (MLAs) of Alberta and British Columbia, and federal Members of Parliament (MPs) that represent constituencies located along the existing and proposed pipeline corridor. On July 8, 2012, a similar package of project introductory materials was issued to municipal governments, and MLAs and MPs that represent potentially interested coastal communities. The introductory package included:

- a letter introducing the project, notification of the toll application for the project filed with the NEB on June 29, 2012, and an overview of summer field activities
- the June 2012 Project Update Newsletter
- the Field Studies Brochure

In addition to the project introductory package, follow-up phone calls were placed to the MLAs, MPs and municipal governments between June 12 and July 20, 2012.

### **Website**

The project website, [www.transmountain.com](http://www.transmountain.com), was launched on May, 29 2012, and content continues to be added. The website:

- provides an overview of all facets of the project
- contains copies of all project materials created to respond to public inquiries
- identifies communication methods for contacting project representatives
- hosts an online discussion forum and other digital engagement tools
- contains operational information for the existing pipeline and marine corridor

### **Phone Line and Email Address**

A toll-free phone line and a project email address were launched on May 29, 2012. The toll-free phone line and email address are staffed during regular business hours. Trans Mountain endeavours to respond to stakeholder enquiries within five business days.

### **Project Introduction Meetings and Workshops**

Project introduction meetings have been offered to all municipal governments, elected officials and key stakeholders near the pipeline and marine corridors who have expressed an interest in the project. To date, a number of meetings, presentations and workshops have also been held with ENGOs and other interest groups. These meetings will be ongoing throughout the life of the project as new stakeholders are identified.

From May to September 2012, 84 phone calls were received and responded to through the 1-800 line and 65 emails were received and responded to through the project email address.

#### **5.1.2.2 *Engagement Phase 2 (September 2012 to April 2013)***

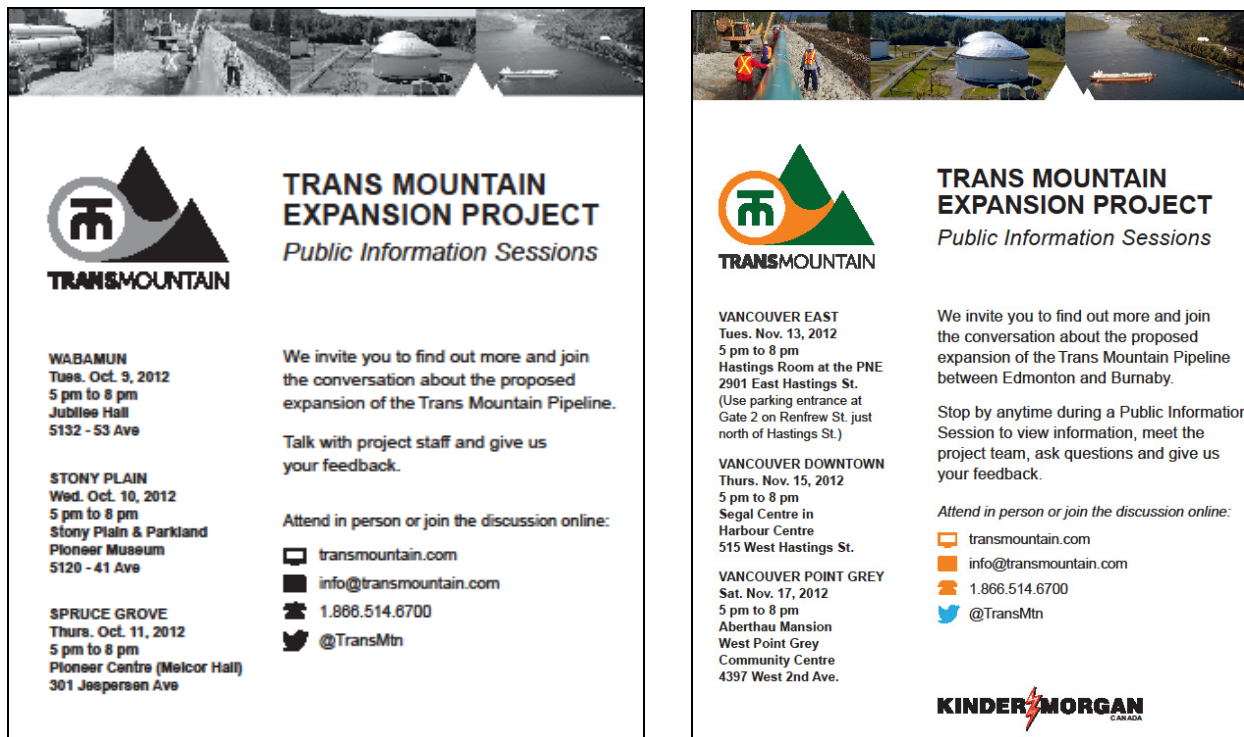
Phase 2 of the engagement program continued the outreach and discussions with municipalities and other stakeholders. In addition, Trans Mountain conducted a series of public information sessions along the pipeline and marine corridors. Content and format varied in response to the identified needs and interests of the communities. Engagement topics included:

- a project overview and introductory information
- the scope of the land and marine environmental assessments
- the scope of the socio-economic assessment

### **Public Information Session Notification**

Several notification methods were used to create awareness of the public information sessions (see Figure 5-1), including:

- advertisements in local newspapers running for two weeks before the information session was held
- notification to local stakeholders inviting them to attend information sessions and to distribute the invitation to their networks
- posting information session notices on county, regional district and municipal websites
- posting information session notices in local community halls, libraries and other public venues



**Figure 5-1: Sample Advertisement Placed in Local Newspapers (Right) and Sample Poster Emailed to Municipalities and Community Groups and Posted in Community Spaces (Left)**

### Public Information Sessions Timing

Public information sessions started in October 2012 and continued to mid-January 2013. A total of 37 sessions took place in 32 communities along the pipeline and marine corridors (see Table 5-4). Most of the sessions ran for three hours, with five sessions running for two hours. The sessions were held either on a weeknight or on a Saturday afternoon.

### Public Information Sessions Format and Results

#### *Pre-Briefing Sessions*

In many communities, pre-briefing sessions were held just before the public information sessions. Municipal government officials, elected provincial and federal government representatives, community groups and neighbourhood associations were invited via phone calls and personal emails to attend the pre-briefing sessions, review the information materials, speak with project representatives and voice their particular thoughts and concerns. The groups and individuals invited to the pre-briefing sessions varied by community.

**Table 5-4: Public Information Sessions – Locations and Dates**

<b>Region</b>	<b>Community</b>	<b>Date and Time</b>	<b>Number of Attendees</b>
Alberta	Wabamun	October 9, 2012, 5:00 – 8:00 p.m.	12
	Stony Plain	October 10, 2012, 5:00 – 8:00 p.m.	3
	Spruce Grove	October 11, 2012, 5:00 – 8:00 p.m.	12
	Edson	October 16, 2012, 5:00 – 8:00 p.m.	35
	Hinton	October 17, 2012, 5:00 – 8:00 p.m.	12
	Jasper	October 18, 2012, 5:00 – 8:00 p.m.	15
	Edmonton – Central	October 22, 2012, 5:00 – 8:00 p.m.	5
	Edmonton – North	October 23, 2012, 5:00 – 8:00 p.m.	10
	Sherwood Park	October 24, 2012, 5:00 – 8:00 p.m.	12
	Edmonton – South	October 25, 2012, 5:00 – 8:00 p.m.	11
BC Interior	Kamloops	October 29, 2012, 5:00 – 8:00 p.m.	40
	Merritt	October 30, 2012, 5:00 – 8:00 p.m.	80
	Valemount	November 5, 2012, 5:00 – 8:00 p.m.	73
	Blue River	November 6, 2012, 5:00 – 8:00 p.m.	38
	Clearwater	November 7, 2012, 5:00 – 8:00 p.m.	12
BC Fraser Valley and Metro Vancouver	Belcarra	November 6, 2012, 5:00 – 7:00 p.m.	106
	Abbotsford 1	November 17, 2012, 1:00 – 4:00 p.m.	46
	Coquitlam	November 20, 2012, 5:00 – 8:00 p.m.	78
	Surrey	November 21, 2012, 5:00 – 8:00 p.m.	44
	Langley	November 22, 2012, 5:00 – 8:00 p.m.	54
	Burnaby 1	November 24, 2012, 1:00 – 4:00 p.m.	98
	Burnaby 2	November 26, 2012, 5:00 – 8:00 p.m.	118
	Chilliwack	November 27, 2012, 5:00 – 8:00 p.m.	79
	Hope	November 28, 2012, 5:00 – 8:00 p.m.	69
	Abbotsford 2	November 29, 2012, 5:00 – 8:00 p.m.	39
BC Lower Mainland	North Vancouver	November 3, 2012, 4:00 – 7:00 p.m.	42
	West Vancouver	November 7, 2012, 4:00 – 7:00 p.m.	49
	Bowen Island	November 10, 2012, 2:30 – 4:30 p.m.	46
	East Vancouver	November 13, 2012, 5:00 – 8:00 p.m.	27
	Downtown Vancouver	November 15, 2012, 5:00 – 8:00 p.m.	88
	West Point Grey	November 17, 2012, 5:00 – 8:00 p.m.	139
BC Coastal	Nanaimo	December 4, 2012, 5:00 – 8:00 p.m.	157
	Greater Victoria	December 5, 2012, 5:00 – 8:00 p.m.	180
	West Shore	December 6, 2012, 5:00 – 8:00 p.m.	49
	Saanich Peninsula	December 8, 2012, 1:00 – 3:00 p.m.	101
	Sooke	January 11, 2013, 5:30 – 7:30 p.m.	9
	Salt Spring Island	January 12, 2013, 1:00 – 3:00 p.m.	179

### *Session Format*

Public information sessions were structured as drop-in events where members of the public were invited to attend, obtain information and ask questions about the project. Project information was displayed on storyboards positioned throughout the venue. Technical experts and project team members were on hand to answer questions and receive comments and concerns from attendees.

At each public information session, there were optional sign-in sheets available for attendees to record their name, address and email address, and to indicate whether they wanted to receive project updates by email. Total attendance counts were based on a headcount taken at the door and reflect both the participants who signed in and those who chose not to.

The following print materials were made available to attendees at the public information sessions:

- a project discussion guide containing a description of the project and copies of the displayed storyboards
- the June 2012 Project Update Newsletter
- the September 2012 Project Update Newsletter
- the June 2012 Field Studies Newsletter
- a brochure describing Kinder Morgan's operations in Canada
- ESA fact sheets describing the ESA studies

Over the course of the 37 public information sessions, about 2,500 discussion guides were distributed. An additional 326 digital copies of the discussion guides were downloaded from the project website.

To supplement print materials provided, paper maps of the entire existing route were provided at the meetings. A Google Earth overlay displayed on computers was also provided to allow attendees to zoom in on any portion of the existing route. In some communities, Trans Mountain videos entitled *Pipelines and Parks* and *Journey of a Tanker* were also displayed.

In addition to materials produced by the project team, materials produced by the Canadian Energy Pipeline Association regarding the Canadian pipeline industry and the NEB publication, *Pipeline Regulation in Canada: A Guide for Landowners and the Public* were made available at these sessions.

In response to feedback gathered in Phase 1 at public information sessions in coastal areas (e.g., communities in Burrard Inlet, the Gulf Islands and Vancouver Island regions), representatives from Trans Mountain's marine partner organizations were present at the sessions to provide information and answer questions about their operations. Representatives of the organizations present included:

- the PMV
- WCMRC
- the PPA
- BC Coast Pilots Ltd.
- Seaspan or SMIT
- Harbour Towage

Representatives set up booths and displays at the public information sessions that were visually distinct from those of the Trans Mountain project team and information materials. Marine partner organizations were not in attendance to support or endorse the project, but rather to provide information regarding vessel movements through the Salish Sea and Burrard Inlet, and their individual roles and responsibilities.



### *Feedback Forms*

Attendees at the information sessions were provided with feedback forms and were encouraged to provide completed feedback forms to the project representatives. If attendees chose to provide completed feedback forms later, they were encouraged to provide these forms by mail, email, facsimile or through the digital engagement portal on the Trans Mountain website.

The feedback form used during Phase 2 was designed to collect participants' feedback on:

- quality and completeness of information provided during Phase 2 of engagement
- topics where more information is necessary
- topics of particular interest or concern
- important topics for the environmental assessment
- important topics for the socio-economic assessment
- preferred communication methods for project information

The digital version of the feedback form was available on the project website between October 19, 2012, and January 14, 2013. Translated versions were available for download from the project website in French, Chinese and Punjabi. Over the course of the 37 public information sessions, 250 feedback forms were submitted, 197 in hard copy and 53 digitally.

### *Follow-Up*

After holding information sessions at each location, the project team issued a follow-up notice to all attendees, distributed by mail or email, thanking them for participating and encouraging them to complete and return a feedback form, if they had not already done so.

### **Digital Engagement Opportunities**

As a complement to the public information sessions, Trans Mountain launched a digital engagement program on the Trans Mountain website, which included:

- detailed project information
- the communication materials provided at the information sessions
- regional online engagement forums designed to mirror the public information sessions by allowing stakeholders to review the information available from these sessions and provide feedback either by submitting questions, participating in discussion forums (see Table 5-5) or completing a digital feedback form
- links to various social media outlets and websites that provide information about the project and where to locate information about the project

During Phase 2, activity on the online engagement forum included:

- 45 questions submitted
- 7 comments made in the discussion forums with more than 1,000 views
- 53 digital feedback forms submitted

Trans Mountain has undertaken initiatives to build awareness of digital engagement opportunities, including:

- publishing the project website address and Twitter handle on all print materials
- mailing post cards to all major municipalities and residents along the pipeline and marine corridors providing information about the Trans Mountain website and the online engagement forum

- developing a digital advertising campaign to create awareness of the Trans Mountain website and online engagement forum

Trans Mountain will continue to seek opportunities to build awareness of the digital engagement platform throughout the project’s development.

**Table 5-5: Discussion Forum Topics and Posting Times**

Discussion Topic	Global Page	Alberta Central West	BC Interior	BC Fraser Valley	BC Lower Mainland	BC Coastal Region
As part of the application, we will be assessing the marine impact of the project for both increased tanker traffic and the new marine facilities. What do you think are the most important aspects to study and why? (e.g., impacts to marine life, fate and effect).						Nov 6
How could Trans Mountain create a positive environmental legacy in British Columbia and Alberta?	Nov 15					
Tanker traffic will increase with the proposed project. Are you comfortable with the safety precautions and regulations that are in place for the current tanker traffic in Port Metro Vancouver? Why or why not?						Nov 6
What are some of the considerations we should understand when developing the route through your community?		Sept 21	Oct 22	Nov 15		
What are some of the considerations we should understand when developing the detailed route from Edmonton (Strathcona County) to Burnaby?	Nov 15				Nov 6	
What are your ideas for ways that Trans Mountain could leave a positive legacy in your community?		Sept 21	Oct 22	Nov 15		
What are your ideas for ways that Trans Mountain could leave a positive legacy as a result of this project?					Nov 6	
What do you see as the role for clean technology in Trans Mountain operations or those of the Port?						Nov 6
What do you think are the necessary safety precautions needed for the proposed expansion project?	Nov 15					
What local benefits would be most valuable to you?	Nov 15					
When you consider the ESA, what are the areas that you feel should be given the highest priority in your community and why?		Sept 21	Oct 22	Nov 15	Nov 6	
Do you have any additional comments or suggestions?	Nov 15	Sept 21	Oct 22	Nov 15	Nov 6	Nov 6

**Other Engagement Activities**

Throughout Phase 2, the project team continued to meet with stakeholders and government representatives along the pipeline and marine corridors, and from October 2012 to January 2013 held:

- 45 meetings with municipal governments
- 25 meetings with federal government representatives
- 34 meetings with provincial government representatives

- 165 meetings with other organizations, including local interest groups, chambers of commerce and ENGOs

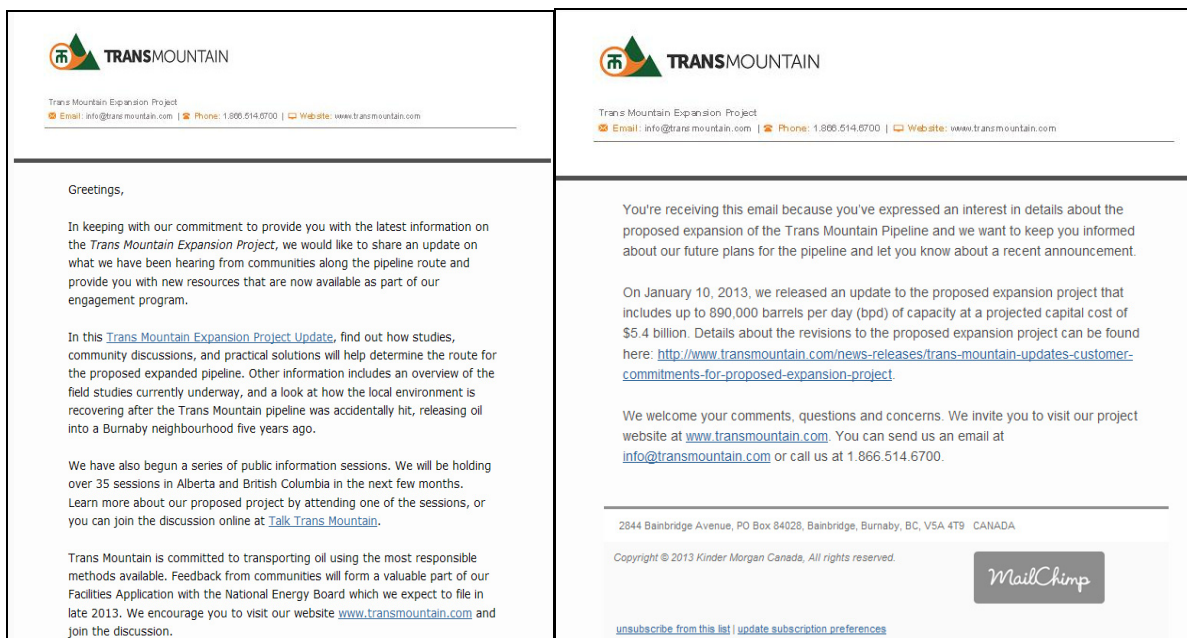
In addition to the meetings being held, the project team has also undertaken a number of workshops with key municipalities to understand issues and work towards solutions that are best suited for the project and the municipality.

### Communications

As part of a commitment to keep stakeholders informed of project activities, Trans Mountain has continued to provide project updates, maintain an active website, phone line and email address. During Phase 2, Trans Mountain joined social media networks with the launch of a project Twitter channel.

The following updates were released during Phase 2 to stakeholders who requested to receive updates (see Figure 5-2):

- project update sent on October 25, 2012
- scope update sent on January 10, 2013



**Figure 5-2: Sample Project Update (Right) and Sample Scope Update (Left)**

Materials provided in the updates were also made available on the project website. Between October 1, 2012, and January 14, 2013, the project website received 17,645 visits, increasing the total number of website visits to almost 22,500.

In Phase 2 stakeholders and interested parties were able to continue to send email to [info@transmountain.com](mailto:info@transmountain.com) through the website or their own email service. They could also reach the Trans Mountain project team by phone through a toll-free line. Between October 1, 2012, and January 14, 2013, 228 emails were received by the Trans Mountain project email address and the toll-free project line received 64 phone calls.

During Phase 2, Trans Mountain joined social media networks with the launch of a project Twitter channel. The project Twitter channel is used to:

- distribute messages about the project
- correct misinformation
- drive traffic to the website

- promote the information sessions and online engagement tools

As new materials are posted to the website, this content is added to the tweet rotation to ensure that followers are aware of the new material. The Twitter channel, @TransMtn, is also used to retweet relevant materials and to distribute media coverage about the project. Between October 2012 and January 2013, 489 tweets were sent by @TransMtn of which 350 were retweeted to new audiences. As of January 14, 2013, the @TransMtn Twitter channel had 299 followers.

### 5.1.2.3 *Engagement Phase 3 (February to July 2013)*

Phase 3 is currently in progress and covers the engagement activities conducted between February 2013 and the filing of the Project Description. The remaining activities planned for Phase 3 are described in Section 5.3: Upcoming Engagement Activities.

Phase 3 engagement activities have been arranged based on the pipeline communities (i.e., those potentially directly affected by the proposed pipeline and related facilities) and marine communities (i.e., those potentially affected by the incremental increase in tanker traffic arising from the proposed project). This division has been made in response to feedback received during the early stages of engagement regarding community interests and needs. Engagement opportunities for pipeline route communities will be offered in Alberta (Edmonton to Jasper), the BC Interior (Valemount to Hope) and the Lower Mainland (Chilliwack to Burnaby). Engagement opportunities for marine corridor communities will be offered in the Lower Mainland (primarily Burnaby), Burrard Inlet communities (Greater Vancouver area, excluding Surrey, Langley, Port Kells and Burnaby, which are part of the pipeline communities) and island communities (Vancouver Island and the Gulf Islands).

#### **Goals**

The goals for engagement Phase 3 are:

- continue to share accurate and timely project information
- seek meaningful input from stakeholders on the proposed approach for undertaking the ESA and Transport Canada's Technical Review Process of Marine Terminal Systems and Transshipment Sites (TERMPOL) assessment
- share information about the marine studies and seek stakeholder feedback
- seek meaningful input from affected stakeholders on proposed route alternatives in areas where it is likely that the route will deviate from the existing Trans Mountain right-of-way
- seek input from local stakeholders on potential project impacts and mitigation measures

#### **Approach**

The engagement activities in Phase 3 will include:

- continued stakeholder outreach
- ESA approach workshops
- community interest workshops
- marine workshops
- public information sessions focused on routing in some communities

#### **ESA Approach Workshops**

The focus of the ESA workshops held in March 2013 was to present a proposed approach to the completion of the project ESA and to seek input from stakeholders regarding the study approach, methodology and regions.

Regional ESA workshops were held in early March in Edmonton, Kamloops and Surrey. The workshops targeted local and regional subject matter experts from municipal, federal and provincial governments, local ENGOs and other interest groups. The project team provided attendees with a proposed overview of the ESA approach for the project and sought the feedback of attendees on particular modules of the ESA, including air, land and water. Input was solicited online for two weeks after each workshop. Feedback received at these sessions was shared with the relevant project team environmental disciplines and will be considered in setting the scope and methodologies for the project ESA.

### Workshop Materials

In addition to the pre-session reading materials circulated to attendees before the workshop, participants were provided with the following materials at each workshop:

- presentations on:
  - the project introduction
  - an ESA overview
  - a land module that explained the scope and approach to assessing land-based elements in the ESA
  - a water module that explained the scope and approach to assessing water-based elements in the ESA
  - an air module that explained the scope and approach to assessing air elements in the ESA
  - an accidents and malfunctions module that explained the scope and approach to the accidents and malfunctions section of the ESA
- a binder of materials, including:
  - workshop guidelines and expectations
  - a travel expenses reimbursement form
  - an honorarium form
  - an ESA workshop presentation
  - supplemental wildlife handout with updated indicators
  - ESA feedback sheets
  - a workshop exit survey
  - online portal login information

### Online Workshop Portals

All workshop materials were also made available online through three ESA workshop portals that were set up to support each regional session. Access to these portals was provided to session attendees and invitees who were unable to attend the workshop sessions. Table 5-6 provides the usage statistics for these portals.

**Table 5-6: Usage Statistics for ESA Online Workshop Portals**

Region	Participants Registered	Site Visits	Document Downloads
Alberta	9	52	17
BC Interior	7	31	4
Fraser Valley and Lower Mainland	13	44	58

**ESA Workshop – Edmonton**

On March 4, 2013, Trans Mountain held an ESA workshop for selected participants in Edmonton. Potentially interested stakeholders were contacted by phone and email and invited to participate.

Attendees included representatives from federal and regional regulatory agencies, one municipality, local ENGOs, and stewardship groups (see Table 5-7).

**Table 5-7: Edmonton ESA Workshop Participants**

Organizations	
Alberta Lake Management Society	City of Edmonton
Alberta Environment and Sustainable Resource Development	Trout Unlimited
Alberta Native Plant Council	West Central Airshed Society
North Saskatchewan Riverkeeper	Parks Canada

**ESA Workshop – Kamloops**

Between February 17 and February 28, 2013, the engagement team sent invitations by phone and email to solicit participation in an ESA workshop on March 6 in Kamloops.

Attendees consisted of representatives from federal and regional regulatory agencies, local ENGOs and one municipality (see Table 5-8).

**Table 5-8: Kamloops ESA Workshop Participants**

Organizations	
BC Lake Stewardship Society	BC Ministry of Mines
City of Kamloops	BC Ministry of Forests, Lands Natural Resource Operations
BC Parks	Fraser Basin Council
BC Grassland Council	Southern Interior Weed Management Committee
Interior Health	Thompson Rivers University

**ESA Workshop – Surrey**

Potentially interested stakeholders were contacted by phone and email and invited to participate an ESA workshop on March 7, 2013, in Surrey.

The primary interests discussed at the workshop included the impact of new legislation on the project, surface and groundwater flow, and the impacts of climate change on the proposed project. Attendees consisted of representatives from federal and regional regulatory agencies, municipalities, local ENGOs and stewardship groups (see Table 5-9).

**Table 5-9: Surrey ESA Workshop Participants**

Organizations	
Abbotsford Soil Conservation Association	Oiled Wildlife Society of BC
Adamah Consultants	Steelhead Society
BC Nature, Burke Mountain Naturalists	Fraser Valley Regional District
BC Parks	City of Surrey
Fraser Valley Watershed Society	City of Abbotsford
Stoney Creek Environmental Committee	Township of Langley
Metro Vancouver	Wildlife Rescue Association
City of Coquitlam	University of Victoria/Stewardship Centre of BC
Environment Canada	Stoney Creek Environmental Committee
Eagle Creek Streamkeepers	Metro Vancouver Regional District

## 5.2 Key Comments and Concerns Phase 2

Phase 2 of the engagement program encompassed a variety of activities to make the project accessible to stakeholders with a wide range of preferences and interests. Feedback to date has been received from the following sources:

- 37 public information sessions attended by a total of about 2,200 attendees
- 58 stakeholder meetings
- 85 interviews carried out with newspapers, magazines, radio stations and TV broadcasters
- 52 comments and questions posted on the project website's online engagement portal
- 250 feedback forms
- 292 inquiries to the project phone line and email address

Table 5-10 summarizes the consultation feedback received by key topic of interest or concern. Based on that feedback from all sources during Phase 1 and 2, the top areas of interest or concern among stakeholders are:

- marine tankers
- socio-economic benefits and impacts – particularly employment and business opportunities
- pipeline safety
- pipeline routing
- spills and emergency response
- stakeholder and aboriginal engagement

Stakeholder feedback from electronic communication was similar to that received during the public sessions. The topics most commonly discussed through the online questions, discussion forum and feedback form tools were:

- employment opportunities
- product details and destination
- project benefits – particularly at the community level
- routing and facility specifics
- spill risk, prevention and response

The topics most commonly discussed during Phase 2 from the 228 emails received by the Trans Mountain project email address and 64 phone calls to the toll-free project line were:

- business opportunities– inquires and offers regarding pipeline equipment and materials, contracting bids, and web optimization
- environmental impact – potential construction impacts to the environment and wildlife
- pipeline safety and emergency response – pipeline integrity, safety checks
- project support – positive feedback regarding Trans Mountain's history and current expansion proposal
- public information sessions – format of the open houses, locations, dates, where to find the Discussion Guide and Feedback Form on the project website
- routing – proposed expansion route, potential impacts on landowners' property, potential impacts of construction on communities and neighbourhoods

**Table 5-10: Interests or Concerns**

Key Topic of Interest or Concern	Comment Summary
Anchor Loop Project and Trans Mountain history	<ul style="list-style-type: none"> <li>• positive feedback on the Anchor Loop Project</li> </ul>
	<ul style="list-style-type: none"> <li>• landowners feel they have been treated well by Trans Mountain</li> </ul>
	<ul style="list-style-type: none"> <li>• positive historical relationships with company and appreciation of how business has been conducted over the years</li> </ul>
Bitumen	<ul style="list-style-type: none"> <li>• properties of bitumen and diluted bitumen, including corrosiveness</li> </ul>
	<ul style="list-style-type: none"> <li>• possibility that bitumen will sink in the event of a marine spill</li> </ul>
	<ul style="list-style-type: none"> <li>• ability to clean up spilled bitumen and diluted bitumen</li> </ul>
	<ul style="list-style-type: none"> <li>• human health impacts related to spilled bitumen and diluted bitumen</li> </ul>
	<ul style="list-style-type: none"> <li>• possibility to refine more products in Alberta so that diluted bitumen and bitumen don't need to be transported by tankers</li> </ul>
	<ul style="list-style-type: none"> <li>• possibility for a bitumen research facility at BC Institute of Technology</li> </ul>
Corporate policy	<ul style="list-style-type: none"> <li>• stance on upstream issues, greenhouse gas (GHG) emissions and climate change</li> </ul>
	<ul style="list-style-type: none"> <li>• export of unrefined product</li> </ul>
	<ul style="list-style-type: none"> <li>• product destination</li> </ul>
	<ul style="list-style-type: none"> <li>• support of Chinese growth</li> </ul>
	<ul style="list-style-type: none"> <li>• corporate wealth and capitalist structures</li> </ul>
	<ul style="list-style-type: none"> <li>• US ownership and Enron connections</li> </ul>
	<ul style="list-style-type: none"> <li>• Kinder Morgan's corporate ethics</li> </ul>
	<ul style="list-style-type: none"> <li>• investment in sustainable energy</li> <li>• reduction in oil consumption and fossil fuel dependence</li> </ul>
Emergency response	<ul style="list-style-type: none"> <li>• response times and protocols</li> </ul>
	<ul style="list-style-type: none"> <li>• location of response crews and equipment</li> </ul>
	<ul style="list-style-type: none"> <li>• grading and drainage of pump station sites</li> </ul>
	<ul style="list-style-type: none"> <li>• leak detection</li> </ul>
	<ul style="list-style-type: none"> <li>• cleanup equipment and methods</li> </ul>
	<ul style="list-style-type: none"> <li>• pipeline valves</li> </ul>
	<ul style="list-style-type: none"> <li>• responsibility for spill response costs</li> </ul>
	<ul style="list-style-type: none"> <li>• spill response in waterbodies and in parks</li> </ul>
	<ul style="list-style-type: none"> <li>• modelling of spill dispersion</li> </ul>
	<ul style="list-style-type: none"> <li>• spill response scenarios in residential areas</li> </ul>
Emergency response and disaster planning	<ul style="list-style-type: none"> <li>• risk of large spills</li> </ul>
	<ul style="list-style-type: none"> <li>• spill response process</li> </ul>
	<ul style="list-style-type: none"> <li>• emergency response capacity of WCMRC and KMC</li> </ul>
	<ul style="list-style-type: none"> <li>• time frame for leak detection (especially for small leaks below pressure detection)</li> </ul>
	<ul style="list-style-type: none"> <li>• spill modelling</li> </ul>
	<ul style="list-style-type: none"> <li>• Kinder Morgan's spill record (e.g., 2009 and 2012 spills)</li> </ul>
	<ul style="list-style-type: none"> <li>• slow spill response after the Westridge Marine Terminal incident</li> </ul>
	<ul style="list-style-type: none"> <li>• improvements to Kinder Morgan's spill response program</li> </ul>
	<ul style="list-style-type: none"> <li>• compensation after spills</li> </ul>



**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Emergency response and disaster planning (cont'd)	• planning for earthquakes and seismic events
	• seismic assessment of Sumas Mountain facilities
	• emergency planning for an explosion at the tank farm
	• valve locations
	• valve operation process and closure time frame
	• properties of bitumen and diluted bitumen
	• cleanup process for bitumen
	• potential for a “Kalamazoo” type spill
	• countering misinformation about the risks of heavy oils
	• evacuation plan for Forest Grove (school)
	• insurance to cover the cost of an oil spill
	• liability for oil spills
Employment and training opportunities	• training opportunities
	• employment and business opportunities during construction
	• timing of construction activities
	• long-term employment opportunities
Human and environmental health	• risk of carcinogenic effects from products in pipeline
	• health impacts of airborne chemicals
	• proximity of pipeline to schools
	• potential for bitumen to sink in water
	• leakage from tankers
	• potential negative impacts to lakes, rivers, fish-bearing streams, groundwater and drinking water sources (e.g., Kakawa Lake and the natural spring nearby)
• modelling of spill movement through soil and percolation into groundwater	
Local socio-economic benefits and impacts	• Trans Mountain grants for communities
	• municipal tax increases
	• economic benefits resulting from construction activities
	• economic impacts in the event of a spill
	• overlap with other projects and cumulative effects
	• impacts to outdoor recreation and tourism
	• training programs and opportunities
	• jobs during construction period
	• permanent operations jobs
	• location of jobs
	• location of construction spreads
	• timing of construction
	• skills training for Aboriginal workers, cooperation with Aboriginal employment organizations
	• use of infrastructure and services by construction crews (e.g., roads, hotels, food services)

**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Local socio-economic benefits and impacts (cont'd)	• utility crossings
	• residential areas
	• agricultural and resource extraction land uses
	• contracts for construction period
	• vendor opportunities
	• investment in community culture and recreation initiatives
	• awareness and mitigation of potential social issues with influx of workers into communities
Marine spills	• potential impact of spill on biodiversity of Fraser Delta ecosystem and Burrard Inlet
	• increased risk of spill with increased tanker traffic
	• providing perspective through the evaluation of spill risk in context of other risks
	• methods of reducing the risk of a spill
	• implications of the closure of the CCG Kitsilano operation, worst-case spill scenario
	• impacts of a spill of bitumen versus refined products
	• proportion of product that can be cleaned up following a spill
	• environmental impact of a spill in Vancouver Harbour
	• Exxon Valdez as an example of the longevity of environmental effects
	• impacts of a spill on human health and quality of life in coastal areas
	• carcinogenic effects of products
	• threat to the regenerated herring fishery and newly returned resident whale populations
	• work with the community to address concerns about oil spill impacts
	• liability for marine spills
	• ability to recover costs from responsible parties
	• cleanup costs that will be paid by taxpayers
	• increase in spill response capacity to cover increase in tanker traffic
	• risk of a spill
	• increased risk with increased volumes of oil
	• spill response times
	• WCMRC equipment locations and response capacity
	• proportion of product that could be cleaned up in the event of a spill
	• liability regime in Canada in the event of a spill
	• transboundary responsibilities
	• adequacy of \$1.3 billion insurance to cover the costs of a spill
	• ability to collect insurance from responsible parties
• impacts to coastline in the event of a spill	
• protection of the fragile marine environment	
• fate and effects behaviour of spilled products	

**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Marine tankers	<ul style="list-style-type: none"> <li>• tanker sizes</li> </ul>
	<ul style="list-style-type: none"> <li>• responsibility for cleanup and costs in the event of a spill from a tanker</li> </ul>
	<ul style="list-style-type: none"> <li>• increase in number of tankers in Burrard Inlet</li> </ul>
	<ul style="list-style-type: none"> <li>• dredging of Second Narrows</li> </ul>
	<ul style="list-style-type: none"> <li>• impacts of tanker traffic on pleasure craft use</li> </ul>
	<ul style="list-style-type: none"> <li>• tug boat escorts and tanker pilotage</li> </ul>
	<ul style="list-style-type: none"> <li>• tanker size and volume</li> </ul>
	<ul style="list-style-type: none"> <li>• storage of oil onboard tankers</li> </ul>
	<ul style="list-style-type: none"> <li>• safety features, such as a double hull</li> </ul>
	<ul style="list-style-type: none"> <li>• tanker navigation in harbour and through narrows</li> </ul>
	<ul style="list-style-type: none"> <li>• tanker navigation in shipping lanes through the Gulf Islands</li> </ul>
	<ul style="list-style-type: none"> <li>• BC Institute of Technology training facility for tanker pilots</li> </ul>
	<ul style="list-style-type: none"> <li>• process for loading tankers and potential for small spills</li> </ul>
	<ul style="list-style-type: none"> <li>• ability of Vancouver Harbour to safely accommodate more tankers</li> </ul>
	<ul style="list-style-type: none"> <li>• increased risk of spill due to increased number of tankers</li> </ul>
	<ul style="list-style-type: none"> <li>• improvements to tanker design, construction and operation</li> </ul>
	<ul style="list-style-type: none"> <li>• investment in clean technology, and research and development to improve tankers</li> </ul>
	<ul style="list-style-type: none"> <li>• sonar to detect whales and deter them from coming near vessels</li> </ul>
	<ul style="list-style-type: none"> <li>• inspections of tankers before loading</li> </ul>
	<ul style="list-style-type: none"> <li>• records to show each tanker's safety history</li> </ul>
	<ul style="list-style-type: none"> <li>• KMC's involvement in tanker safety and spill prevention</li> </ul>
	<ul style="list-style-type: none"> <li>• tugboat escorts in Burrard Inlet and at Saturna Island</li> </ul>
	<ul style="list-style-type: none"> <li>• need to alleviate concerns about the impacts of tanker traffic on pleasure craft use</li> </ul>
	<ul style="list-style-type: none"> <li>• comparison of the number of tankers travelling south to Puget Sound and the number going to Burrard Inlet after the proposed expansion</li> </ul>
	<ul style="list-style-type: none"> <li>• comparison of Canadian and US tanker management</li> </ul>
	<ul style="list-style-type: none"> <li>• dredging of Burrard Inlet (i.e., is it necessary, whose decision would it be?)</li> </ul>
	<ul style="list-style-type: none"> <li>• possibility for tanker size to increase if dredging occurs in the future, and the ability of KMC to influence this</li> </ul>
	<ul style="list-style-type: none"> <li>• impacts of dredging on tides and on West Vancouver's shoreline near Ambleside</li> </ul>
	<ul style="list-style-type: none"> <li>• tanker volumes and numbers</li> </ul>
	<ul style="list-style-type: none"> <li>• safety of tanker design and operation</li> </ul>
<ul style="list-style-type: none"> <li>• double hull construction</li> </ul>	
<ul style="list-style-type: none"> <li>• adequacy of existing shipping lanes to accommodate increase in tanker traffic</li> </ul>	
<ul style="list-style-type: none"> <li>• potential for unsafe conditions in harbour as a result of increased tanker traffic</li> </ul>	
<ul style="list-style-type: none"> <li>• pilotage of tankers and escort tugboats</li> </ul>	

**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Marine tankers (cont'd)	<ul style="list-style-type: none"> <li>• impact of increased tanker traffic on orca populations</li> </ul>
NEB regulatory process	<ul style="list-style-type: none"> <li>• time frame for application to NEB and regulatory review process</li> </ul>
	<ul style="list-style-type: none"> <li>• NEB requirements for the facilities application</li> </ul>
	<ul style="list-style-type: none"> <li>• release of the entire ESA stakeholder review</li> </ul>
	<ul style="list-style-type: none"> <li>• consideration of upstream and downstream climate impacts in NEB review of application</li> </ul>
	<ul style="list-style-type: none"> <li>• influence of public opinion on ultimate decision</li> </ul>
	<ul style="list-style-type: none"> <li>• need for public approval of study area, in addition to NEB approval</li> </ul>
	<ul style="list-style-type: none"> <li>• implications of new legislation for this project</li> </ul>
	<ul style="list-style-type: none"> <li>• influence of the Harper government on the NEB review and project approval</li> </ul>
	<ul style="list-style-type: none"> <li>• environmental assessment</li> </ul>
Nuisance	<ul style="list-style-type: none"> <li>• noise and light from tankers at anchor</li> </ul>
	<ul style="list-style-type: none"> <li>• aesthetic impacts around Westridge Marine Terminal</li> </ul>
	<ul style="list-style-type: none"> <li>• odours from tank farm</li> </ul>
	<ul style="list-style-type: none"> <li>• odours and sickness from Sumas spill in January 2012</li> </ul>
	<ul style="list-style-type: none"> <li>• vibrations caused during pipeline construction</li> </ul>
Pipeline safety	<ul style="list-style-type: none"> <li>• condition of the existing pipeline</li> </ul>
	<ul style="list-style-type: none"> <li>• pipeline life expectancy</li> </ul>
	<ul style="list-style-type: none"> <li>• pipeline materials and coating</li> </ul>
	<ul style="list-style-type: none"> <li>• materials to be used for new pipeline</li> </ul>
	<ul style="list-style-type: none"> <li>• origin of materials (i.e., an aversion to products from China)</li> </ul>
	<ul style="list-style-type: none"> <li>• pipeline monitoring and maintenance program (e.g., smart pigs, digs for repairs or replacements)</li> </ul>
	<ul style="list-style-type: none"> <li>• main causes of spills</li> </ul>
	<ul style="list-style-type: none"> <li>• potential for spills</li> </ul>
	<ul style="list-style-type: none"> <li>• safety measures in place to reduce risk of spills</li> </ul>
	<ul style="list-style-type: none"> <li>• lifespan of a pipe and integrity of the existing pipeline</li> </ul>
	<ul style="list-style-type: none"> <li>• adherence of existing pipe to modern specifications</li> </ul>
	<ul style="list-style-type: none"> <li>• thickness and strength of pipe</li> </ul>
	<ul style="list-style-type: none"> <li>• origin of materials (i.e., a preference for local products)</li> </ul>
	<ul style="list-style-type: none"> <li>• operating and maximum pressure of the pipeline</li> </ul>
	<ul style="list-style-type: none"> <li>• pipeline inspection frequency</li> </ul>
	<ul style="list-style-type: none"> <li>• cleaning the inside of the pipeline</li> </ul>
	<ul style="list-style-type: none"> <li>• use of smart pigs</li> </ul>
	<ul style="list-style-type: none"> <li>• risks to pipeline integrity (e.g., landslides, earthquakes, blasting at nearby quarries)</li> </ul>
	<ul style="list-style-type: none"> <li>• seismic design criteria for the pipeline and facilities, maximum magnitude of a seismic event they are built to withstand</li> </ul>
	<ul style="list-style-type: none"> <li>• containment measures at valve locations</li> </ul>
<ul style="list-style-type: none"> <li>• prevention of incidents</li> </ul>	
<ul style="list-style-type: none"> <li>• positive landowner experiences with digs for pipeline repairs</li> </ul>	

**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Pipeline safety (cont'd)	<ul style="list-style-type: none"> <li>• risks of transporting diluted bitumen</li> </ul>
Routing	<ul style="list-style-type: none"> <li>• existing routing through residential areas and private property</li> <li>• potential reroutes</li> <li>• routing through recreational areas and facilities</li> <li>• proximity to schools and hospitals</li> <li>• utility crossings</li> <li>• routing across or near wetlands, aquifers, lakes, streams and private wells</li> <li>• routing across roads and intersections</li> <li>• property rights, land use and compensation for landowners</li> <li>• municipal land use and development plans</li> <li>• tree removal and vegetation management along existing and new rights-of-way</li> <li>• location of valve sites (existing and new)</li> <li>• specific landowner interests regarding routing on their properties</li> <li>• routing through the North Thompson Provincial Park and other provincial parks</li> <li>• routing through Weyerhaeuser subdivision in Clearwater</li> <li>• raft river crossings</li> <li>• right-of-way width and tree removal</li> <li>• proportion of Line 1 on Crown land</li> <li>• routing near Jacko Lake and Ajax Mine</li> <li>• routing and access road locations relative to the Lac du Bois Grasslands Protected Area expansion in Kamloops</li> <li>• mineral and forestry rights on lands crossed by pipeline</li> <li>• location of Line 1 and the proposed Line 2</li> <li>• impacts to landscaping along edge of right-of-way</li> <li>• impacts to community recreation areas on existing right-of-way</li> <li>• road crossings (e.g., Barnet Highway, Duthie Avenue)</li> <li>• potential to route Line 2 along existing utility and infrastructure corridors (e.g., Loughheed Highway, sanitary line along King Road)</li> <li>• routing through Forest Grove</li> <li>• routing through Centennial School grounds</li> <li>• routing through golf course in Abbotsford</li> <li>• landowner satisfaction with process so far</li> <li>• landowner and resident concerns about routing through private property</li> <li>• landowner compensation and expropriation</li> <li>• routing through the Coquihalla Valley and crossings of the Coquihalla River</li> <li>• crossing of Vedder River</li> <li>• Fraser Valley aquifer</li> </ul>

**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Socio-economic benefits and impacts	<ul style="list-style-type: none"> <li>• availability of insurance for landowners against an oil spill</li> </ul>
	<ul style="list-style-type: none"> <li>• responsibility for cleanup costs in the event of a spill</li> </ul>
	<ul style="list-style-type: none"> <li>• landowner compensation</li> </ul>
	<ul style="list-style-type: none"> <li>• awareness of positive benefits of the project</li> </ul>
	<ul style="list-style-type: none"> <li>• implications of expansion for Chevron refinery</li> </ul>
	<ul style="list-style-type: none"> <li>• support for Chevron refinery, and for refining oil products in Canada</li> </ul>
	<ul style="list-style-type: none"> <li>• need for Chevron to receive enough supply</li> </ul>
	<ul style="list-style-type: none"> <li>• potential decreases in property values and marketability of houses near terminal</li> </ul>
	<ul style="list-style-type: none"> <li>• increases in municipal taxes</li> </ul>
	<ul style="list-style-type: none"> <li>• benefits to Canada as a whole and to communities and municipalities along the route (e.g., Hope)</li> </ul>
	<ul style="list-style-type: none"> <li>• Trans Mountain investment in community infrastructure and facilities</li> </ul>
	<ul style="list-style-type: none"> <li>• enjoyment of existing right-of-way as recreational green space</li> </ul>
	<ul style="list-style-type: none"> <li>• use of local materials during construction</li> </ul>
	<ul style="list-style-type: none"> <li>• lack of long-term jobs as a result of this project</li> </ul>
	<ul style="list-style-type: none"> <li>• effect of proposed expansion on local gas prices</li> </ul>
	<ul style="list-style-type: none"> <li>• desire for a more detailed breakdown of economic figures, and a better explanation of what these numbers mean</li> </ul>
	<ul style="list-style-type: none"> <li>• a comparison of the need for oil export with the risks to the environment and Vancouver's coastal way of life</li> </ul>
	<ul style="list-style-type: none"> <li>• local benefits don't seem to outweigh local risks</li> </ul>
	<ul style="list-style-type: none"> <li>• benefits for non-pipeline communities</li> </ul>
	<ul style="list-style-type: none"> <li>• potential financial impact of a worst-case spill, and the adequacy of \$1.3 billion to cover this impact</li> </ul>
	<ul style="list-style-type: none"> <li>• risk that taxpayers may have to cover some of the costs associated with a spill</li> </ul>
	<ul style="list-style-type: none"> <li>• KMC collaboration with trade schools and high schools regarding skills development and equipment funding</li> </ul>
	<ul style="list-style-type: none"> <li>• opportunities for more collaboration with BC Institute of Technology (e.g., bitumen research facility)</li> </ul>
	<ul style="list-style-type: none"> <li>• employment and training opportunities for First Nations and youth</li> </ul>
	<ul style="list-style-type: none"> <li>• benefits for Aboriginal people living along the pipeline</li> </ul>
	<ul style="list-style-type: none"> <li>• employment and training for local workforces</li> </ul>
	<ul style="list-style-type: none"> <li>• increasing the number of jobs available in British Columbia</li> </ul>
	<ul style="list-style-type: none"> <li>• potential for more safety-related jobs in Vancouver Harbour</li> </ul>
	<ul style="list-style-type: none"> <li>• investment in local clean technology companies and local clean energy companies</li> </ul>
	<ul style="list-style-type: none"> <li>• Trans Mountain investment in local initiatives, such as herring and bird population restoration projects</li> </ul>
<ul style="list-style-type: none"> <li>• use of the right-of-way as a recreational trail</li> </ul>	
<ul style="list-style-type: none"> <li>• impact of the pipeline expansion on local fuel prices</li> </ul>	

**Table 5-10: Interests or Concerns (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Stakeholder and Aboriginal engagement processes	<ul style="list-style-type: none"> <li>• positive reviews of Trans Mountain's process so far, provided that there is more face to face consultation to come</li> </ul>
	<ul style="list-style-type: none"> <li>• concern that engagement is really just public relations</li> </ul>
	<ul style="list-style-type: none"> <li>• need for meaningful engagement</li> </ul>
	<ul style="list-style-type: none"> <li>• preference for different formats, such as forums or panel discussions where attendees could ask questions in front of an audience</li> </ul>
	<ul style="list-style-type: none"> <li>• communication of risk assessment results to the public</li> </ul>
	<ul style="list-style-type: none"> <li>• release of ESA results for public review</li> </ul>
	<ul style="list-style-type: none"> <li>• format for engagement reporting and communication of results to communities</li> </ul>
	<ul style="list-style-type: none"> <li>• stakeholder involvement in the emergency response plans for local shorelines</li> </ul>
	<ul style="list-style-type: none"> <li>• Trans Mountain sponsorship of local events could enhance engagement</li> </ul>
	<ul style="list-style-type: none"> <li>• engagement of upstream producers and downstream shippers</li> </ul>
	<ul style="list-style-type: none"> <li>• distinction between Trans Mountain's engagement process and that undertaken by the NEB during regulatory review</li> </ul>
	<ul style="list-style-type: none"> <li>• regulatory requirements for Trans Mountain's engagement program</li> </ul>
	<ul style="list-style-type: none"> <li>• Aboriginal engagement program and progress so far</li> </ul>
Stakeholder engagement	<ul style="list-style-type: none"> <li>• lack of advertising for the event</li> </ul>
	<ul style="list-style-type: none"> <li>• format of information sessions not conducive to proper dialogue</li> </ul>
	<ul style="list-style-type: none"> <li>• preference for a town hall format</li> </ul>
	<ul style="list-style-type: none"> <li>• preference for a panel of experts, to whom questions could be posed</li> </ul>
	<ul style="list-style-type: none"> <li>• expectation for further full information sessions further west to Sooke</li> </ul>
	<ul style="list-style-type: none"> <li>• involvement of the public in the risk analysis on water</li> </ul>
	<ul style="list-style-type: none"> <li>• structure of feedback form and desire for weighting system to address value statement questions</li> </ul>
Water quality	<ul style="list-style-type: none"> <li>• potential effects of spills on freshwater environments</li> </ul>
	<ul style="list-style-type: none"> <li>• potential environmental effects on streams and lakes from construction</li> </ul>
	<ul style="list-style-type: none"> <li>• potential effects on water-based recreation and tourism</li> </ul>
	<ul style="list-style-type: none"> <li>• precautions taken to protect streams and lakes (e.g., valves)</li> </ul>
	<ul style="list-style-type: none"> <li>• private wells and aquifers</li> </ul>
	<ul style="list-style-type: none"> <li>• construction across or along waterbodies</li> </ul>
	<ul style="list-style-type: none"> <li>• maintenance of water quality in waterbodies along pipeline</li> </ul>

### 5.3 Key Comments and Concerns Phase 3

Table 5-11 summarizes the discussions and feedback from the ESA workshops. The top areas of interest or concern among participants were:

- air emissions (greenhouse gas)
- forest health and timber
- water quality and quantity
- rare plants and communities
- wetlands
- visual impact (reclamation)

**Table 5-11: Key Comments and Concerns Phase 3**

Key Topic of Interest or Concern	Comment Summary
Air emissions(greenhouse gas)	<ul style="list-style-type: none"> <li>• Consider crystalline silica dust and radiologicals as indicators.</li> <li>• Consider impacts through all of the Fraser Valley. It will be important to consider the cumulative air quality impacts of the marine and land-based assessments.</li> </ul>
Air emissions, forest health and timber	<ul style="list-style-type: none"> <li>• Consider burn techniques of forest materials removed by construction.</li> </ul>
Water quality and quantity	<ul style="list-style-type: none"> <li>• Break out of surface and water quality.</li> <li>• Consider benthic invertebrates as indicators.</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>• Consider increasing local study area for wetlands.</li> </ul>
Forest health and timber	<ul style="list-style-type: none"> <li>• Break out grassland and forested area.</li> </ul>
Rare plants and communities	<ul style="list-style-type: none"> <li>• Consider cottonwood riparian habitats as a plant community.</li> <li>• Consider grassland ants or damselflies as indicators.</li> </ul>
Visual impact (reclamation)	<ul style="list-style-type: none"> <li>• Consider visual impact in grasslands (if vegetation regrowth doesn't blend or have the same texture, it is not visually pleasing). It is important that the aesthetic value be considered.</li> </ul>
New legislation	<ul style="list-style-type: none"> <li>• An assessment that goes above the standards set by the new legislation would bode well with the public.</li> </ul>
Climate change (impacts on project)	<ul style="list-style-type: none"> <li>• Consider how increased flooding and erosion will impact pipeline safety and access for maintenance.</li> </ul>
Study areas	<ul style="list-style-type: none"> <li>• Make sure that study areas for water quality, fish, wetlands, soils, physical environment reflect surface and groundwater flow patterns – rather than just assigning study distances.</li> </ul>
Fish species	<ul style="list-style-type: none"> <li>• Consider forage species and sport fish (i.e., sockeye, nooksack dace and coastal cutthroat).</li> </ul>
Wildlife species	<ul style="list-style-type: none"> <li>• Lynx should be back on the list, marbled and ancient murrelets.</li> </ul>
Edge species	<ul style="list-style-type: none"> <li>• Edge species should be considered carefully – although the project may not affect their core habitat, the edge populations can be critical to species survival.</li> </ul>
Local knowledge	<ul style="list-style-type: none"> <li>• Aboriginal traditional knowledge is listed as a study method – local community knowledge should be added.</li> </ul>
Urban versus rural	<ul style="list-style-type: none"> <li>• Would like assurance that commitments and efforts are the same in rural and wilderness areas as they are in urban areas – even though feedback will be skewed to urban areas.</li> </ul>
Impact offsets	<ul style="list-style-type: none"> <li>• Would like to see acknowledgement that there will be impacts, and commitment to investing in the community and local environment to offset these impacts.</li> </ul>



**Table 5-11: Key Comments and Concerns Phase 3 (cont'd)**

Key Topic of Interest or Concern	Comment Summary
Access points	<ul style="list-style-type: none"> <li>• Would like to see concerns and monitoring related to access points identified in a report.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>• Consider adding food production as a condition or key issue for the assessment of soil productivity.</li> </ul>
Geology	<ul style="list-style-type: none"> <li>• Consider the connectivity of geology when assessing potential impacts to rock-dwelling species (particularly with respect to blasting impacts), and when assessing risk of mineral seepage via groundwater into ground and surface waterbodies.</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>• Gradual degradation if we always use the existing condition as a baseline. Consider looking at habitat potential as a baseline rather than just current conditions.</li> </ul>
Reclamation (revegetation)	<ul style="list-style-type: none"> <li>• Weed introduction is a big concern. Want to see proper handling of soils, revegetation with native species and monitoring.</li> </ul>

#### **5.4 Upcoming Engagement Activities**

Trans Mountain will continue engagement activities through to the post-construction phase of the project.

##### **5.4.1 Phase 3: Community Conversations (February – July 2013)**

The remaining engagement activities in Phase 3 include:

- community interest workshops (ongoing – July 2013)
- selected public information sessions on routing (ongoing – July 2013)
- marine studies workshops (ongoing - July 2013)
- continued stakeholder outreach (ongoing)

##### **5.4.2 Phase 4: Sharing Preliminary Results (Fall 2013)**

The goals of this phase are:

- share the results of the environmental field studies and preliminary proposed mitigation measures with stakeholders
- seek input from stakeholders on the proposed mitigation measures to be outlined in ESA
- provide further details to the public regarding project plans before filing the application with the NEB

A project Newsletter Update #4 and a public report on the results of Phase 3 engagement activities will be released during this phase. Engagement activities likely to be undertaken in Phase 4 include:

- a series of public information sessions along the project corridor
- a series of workshops regarding ESA study findings and seeking input into proposed mitigation measures
- ongoing meetings with interested parties
- continuation of digital engagement portals

##### **5.4.3 Phase 5: Continued Engagement (Late 2013 – throughout construction)**

Additional engagement phases will be developed to support the regulatory process and, if successful, the construction phases of the project. The goals of these engagement phases will be to:

- share results of any new studies or work being done on the project
- communicate any changes to project plans
- share information with stakeholders on the regulatory process and help stakeholders understand opportunities to have input into the regulatory process
- engage on construction impacts and mitigation measures
- communicating about the benefits of the project to local stakeholders, engaging on environment offsets and explaining the regulatory process and next steps

## 5.5 Consultations with Landowners

For over 60 years, Trans Mountain has had an ongoing relationship with landowners with land straddling or adjacent to the existing pipeline. These landowners make up a key interest group for the project. Trans Mountain appreciates that its relationship with landowners can affect its ability to obtain regulatory approval for the project and to meet planning and construction schedules throughout the project. Therefore, the goal of the project landowner consultation program is to maintain a good working relationship with each landowner throughout all phases of the project and into operations.

Based on the existing Trans Mountain database of land ownership along the existing pipeline route, there are about 2,300 private landowners, 600 in Alberta and 1,700 in British Columbia. In addition, there are about 260 Crown parcels in Alberta and 400 in British Columbia. Trans Mountain's philosophy in dealing with each landowner concerning land-related matters is based on the concepts of fairness, equity, integrity and mutual respect. Trans Mountain understands that, with regard to the project, how the project is introduced to landowners and the success of ongoing communication, issue identification and resolution are critical to maintaining a good working relationship with landowners. Therefore, obtaining landowner acceptance and approval for survey, construction, restoration and transition to operation activities, by means of open communication, fair compensation and addressing non-monetary issues in a respectful manner, offers the greatest likelihood of success in the short and the long term to negotiate mutually agreeable arrangements with each landowner.

To that end, communication with landowners regarding the project began in April 2012. In addition to being included in the general stakeholder engagement program, specific communications were initiated with landowners, which included:

- A letter to 2,300 private landowners informing them that Trans Mountain was proposing to expand the existing pipeline system and referring them to the project and NEB websites for further information on the project.
- Hand delivered letters to urban residents along the Trans Mountain pipeline right-of-way in Edmonton and the Lower Mainland in August 2012. The letter was in response to concerns from urban residents that Trans Mountain was considering expanding the pipeline corridor through residential areas. The letter informed the residents that Trans Mountain intended to pursue alternative routing in their communities.

Starting in the summer of 2012, land agents began contacting landowners along the existing pipeline route and provided them with copies of the June 2012 Project Update Brochure, the Field Studies Brochure and a copy of the NEB publication, *Pipeline Regulation in Canada: A Guide for Landowners and the Public*. Land agents were also provided with land survey consent forms and requested the landowner's consent before survey crews entered onto the their land, even though the TMPL system easements and the *NEB Act* provides Trans Mountain the right to access lands to complete surveys for the project.

To assist in the assessment of potential pipeline alignments for Line 2, land agents have been contacting landowners of property or persons with Crown rights with land that lies within a 150 m wide survey corridor centred on Line 1. Crown rights holders along the existing pipeline route are being contacted in the same manner as private landholders. To date, land agents acting on behalf of Trans Mountain have contacted about 850 landowners and Crown rights holders in Alberta and 2,350 in British Columbia. Most of the landowners contacted have provided either a written or verbal consent to a survey.

This direct contact approach enables land agents to provide information to landowners in person about the project and proposed studies. It also provides landowners and Crown occupants an opportunity to ask questions and identify concerns about the project or the existing pipeline. These questions and concerns are passed on to the project team and, in return, answers or additional information is provided to the landowner during follow-up visits and discussions with land agents. Legacy issues stemming from existing and past operations are forwarded to the TMPL operation staff for action.

In Alberta, questions and concerns raised by landowners to date include:

- proximity of residences to the pipeline
- legacy issues, including concerns over reclamation of lands affected by maintenance work, materials left on lands following maintenance work
- compensation for survey consent
- pipeline safety and integrity
- concerns about multiple pipelines on properties
- concerns about potential effects on future development

In British Columbia, in addition to the concerns raised by Alberta landowners, landowners have raised concerns over global issues, such as:

- oil refining in Canada
- how the Line 2 might affect future development plans
- delays in getting Trans Mountain's approval for landowner developments
- opposition in principle to oil pipelines and oil exports
- the legality of the existing easement
- compensation for the original easement
- scepticism about Trans Mountain's motives in asking for survey permission

Communication with landowners will continue throughout the NEB application process and their questions, issues and concerns will be gathered and incorporated into the NEB application. As routing studies advance in areas where engineering, environmental and urban constraints exist, landowners and Crown rights holders along potential alternative routes will be identified and contacted in the same manner as the landowners along the existing route.

## **5.6 Government Consultations**

The project team has initiated discussions with government agencies that have an interest in the project, such as:

- agencies with service areas that might be affected by the project
- agencies that possess information needed by Trans Mountain to prepare the NEB application

The team will continue to engage these agencies through to the post-construction phase of the project. Regulatory consultation activities conducted to date include project introduction mail-outs and project introduction meetings.

On June 16, 2012, a project introductory package was sent to relevant agencies. The package included a project introduction letter, a copy of the June 2012 Project Update Newsletter and the Field Studies Brochure. Additional government agencies that will likely need to be approached for information to inform project studies were also included in this mail-out. Table 5-12 lists the regulatory agencies and government offices that received a copy of the project introduction package. Trans Mountain will continue to engage regulatory agencies and government offices that have interest in the project through to the post-construction phase of the project.

**Table 5-12: Distribution of the Project Introductory Package to Government**

<b>Alberta</b>	<b>British Columbia</b>	<b>Federal</b>
Alberta Office of the Premier	British Columbia Office of the Premier	Office of the Prime Minister
Alberta Agriculture and Rural Development	BC Ministry of Aboriginal Relations and Reconciliation	Environment Canada
Alberta Culture	BC Ministry of Agriculture and Lands	Department of Fisheries and Oceans
Alberta Education	BC Agricultural Land Commission	Foreign Affairs and International Trade
Alberta Energy	BC Ministry of Energy and Mines	Health Canada
Alberta Environment and Sustainable Resource Development	BC Ministry of the Environment	Industry Canada
Alberta Health	BC Ministry of Finance	NEB
Alberta Human Services	BC Ministry of Forests, Lands and Natural Resource Operations	Natural Resources Canada
Alberta Tourism, Parks and Recreation	BC Ministry of Jobs, Tourism and Innovation	Parks Canada Agency
Alberta Transportation	BC Ministry of Transportation and Infrastructure	Statistics Canada
Alberta Treasury Board and Finance	BC Oil and Gas Commission	Transport Canada

## **6.0 POTENTIAL ENVIRONMENTAL AND SOCIO-ECONOMIC INTERACTIONS AND EFFECTS OF THE PROJECT**

With almost 60 years experience, Trans Mountain has considerable knowledge of the environmental characteristics of the various landscapes and marine environments within which the existing system operates. The types of landscapes that will be encountered by the project include:

- agricultural (i.e., cultivated fields, tame pastures and hay lands)
- grasslands
- forests
- mountains
- industrial and urban
- waterbodies and watercourses, such as wetlands, drainages, creeks and rivers

Many of these landscapes support a diverse assemblage of vegetation, wildlife and aquatic species, including potential habitat for species of conservation concern. Such landscape diversity results in a wide range of land and natural resource use along the project corridor, including:

- farming and ranching
- forestry
- oil and gas
- commercial
- mineral extraction
- hunting, trapping, guiding and other outdoor recreational activities
- rural and urban development
- Aboriginal traditional land use

Similarly, the marine environments near the Westridge Marine Terminal and in Burrard Inlet support:

- fish, mammals and birds
- commercial, recreational and tourism use
- marine industry
- Aboriginal marine resource use

The preliminary potential environmental and socio-economic interactions (e.g., elements) and potential effects (e.g., key issues) identified by the project for consideration in the ESA are listed in:

- Table 6-1, Pipelines and Facilities – Preliminary Potential Environmental Interactions and Effects
- Table 6-2, Pipelines and Facilities – Preliminary Potential Human Interactions and Effects
- Table 6-3, Marine Transportation – Preliminary Potential Environmental Interactions and Effects
- Table 6-4, Marine Transportation – Preliminary Potential Human Interactions and Effects

This information is based on experience operating the TMPL system, stakeholder consultation, including Aboriginal and public engagement, and regulatory and governmental consultation to date, and the requirements of the NEB's *Filing Manual*. The tables list the proposed indicators, sometimes called valued ecosystem components or valued social components, the rationale for selection and the associated potential effects of accidents and malfunctions that might be expected.

Trans Mountain expects that this list will be refined as stakeholder consultation and Aboriginal engagement for the project continues.

**Table 6-1: Pipelines and Facilities – Preliminary Potential Environmental Interactions and Effects**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
<b>Terrestrial and Aquatic Environment</b>		
Acoustic environment	<ul style="list-style-type: none"> <li>• increased noise during pipeline construction in urban areas, pump additions, pump station construction, tank installation and expansion of the Westridge Marine Terminal</li> <li>• increased noise during operation of pump stations, tank farms and the Westridge Marine Terminal</li> <li>• vibrations during pipeline construction</li> <li>• noise impact on wildlife as evaluated under the Wildlife and Wildlife Habitat element</li> </ul>	The following indicators for the acoustic environment are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• sound levels</li> <li>• vibrations</li> </ul>
Accidents and malfunctions	<ul style="list-style-type: none"> <li>• effects of accidental fire</li> <li>• effects of accidental damage to foreign utilities</li> <li>• effects of accidental release of instream drilling mud</li> <li>• effects of traffic accidents</li> <li>• effects of accidental spills and spill response</li> </ul>	See the key indicators previously described in Tables 6-1 and 6-2 for biophysical and socio-economic elements, including marine elements.
Air emissions	<ul style="list-style-type: none"> <li>• criteria air contaminants during construction</li> <li>• cumulative increase in criteria air contaminants and fugitive storage tank emissions during operations</li> <li>• odours from tank terminal operations</li> <li>• regional air shed air quality (Lower Fraser)</li> </ul>	The following indicators for air emissions are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• primary emissions associated with storage tanks of volatile organic compounds (VOCs), benzene, toluene, ethylbenzene and xylene (BTEX) and combustion products like criteria air contaminants (e.g., sulphur dioxide [SO<sub>2</sub>], oxides of nitrogen [NO<sub>x</sub>], carbon monoxide [CO], particulate matter [such as PM<sub>2.5</sub>, PM<sub>10</sub>])</li> <li>• secondary smog-related products, like ozone and PM<sub>2.5</sub> that can form in the atmosphere from project emissions of NO<sub>x</sub> and VOCs</li> <li>• hydrogen sulphide (H<sub>2</sub>S) and mercaptans emissions which have the potential to cause nuisance odours</li> <li>• fugitive emissions from pump stations</li> </ul>
Fish and fish habitat	<ul style="list-style-type: none"> <li>• loss or alteration of fish habitat</li> <li>• cumulative loss of fish habitat</li> <li>• increased access for harvesters</li> </ul>	The following indicators for fish and fish habitat are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• instream habitat – valuable sport, commercial and subsistence fishery</li> <li>• riparian habitat - indicates watershed integrity and existing disturbance</li> <li>• fish mortality or injury – potential for mortality or injury during construction or through increased access</li> <li>• indicator species selected include federal or provincial species of special concern or species of recreational, commercial and cultural significance that are geographically distributed throughout the project:</li> </ul>

**Table 6-1: Pipelines and Facilities – Preliminary Potential Environmental Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
<b>Terrestrial and Aquatic Environment (cont'd)</b>		
Fish and fish habitat (cont'd)		<ul style="list-style-type: none"> <li>○ AB: bull trout, Arctic grayling, Athabasca rainbow, northern pike, walleye, burbot and lake sturgeon</li> <li>○ BC: bull trout/Dolly Varden, chinook, coho, cutthroat, rainbow/steelhead and nooksack dace</li> </ul>
GHG emissions	<ul style="list-style-type: none"> <li>● increased GHG concentrations in the atmosphere</li> </ul>	The following indicators during construction and operations activities are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>● common GHGs, such as methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>) and nitrous oxide (N<sub>2</sub>O)</li> <li>● effect of the project on climate change</li> </ul>
Physical and meteorological environment	<ul style="list-style-type: none"> <li>● terrain instability</li> <li>● alteration of topography</li> <li>● changes to the project caused by the environment, such as severe weather, flooding and changing weather trends</li> </ul>	The following indicators for the physical and meteorological environment are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>● terrain instability</li> <li>● topographic change</li> <li>● acid generating rock</li> </ul>
Soil and soil productivity	<ul style="list-style-type: none"> <li>● decreased soil productivity</li> <li>● clubroot introduction</li> <li>● compaction and rutting</li> <li>● wind and water erosion</li> <li>● hydrostatic test water discharge</li> <li>● bedrock and stone disposal issues</li> <li>● soil contamination</li> </ul>	The following indicators for soil and soil productivity are proposed since they influence soil productivity and are requirements of the NEB's <i>Filing Manual</i> : <ul style="list-style-type: none"> <li>● soil productivity</li> <li>● soil degradation</li> <li>● bedrock and stone disposal</li> <li>● soil contamination</li> </ul>
Species at risk	<ul style="list-style-type: none"> <li>● fish species of special concern</li> <li>● vegetation species of special concern (<i>Species at Risk Act</i> [SARA] plant species are not presently anticipated to be affected by the project)</li> <li>● wildlife species of special concern</li> </ul>	See the fish and fish habitat, vegetation and wildlife and wildlife habitat elements of this table.
Vegetation	<ul style="list-style-type: none"> <li>● loss or alteration of vegetation communities of concern</li> <li>● loss or alteration of plant or lichen species of concern populations</li> <li>● weed introduction and spread</li> </ul>	The following indicators for vegetation are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>● vegetation communities of concern</li> <li>● plant and lichen species of concern</li> <li>● presence of infestations of provincial weed species and other invasive non-native species identified as a concern</li> </ul>
Water quality and quantity	<ul style="list-style-type: none"> <li>● groundwater use requirements</li> <li>● release of drilling mud into surface water or aquifer formation</li> <li>● release of uncontrollable artesian flows</li> <li>● water quality or quantity changes to nearby groundwater which may result in adverse effects for other stakeholders or environmental receptors</li> <li>● surface water quality and quantity</li> </ul>	The following indicators for water quality and quantity are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>● groundwater quality</li> <li>● groundwater quantity</li> <li>● surface water quality</li> <li>● surface water quantity</li> </ul>

**Table 6-1: Pipelines and Facilities – Preliminary Potential Environmental Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
<b>Terrestrial and Aquatic Environment (cont'd)</b>		
Wetland loss or alteration	<ul style="list-style-type: none"> <li>• net loss of wetlands and wetland habitat</li> <li>• loss or alteration of wetland hydrologic function</li> <li>• loss or alteration of wetland biogeochemical function</li> <li>• loss or alteration of wetland habitat function</li> </ul>	The following indicators for wetland loss or alteration are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• wetland function – baseline wetland function, no net loss requirement of <i>The Federal Policy on Wetland Conservation</i></li> </ul>
Wildlife and wildlife habitat	<ul style="list-style-type: none"> <li>• habitat availability and effectiveness: direct habitat loss (e.g., clearing), indirect habitat loss (e.g., sensory disturbance, edge effects, fragmentation, avoidance/reduced use)</li> <li>• wildlife movement: barriers/filters during construction and operation</li> <li>• wildlife mortality risk: disturbance of occupied breeding, roosting, overwintering habitat, vehicle collisions; changes in predation/hunting pressure</li> </ul>	A combination of wildlife communities by habitat, species groups and individual species comprise the proposed indicators for wildlife and wildlife habitat. The following indicators are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• mammals: grizzly bear, moose, woodland caribou, forest furbearers (American marten, fisher, wolverine), coastal riparian small mammals and bats</li> <li>• birds: grassland/shrub-steppe birds, mature/old forest birds, early seral forest birds, wetland birds, wood warblers, short-eared owl, rusty blackbird, flammulated owl, Lewis' woodpecker, Williamson's sapsucker, western screech-owl, great blue heron, spotted owl, bald eagle, common nighthawk, harlequin duck, northern goshawk and olive-sided flycatcher</li> <li>• reptiles: arid habitat snakes (western rattlesnake)</li> <li>• amphibians: lentic (pond-dwelling) amphibians (western toad, Oregon spotted frog, great basin spadefoot) and lotic (stream-dwelling) amphibians (coastal tailed frog and Pacific giant salamander)</li> </ul>
<b>Marine Environment</b>		
Ecological risk assessment – operational discharges from the Westridge Marine Terminal and pipeline spills	<ul style="list-style-type: none"> <li>• effects on water and water quality</li> <li>• effects on fish, fish eggs and fish habitat</li> <li>• effects on benthic invertebrates and aquatic plants</li> <li>• effects on marine mammals</li> <li>• effects on shorebirds and seabirds</li> <li>• effects on shoreline soils</li> <li>• effects on shoreline vegetation and invertebrates</li> <li>• effects on semi-aquatic and terrestrial birds and mammals</li> </ul>	The following are proposed key indicators for the evaluation of ecological effects from operational releases and emissions from the proposed marine terminal expansion: <ul style="list-style-type: none"> <li>• aquatic community</li> <li>• sediment community</li> <li>• western sandpiper</li> <li>• surf scoter</li> <li>• marbled murrelet</li> <li>• bald eagle</li> <li>• glaucous - winged gull</li> <li>• great blue heron</li> <li>• mink</li> <li>• Steller sea lion</li> <li>• harbour porpoise</li> </ul>



**Table 6-1: Pipelines and Facilities – Preliminary Potential Environmental Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
<b>Marine Environment (cont'd)</b>		
Ecological risk assessment – operational discharges from the Westridge Marine Terminal and pipeline spills (cont'd)		The following are proposed key indicators for the evaluation of ecological effects from accidental release from the pipeline: <ul style="list-style-type: none"> <li>• fish and fish eggs</li> <li>• benthic invertebrates</li> <li>• woodland caribou</li> <li>• grizzly bear</li> <li>• mink/otter</li> <li>• moose</li> <li>• muskrat</li> <li>• meadow vole</li> <li>• masked shrew</li> <li>• little brown bat</li> <li>• terrestrial plants</li> <li>• soil invertebrates</li> <li>• bald eagle</li> <li>• belted kingfisher</li> <li>• Canada goose</li> <li>• great blue heron</li> <li>• mallard duck</li> <li>• western sandpiper</li> <li>• tree swallow</li> </ul> The following are proposed key indicators for the evaluation of ecological effects from accidental release to the Fraser River Estuary: <ul style="list-style-type: none"> <li>• aquatic community</li> <li>• sediment community</li> <li>• biofilm</li> <li>• western sandpiper</li> <li>• surf scoter</li> <li>• marbled murrelet</li> <li>• bald eagle</li> <li>• glaucous - winged gull</li> <li>• great blue heron</li> <li>• mink</li> <li>• Steller sea lion</li> <li>• harbour porpoise</li> </ul>
Marine birds	<ul style="list-style-type: none"> <li>• avoidance of terminal area because of project activities</li> <li>• increased risk of mortality from lighting and infrastructure</li> <li>• habitat availability because of vegetation clearing</li> </ul>	<ul style="list-style-type: none"> <li>• great blue heron – breeding resident, wading bird and species of conservation concern</li> <li>• pelagic cormorant – breeding resident and species of conservation concern</li> <li>• glaucous-wing gull – resident breeder</li> <li>• Barrow's goldeneye – summer visitor and seabird</li> <li>• bald eagle – resident raptor</li> <li>• spotted sandpiper – breeding resident shorebird</li> </ul>

**Table 6-1: Pipelines and Facilities – Preliminary Potential Environmental Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
<b>Marine Environment (cont'd)</b>		
Marine fish and fish habitat	<ul style="list-style-type: none"> <li>• alteration or loss of marine fish habitat from project activities</li> <li>• loss of reproductive capacity of suitable marine fish habitat from project activities</li> <li>• physical injury or mortality of marine fish resulting from project activities</li> </ul>	<ul style="list-style-type: none"> <li>• marine riparian habitat – provides shading and nutrient inputs to the nearshore marine environment</li> <li>• intertidal habitat (includes algae and invertebrates) – used by numerous fish species for rearing, foraging, migrating and/or spawning</li> <li>• subtidal habitat (includes algae and invertebrates) – used by numerous fish species for rearing, foraging, migrating and spawning</li> <li>• Dungeness crab – harvested species is common in the project area</li> <li>• rockfish – harvested species. The Westridge Marine Terminal expansion is within a Rockfish Conservation Area. Some species are of conservation concern.</li> <li>• Pacific salmon (all five species) – harvested species. Spawning rivers present in Burrard Inlet, juveniles use nearshore habitats.</li> </ul>
Marine mammals	<ul style="list-style-type: none"> <li>• behavioural disturbance of marine mammals resulting from underwater noise</li> <li>• injury or mortality of marine mammals resulting from project activities</li> </ul>	<ul style="list-style-type: none"> <li>• harbour seal – common in project area; representative pinniped species</li> </ul>
Marine sediment and water quality	<ul style="list-style-type: none"> <li>• release of total suspended solids, polycyclic aromatic hydrocarbons and metals during dredging for construction of terminal berths</li> <li>• release of total suspended solids, hydrocarbons and metals in surface runoff from the terminal area to Burrard Inlet during operations</li> <li>• effects of bilge water release</li> <li>• effects of ballast water release</li> <li>• other discharges</li> </ul>	<ul style="list-style-type: none"> <li>• selected contaminants that represent bitumen and refined products chemistry in sediment (e.g., light extractable petroleum hydrocarbons, heavy extractable petroleum hydrocarbons, polycyclic aromatic hydrocarbons, BTEX, volatile petroleum hydrocarbons)</li> <li>• selected contaminants that represent water chemistry (e.g., metals, nutrients, total suspended solids, turbidity, salinity, total extractable hydrocarbon)</li> <li>• selected parameters and contaminants that represent sediment chemistry (e.g., metals, sediment particle size, sediment organic carbon, polychlorinated biphenyl)</li> </ul>
Marine species at risk	<ul style="list-style-type: none"> <li>• marine fish, mammal and bird species of special concern</li> </ul>	See the marine fish and fish habitat, marine mammals and marine birds elements of this table.
<p>Note: Indicators as noted are proposed. Indicators might change based on consultation with stakeholders, availability of data and input from other disciplines.</p>		

**Table 6-2: Pipelines and Facilities – Preliminary Potential Human Interactions and Effects**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
Accidents and malfunctions	<ul style="list-style-type: none"> <li>• effects of accidental fire</li> <li>• effects of accidental damage to foreign utilities</li> <li>• effects of accidental release of instream drilling mud</li> <li>• effects of traffic accidents</li> <li>• effects of accidental spills and spill response</li> </ul>	For biophysical and socio-economic elements, including marine elements, see the key indicators described in Table 6-1 and in Table 6-2.
Employment and economy	<ul style="list-style-type: none"> <li>• creation of local, regional, provincial and national employment and income</li> <li>• creation of local, regional, provincial and national procurement/business opportunities</li> <li>• increased local, provincial and federal government revenues</li> <li>• access to training and capacity development opportunities</li> <li>• disruption of some local businesses and industries</li> <li>• disruption to some resource-based livelihoods</li> <li>• access to project employment/procurement opportunities</li> </ul>	The following indicators for employment and economy are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• national and provincial economies</li> <li>• regional employment</li> <li>• municipal economies</li> <li>• contracting and procurement</li> <li>• training and capacity development</li> <li>• business and livelihood disruption</li> </ul>
Heritage resources	<ul style="list-style-type: none"> <li>• direct and indirect effects on archaeological sites</li> <li>• direct and indirect effects on paleontological sites</li> <li>• direct and indirect effects on historic sites</li> </ul>	The following indicators for heritage resources are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• archaeological sites</li> <li>• paleontological sites</li> <li>• historic sites</li> </ul>
Human and community health	<ul style="list-style-type: none"> <li>• social and economic changes leading to effects (adverse or beneficial) on related health outcomes, such as mental well-being, alcohol and drug misuse, violence and injury</li> <li>• effects on infectious disease transmission between project workers and community members</li> <li>• effects on health and well-being related to anxiety around potential contamination</li> <li>• potential increase in traffic-related injuries</li> <li>• capacity and preparedness of emergency health response services</li> <li>• potential demand on health care service providers and facilities</li> <li>• effects on health among Aboriginal peoples</li> <li>• differential health effects among vulnerable subpopulations</li> </ul>	The following indicators for community health are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• socio-economic health effects</li> <li>• infectious diseases</li> <li>• environmental health effects</li> <li>• public safety</li> <li>• health care provision</li> <li>• Aboriginal health</li> </ul>

**Table 6-2: Pipelines and Facilities – Preliminary Potential Human Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
Human health risk assessment (HHRA) – operational discharges from the Westridge Marine Terminal and pipeline spills	<ul style="list-style-type: none"> <li>• effects of routine air emissions from pump stations, tanks and the Westridge Marine Terminal on people’s health</li> <li>• effects of accidental spills on people’s health</li> <li>• effects on subpopulations considered to be particularly vulnerable to chemical exposures, such as infants, children, the elderly, individuals with pre-existing medical conditions, and those residing close to the project facilities</li> <li>• effects on the safety of Aboriginal traditional food supplies, such as wild game, fish, berries and other types of country food</li> </ul>	<p>The following indicators for human health are proposed to fulfill the NEB’s <i>Filing Manual</i> requirements:</p> <ul style="list-style-type: none"> <li>• Aboriginal people</li> <li>• rural residents</li> <li>• urban residents</li> <li>• recreational users</li> </ul>
Human occupancy and resource use	<ul style="list-style-type: none"> <li>• disturbance to parks and protected areas</li> <li>• disturbance to Aboriginal reserves and traditional use areas</li> <li>• disturbance to residential areas or community use areas</li> <li>• disruption to agricultural and grazing activities and farm productivity</li> <li>• disruption of recreational use areas and recreational experiences</li> <li>• disturbance of hunting, trapping, fishing and guiding or commercial/sport-fishing areas</li> <li>• disturbance to managed forest areas, forest health, loss of merchantable timber</li> <li>• disturbance to mineral, aggregate and oil and gas leases</li> <li>• disruption of industrial and commercial areas</li> <li>• disturbance of trails or navigable waters</li> <li>• change in surface or groundwater quality or access used for domestic, commercial, agricultural or recreational purposes</li> <li>• visual and aesthetic disturbance</li> </ul>	<p>The following indicators for human occupancy and resource use are proposed to fulfill the NEB’s <i>Filing Manual</i> requirements:</p> <ul style="list-style-type: none"> <li>• parks and protected areas</li> <li>• Aboriginal reserves and traditional use areas</li> <li>• residential use</li> <li>• agricultural use</li> <li>• outdoor recreation use</li> <li>• other land and resource use</li> <li>• water supply and use</li> <li>• visual attributes</li> <li>• marine commercial, recreational and tourism use</li> </ul>
Infrastructure and services	<ul style="list-style-type: none"> <li>• increased use of regional highways and roads, increased traffic volumes</li> <li>• increased use of other transportation infrastructure (i.e., railway, regional airports, ports)</li> <li>• disturbance to pipelines, water and sewer lines</li> <li>• disturbance of and improvements to power transmission and distribution lines</li> <li>• regional power capacity to meet the needs of the project</li> <li>• increased pressure on local and regional housing and accommodation</li> <li>• increased pressure on health, social, educational, emergency, protective and recreation services</li> </ul>	<p>The following indicators for infrastructure and services are proposed to fulfill the NEB’s <i>Filing Manual</i> requirements:</p> <ul style="list-style-type: none"> <li>• transportation infrastructure</li> <li>• linear infrastructure and power supply</li> <li>• waste and water infrastructure</li> <li>• housing</li> <li>• educational services</li> <li>• emergency, protective and social services</li> <li>• recreation amenities</li> </ul>

**Table 6-2: Pipelines and Facilities – Preliminary Potential Human Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
Infrastructure and services (cont'd)	<ul style="list-style-type: none"> <li>• direct and indirect pressure on regional water and waste infrastructure</li> <li>• need for government expenditures related to new or enhanced infrastructure and services</li> </ul>	
Social and cultural well-being	<ul style="list-style-type: none"> <li>• changes in community demographics because of temporary workers</li> <li>• increased income and economic well-being tied to project-related employment and contracting opportunities</li> <li>• timely access to opportunities and distribution of income at the community and regional level during project construction</li> <li>• social issues related to community-worker interactions and use of income</li> <li>• interference with community events and key community assets</li> <li>• project-related community investment and legacy</li> <li>• effects on Aboriginal culture</li> </ul>	The following indicators for social and cultural well-being are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• population and demographics</li> <li>• income levels and distribution</li> <li>• community way-of-life</li> <li>• Aboriginal culture</li> </ul>
Traditional land and resource use	<ul style="list-style-type: none"> <li>• potential effects on traditional livelihoods and culture from combined project-specific effects on vegetation, wetlands, wildlife and wildlife habitat, fish and fish habitat, and water quality and quantity</li> <li>• potential effects on traditional livelihoods and culture from combined project-specific effects on human occupancy and resource use, heritage resources, social and cultural well-being, human health, infrastructure and services, and employment and economy</li> </ul>	The following indicators for traditional land and resource use are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• traditional land and resource use, including subsistence activities (e.g., hunting, trapping, fishing), subsistence resources, trails, travelways and habitation sites</li> <li>• cultural sites, including gathering places and sacred areas</li> </ul>
Traditional marine resource use	<ul style="list-style-type: none"> <li>• effects of the Westridge Marine Terminal expansion on Aboriginal marine resource use</li> <li>• potential effects on traditional livelihoods and culture from combined project-specific effects on marine resources</li> <li>• potential effects on traditional livelihoods and culture from combined project-specific effects on marine commercial, recreational and tourism use, resource use, marine heritage resources and human health</li> </ul>	The following indicators for traditional marine resource use are proposed to fulfill the NEB's <i>Filing Manual</i> requirements: <ul style="list-style-type: none"> <li>• traditional marine resource use, including subsistence activities (e.g., hunting, fishing), subsistence resources, travelways and harvesting equipment</li> <li>• cultural sites, including gathering places and sacred areas</li> </ul>
Note: Indicators as noted are proposed. Indicators might change based on consultation with stakeholders, availability of data and input from other disciplines.		

**Table 6-3: Marine Transportation – Preliminary Potential Environmental Interactions and Effects**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
Ecological risk assessment (marine transportation spills)	<ul style="list-style-type: none"> <li>• acute and chronic effects on marine communities (fish, invertebrates, sediment, plants, marine mammals and seabirds)</li> <li>• acute and chronic effects on subtidal sediment communities</li> <li>• acute and chronic effects on intertidal communities, including algae, zooplankton, macro-invertebrates, fish, shorebirds, seabirds and, mammals, including cetaceans</li> </ul>	<ul style="list-style-type: none"> <li>• aquatic community receptors (marine plants, invertebrates and fish)</li> <li>• intertidal sediment communities (marine plants, benthic invertebrates, fish)</li> <li>• subtidal sediment communities (marine plants, benthic invertebrates, fish)</li> <li>• black oystercatcher</li> <li>• surf scoter</li> <li>• marbled murrelet</li> <li>• bald eagle</li> <li>• glaucous-winged gull</li> <li>• great blue heron</li> <li>• coastal-dwelling mink</li> <li>• Steller sea lion</li> <li>• harbour porpoise</li> <li>• southern residential killer whale</li> <li>• humpback whale</li> </ul>
Marine air emissions	<ul style="list-style-type: none"> <li>• criteria air contaminants from increased marine vessel traffic</li> <li>• cumulative increase in criteria air contaminants</li> <li>• regional air shed air quality (Lower Fraser)</li> </ul>	<ul style="list-style-type: none"> <li>• criteria air contaminants (i.e., SO<sub>2</sub>, NO<sub>x</sub>, CO, PM<sub>2.5</sub>, PM<sub>10</sub>) – emissions associated with vessels</li> <li>• VOCs, such as BTEX and odours – fugitive emissions associated with vessels</li> <li>• secondary contaminants such as ozone and PM<sub>2.5</sub></li> <li>• visibility</li> </ul>
Marine birds	<ul style="list-style-type: none"> <li>• behaviour alterations or sensory disturbance resulting from visual presence, wake/waves, in-air and underwater noise from project-related vessels</li> <li>• injury or mortality risk from project-related vessel strikes, collisions and lighting</li> </ul>	<ul style="list-style-type: none"> <li>• fork-tailed storm-petrel</li> <li>• Cassin's auklet</li> <li>• surf scoter</li> <li>• pelagic cormorant</li> <li>• glaucous-winged gull</li> </ul>
Marine fish and fish habitat	<ul style="list-style-type: none"> <li>• effects of vessel wake on shoreline habitats</li> </ul>	<ul style="list-style-type: none"> <li>• Pacific salmon (all five species) – valuable sport, commercial, and subsistence fishery. Important food source for marine mammals, use shoreline habitats for rearing and migrating.</li> <li>• Pacific herring – valuable commercial fishery. Important food source for fish and marine mammals, use shoreline habitats for spawning.</li> </ul>
Marine GHG emissions	<ul style="list-style-type: none"> <li>• increased GHG concentration in the atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>• common GHG emissions from increased vessel traffic such as CH<sub>4</sub>, CO<sub>2</sub>, and N<sub>2</sub>O</li> <li>• effect of project-related GHG emissions from oil tanker traffic on climate change</li> </ul>
Marine mammals	<ul style="list-style-type: none"> <li>• sensory disturbance resulting from underwater noise (from tankers and tugs)</li> <li>• physical injury or mortality of marine mammals resulting from increased marine vessel traffic (i.e., risk of vessel strike)</li> </ul>	<ul style="list-style-type: none"> <li>• Steller sea lion – representative pinniped species, species of conservation concern</li> <li>• southern resident killer whale – representative toothed whale, valuable commercially, recreationally and culturally; sensitive to disturbance; critical habitat in the regional study area, species of conservation concern</li> </ul>

**Table 6-3: Marine Transportation – Preliminary Potential Environmental Interactions and Effects (cont'd)**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
Marine mammals (cont'd)		<ul style="list-style-type: none"> <li>• humpback whale — representative baleen whale, valuable commercially and recreationally, species of conservation concern</li> </ul>
Marine noise	<ul style="list-style-type: none"> <li>• Increased above-water noise associated with increased marine vessel traffic</li> </ul>	<ul style="list-style-type: none"> <li>• above-water sound levels</li> </ul>
Marine sediment and water quality	<ul style="list-style-type: none"> <li>• effects of discharge of bilge water</li> <li>• effects of discharge of ballast water</li> <li>• effects of other discharges</li> </ul>	<ul style="list-style-type: none"> <li>• marine water quality</li> </ul>
Marine species at risk	<ul style="list-style-type: none"> <li>• see the marine fish and fish habitat, marine mammal and marine bird elements of this table</li> </ul>	See the marine fish and fish habitat, marine mammal and marine bird elements of this table.
Note: Indicators as noted are proposed. Indicators might change based on consultation with stakeholders, availability of data and input from other disciplines.		

**Table 6-4: Marine Transportation – Preliminary Human Interactions and Effects**

Element (Interaction)	Expected Key Issues (Potential Effects)	Proposed Indicators and Selection Rationale
Accidents and malfunctions	<ul style="list-style-type: none"> <li>effects of accidental spills and spill response</li> </ul>	Key indicators identified for previously described marine elements: <ul style="list-style-type: none"> <li>marine sediment and water quality; marine fish and fish habitat; marine mammals; marine birds, marine species at risk, Aboriginal marine resource use, marine commercial, recreational and tourism use</li> </ul> Additional indicators found outside Burrard Inlet: <ul style="list-style-type: none"> <li>southern resident killer whale – species of conservation concern</li> <li>surf scoter – seabird, species of conservation concern</li> </ul>
HHRA (marine transportation)	<ul style="list-style-type: none"> <li>effects of increased tanker traffic on people’s health</li> <li>effects on the safety of Aboriginal traditional food supplies, including locally-grown and harvested marine foodstuffs</li> </ul>	<ul style="list-style-type: none"> <li>Aboriginal people</li> <li>rural residents</li> <li>urban residents</li> <li>recreational users</li> </ul>
HHRA (marine transportation spills)	<ul style="list-style-type: none"> <li>effects of accidental spills on people’s health</li> <li>effects on the safety of Aboriginal traditional food supplies, including locally-grown and harvested marine foodstuffs</li> </ul>	<ul style="list-style-type: none"> <li>Aboriginal people</li> <li>rural residents</li> <li>urban residents</li> <li>recreational users</li> </ul>
Marine commercial, recreational and tourism use	<ul style="list-style-type: none"> <li>potential effects of additional ship traffic on fish harvest patterns and levels</li> <li>potential effects of additional ship traffic on fishing gear or equipment</li> <li>potential aesthetic effects of additional ship traffic (e.g., noise, light) for marine users</li> <li>potential effects of additional ship traffic on marine mammals/birds key to tourism-based operators (e.g., whale watching)</li> <li>potential effects of additional ship traffic on user access and movement patterns</li> </ul>	<ul style="list-style-type: none"> <li>marine commercial use</li> <li>marine recreational use</li> <li>marine tourism use</li> </ul>
Traditional marine resource use	<ul style="list-style-type: none"> <li>effects of additional ship traffic on harvest patterns and harvest levels</li> <li>potential effects on traditional livelihoods and culture from combined project-specific effects on marine resources</li> <li>potential effects on traditional livelihoods and culture from combined project-specific effects on marine commercial, recreational and tourism use, resource use, marine heritage resources and human health</li> </ul>	<ul style="list-style-type: none"> <li>traditional marine resource use, including subsistence activities (e.g., hunting, fishing), subsistence resources, travelways, harvesting equipment</li> <li>cultural sites, including gathering places, sacred areas</li> </ul>
Note: Indicators as noted are proposed. Indicators might change based on consultation with stakeholders, availability of data and input from other disciplines.		



## 7.0 OTHER REGULATORY REQUIREMENTS

In addition to seeking a certificate under the NEB Act to construct and operate the project, the Trans Mountain Expansion Project could potentially qualify as a designated project defined under the *Canadian Environmental Assessment Act, 2012*. The *Regulations Designating Physical Activities*, Schedule, Section 38, includes provisions for the construction and operation of an oil pipeline more than 75 km in length on a new right-of-way, development of a marine terminal and expansion of an oil storage facility of greater than 500,000 m<sup>3</sup>. At this time, the potential for the Trans Mountain Expansion Project to be a designated project is unclear, however, through development of the project facilities application this will be determined as Trans Mountain carries out routing assessments, landowner consultation, Aboriginal engagement and public consultation.

### 7.1 Federal Authorizations

Trans Mountain will work with various federal agencies with responsibilities related to the project components and impacts. Table 7-1 is a preliminary list of potential federal agency authorizations.

**Table 7-1: Preliminary List of Potential Federal Regulatory Authorizations**

Regulatory Agency	Legislation	Permit/Notification	Activity/Trigger
Canadian Transportation Agency	<i>Railway Relocation and Crossing Act</i>	Crossing Permit	Approval to cross railways with access roads and transmission lines
Environment Canada	<i>Canadian Environmental Protection Act, 1999</i>  <i>Regulations Respecting Applications for Permits for Disposal at Sea</i>	Section 127: Disposal at Sea Permit (previously called Ocean Dumping Permit)	Approval to dispose of materials at sea (e.g., dredge spoil from the Westridge Marine Terminal expansion)
	<i>Species at Risk Act</i>	Permit pursuant to Section 73 of the act – Species at Risk Permit	Activities that affect a listed species, including fish species, its critical habitat or residence
	<i>Migratory Birds Convention Act</i>  <i>Migratory Birds Sanctuary Regulations</i>	Permit for activity	Approval for activity in a migratory bird sanctuary
Aboriginal Affairs and Northern Development Canada	<i>Indian Act</i>	Section 28 Approval to cross an IR	As required, approval for the pipeline and transmission lines to cross reserve lands
	<i>First Nations Land Management Act</i>	Section 20 Approval to cross an IR	As required, approval for the pipeline and transmission lines to cross reserve lands
DFO *	<i>Fisheries Act Section 32(2)</i>	Letter of Advice or Authorization	Authorization required if fish will be destroyed during construction
	<i>Fisheries Act Section 35(2)</i>	Letter of Advice or Authorization	Authorization required if construction will create harmful alteration, disruption or destruction (HADD) or serious harm
	<i>Fisheries Act Section 36</i>	Letter of Advice/Regulation Authorization	Approval/regulation for the deposit of deleterious substances
	Operational Statements	Notification as per the applicable Operational Statements	As required, notifications for watercourse crossings that comply with DFO Operational Statements Marine Communications and Traffic Services oversight of marine traffic within Canadian jurisdiction

**Table 7-1: Preliminary List of Potential Federal Regulatory Authorizations (cont'd)**

Regulatory Agency	Legislation	Permit/Notification	Activity/Trigger
Industry Canada	<i>Radiocommunication Act</i>	Radio Licence	Radio communication
Natural Resources Canada	<i>Explosives Act</i>	Sections 6 and 7: Explosives Transportation Permit	Approval to transport explosives
		Temporary Magazine Licence	Approval for any storage place of explosives in amounts that exceed the regulations. If a factory is required to make explosives near the site, additional permits might be required. Also, additional permits might be required, depending on the type of explosives (e.g., an Ammonium Nitrate Fuel Oil Permission) and whether they are blended.
		Temporary Blaster's Licence or Blaster's Permit	Approval to use explosives
Parks Canada	<i>Canada National Parks Act</i>	Special Activity Permits	Approval to conduct activities, such as valve work
Transport Canada *	<i>Navigable Water Protection Act</i>	Navigable Waters Approval	Approval to construct works in, on, over, under or through a navigable waterway; applies to the Westridge Marine Terminal expansion and crossing of navigable waterways along the pipeline corridor
	<i>Canada Shipping Act</i>	An act respecting shipping and navigation	Ensures compliance of vessels with relevant marine regulations
PMV	<i>Canada Marine Act</i>	Project Permit, Building Permit	Approval for new structures on water or land, including modifications to existing structures
		Water Lease Expansion	
Note *: As a result of the passage of the <i>Jobs, Growth and Long-term Prosperity Act</i> (Bill C-38), regulation requirements of some federal legislation are evolving, and actual triggers and permitting requirements will be confirmed over the next year.			

Figure 7-1 shows the regulatory oversight relating to crude oil transportation for the project.

### 7.1.1 TERMPOL Review

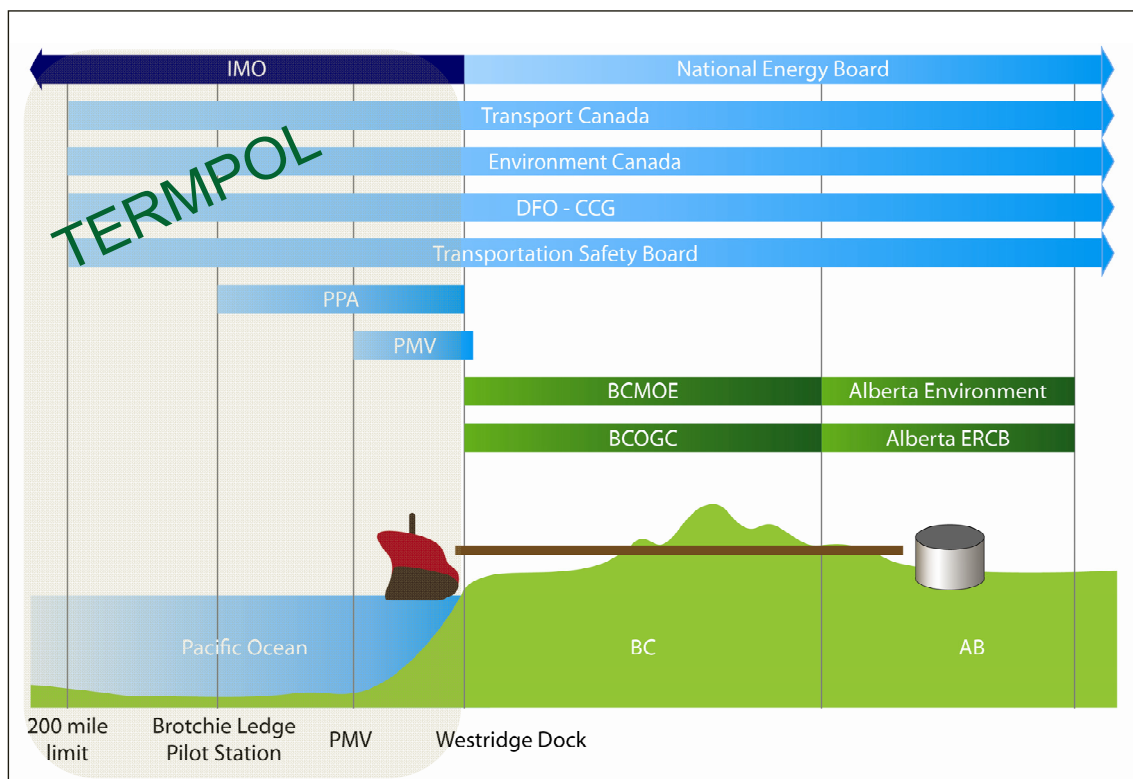
In addition to the federal authorizations, Trans Mountain will participate in Transport Canada's TERMPOL. This is an operational review process led by a federal interdepartmental committee that is tasked with precisely and reliably measuring the navigational risks associated with the location and operation of the marine terminals for large oil tankers. The intent of the TERMPOL is to ameliorate elements of a project proposal that, in certain circumstances, could threaten the integrity of a ship's hull and its cargo containment system and, consequently, the environment near the ship while it is navigating waters under Canadian jurisdiction.

The key areas of concern in the TERMPOL are:

- ship design and operation
- navigational and physical characteristics of the approaches to the terminal
- terminal design and infrastructure

- environmental impact
- risk and accident analysis along the transit route and at the terminal, and the related mitigating measures
- pollution prevention program
- contingency plans

TERMPOL is a voluntary process and does not relieve Trans Mountain from its obligations to comply with all applicable legislative and regulatory requirements. Trans Mountain intends to include any findings of the review in its expanded operational guidelines and manuals.



**Figure 7-1: Regulatory Oversight for Crude Oil Transportation**

## 7.2 Other Jurisdictions

Trans Mountain is currently working with provincial and municipal agencies to gain an understanding of their expectations for information and permits related to federally regulated projects. Trans Mountain is also engaging Aboriginal groups in developing an understanding of their interests and concerns related to the project.

Furthermore, Trans Mountain has engaged regional districts and municipalities to identify and assess routing alternatives within their boundaries, and to address any questions or concerns related to project activities and facilities within their jurisdictions.

## 8.0 MARINE TRANSPORTATION

Since 1953, Trans Mountain has been operating the Westridge Marine Terminal and providing safe loading capabilities for tankers transporting crude oil to the West Coast and offshore locations.

Marine transportation in Canadian waters is authorized and regulated through the *Canada Shipping Act* and related legislation and regulations administered by Transport Canada and the CCG. Although regulation and authorization of marine transportation is not specifically within the jurisdiction of the NEB, Trans Mountain intends to include in its project application to the NEB an assessment of the environmental and socio-economic effects of marine transportation, and an analysis of the potential for accidents and malfunctions related to marine transportation.

Trans Mountain maintains operating standards and practices for the Westridge Marine Terminal that are part of a managed system for tanker safety within Canadian waters.

Before coming to Canada, tankers are required to meet high standards of design and construction:

- tankers are built according to regulations established by the International Maritime Organization and adopted by their flag state
- ship construction and repairs are inspected and documented by a classification society to ensure construction meets these regulations and specifications
- tankers are built with double hulls and segregated cargo holds to reduce the possibility of cargo spills and to minimize any potential spill volume, if an accident were to occur

On an ongoing basis throughout operations, tankers are:

- inspected by their flag state and by classification societies
- vetted by charterer and insurers
- inspected in other ports of call by other nations, including those that are signatories to the conventions on port state control (a ship inspection program) to which Canada is also a member

Upon coming to Canada, tankers are scrutinized to ensure they are compliant with Canadian and Trans Mountain requirements. These requirements include:

- Vessels proposed by a pipeline shipper to receive a cargo at the Westridge Marine Terminal are pre-screened by the Trans Mountain loading master using industry databases and the company's own records before being accepted for scheduling purposes.
- Section 168 of the *Canada Shipping Act* requires that the ship must have an arrangement with a Transport Canada certified response organization (e.g., WCMRC) for spill response service before entering Canadian waters.
- A vessel must contact the CCG for permission to enter Canadian waters before entry.

Upon arrival in Canadian waters, tankers must follow strict communications and guidance protocols:

- The CCG and US Coast Guard (USCG) monitor ship traffic through the Juan de Fuca Strait and the Salish Sea. Four traffic zones are monitored:
  - Tofino traffic (entrance to Juan de Fuca Strait, CCG)
  - Seattle traffic (Juan de Fuca Strait, USCG)

- Victoria traffic (Salish Sea, CCG)
- Vancouver traffic (Vancouver Harbour, CCG)
- The ship remains in communication with Marine Communications and Traffic Services (MCTS) and the ship's position is monitored throughout the transit. It is handed off between traffic zones as it moves from one to the other. A combination of radar, automatic information system and direct radio communication is used to coordinate safe conduct of the vessel with other masters and pilots. Currently there is no US or Canadian pilotage requirement for transit through the Juan de Fuca Strait.
- The PPA is the federal organization responsible for the administration of the *Pilotage Act* on the West Coast. The BC Coast Pilots Association is the organization that provides service under the *Pilotage Act* and Transport Canada (*Canada Shipping Act, 2001*). All large foreign vessels are required to have a licensed pilot when in local waters. When loaded, tankers are required to have two pilots. The pilot advises the vessel master on safe navigation and is responsible for safe conduct of the vessel while in pilotage waters.
- Empty tankers headed for the Westridge Marine Terminal pick up a pilot at the Victoria pilot station near Brotchie Ledge.
- Under the pilot's guidance, and with supervision from MCTS, the ship navigates through established shipping lanes to the PMV. Ships to and from the Westridge Marine Terminal transit the Juan de Fuca Strait, Haro Strait and Boundary Pass.
- Empty tankers inbound to the Westridge Marine Terminal do not require tug escort. Laden tankers do require tethered tug escort.

When a ship enters into the PMV's jurisdictional area (within line between Point Atkinson and the US border), a series of established operating rules and protocols apply:

- The PMV rules for conduct of shipping within its jurisdictional area, as documented in the *Harbour Operations Manual*.
- The PMV operations assign an anchorage for the vessel based on availability and operational requirements. A vessel may anchor at designated locations in English Bay or designated locations off the Westridge Marine Terminal, depending on timing of tides, the Westridge Marine Terminal loading schedule, and the ships own requirements for provisioning or maintenance. In some cases, the ship might proceed directly to the berth.
- When in port, the cargo owner arranges for an agent to assist the vessel with local logistical requirements and interaction with local authorities.
- Pilots leave the ship when it is at anchor, but are aboard anytime it moves, even if just from anchor to dock or back.
- The ship is inspected by Transport Canada on its first arrival in Canada and once per year after that. This might occur at anchor or alongside the Westridge Marine Terminal. Canada is a signatory to both the Paris and Tokyo memorandums of understanding (MOU), conventions on international coordination of inspection requirements. Canada has adopted the MOU requirements into the *Canada Shipping Act*. Under these MOUs, Transport Canada has access to inspection records from inspections by other signatory jurisdictions and shares Canadian results. Convention entities publish annual reports ranking performance of flag states, which are used as a basis to accept or deny entry of vessels.

When a tanker berths at the Westridge Marine Terminal:

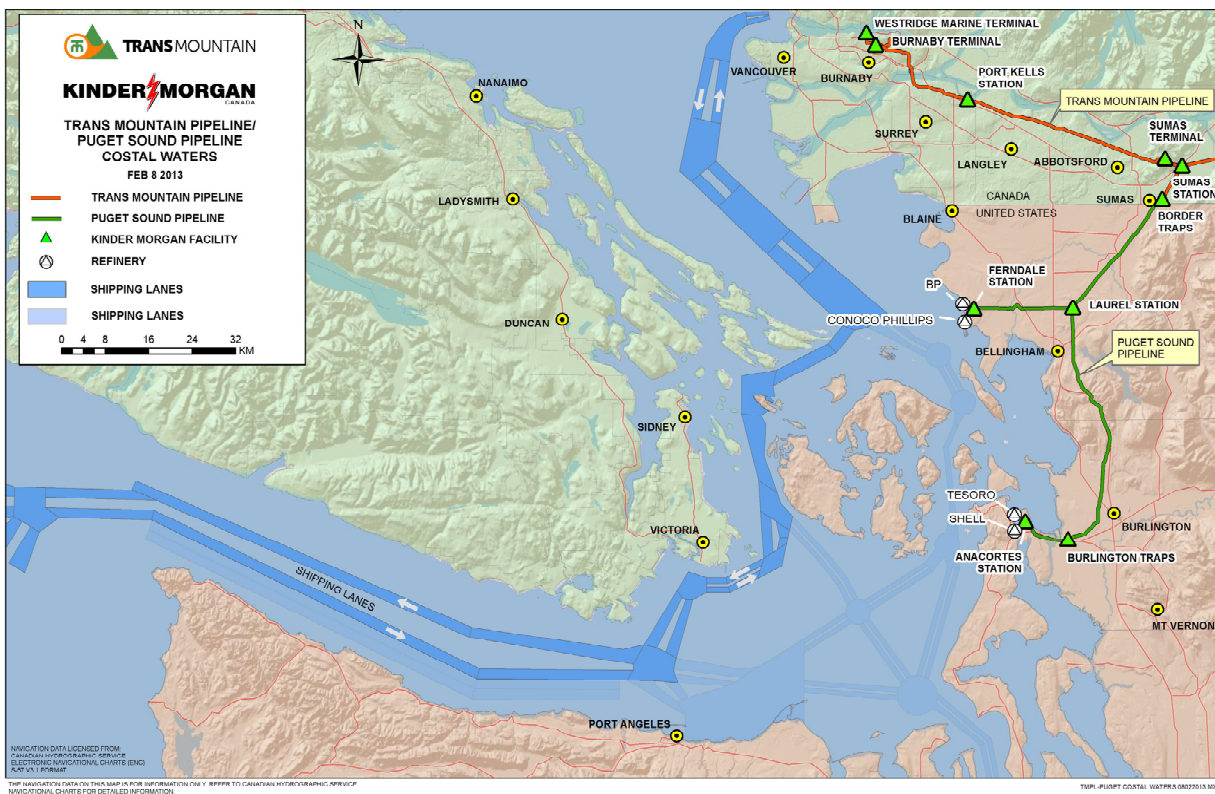
- The ship is assisted by docking tugs and made fast at the Westridge Marine Terminal dock.
- The Trans Mountain loading master boards the vessel to conduct a physical inspection and to conduct a ship-shore safety meeting with the master and terminal operators.
- The loading facility is operated in accordance with regulations established by NEB, Transport Canada and others, as required.
- A boom is deployed to enclose the ship and terminal. A second boom is on hand as a backup in case of emergency. The WCMRC moors a skimming vessel at Trans Mountain's utility dock west of the loading dock.
- Loading arms and vapour recovery lines are connected to the tanker. The Westridge vapour destruction system is started and loading commences. Loading typically takes 24 to 36 hours depending on the size of the vessel.
- The Trans Mountain loading master is on board throughout the process, monitoring the condition of ship and crew. The loading master has the authority to stop the loading process if any concerns arise. The loading master also provides shipside contact for communication with the terminal.
- Terminal operating procedures include an ERP. Terminal staff are trained in emergency response and regular exercises are held to practice these procedures.
- As required by Transport Canada, Trans Mountain has an arrangement with WCMRC for marine spill response services. The WCMRC has spill response equipment staged on the water in Vancouver Harbour and a main base of operations nearby in Burnaby. Similarly, the WCMRC maintains equipment caches on Vancouver Island for response in the Salish Sea.

When loading is complete and the vessel departs:

- The loading master stays on board until pilots come to move the vessel away from the dock.
- The ship is cast off and typically goes to anchorage to wait for tide for the Second Narrows transit, as required by the PMV's *Harbour Operations Manual*.
- Two PPA pilots come aboard to assist the tanker in safely navigating out of Canadian waters. The PPA requires loaded tankers to have two BC Coast Pilots on board, one to ensure safe conduct of the vessel and one to monitor the bridge crew and ships systems.
- The PMV's *Harbour Operations Manual* defines the Second Narrows movement restricted area (MRA) and the rules for MRA transits, including tanker size restrictions and tug escort requirements, and speed restrictions. Only one vessel at a time is allowed in the Second Narrows MRA and First Narrows. The MCTS monitors the tankers progress and other vessels traffic in the harbour.
- Before the transit begins, MCTS declares a clear narrows and the Canadian National Railway is contacted to raise their rail bridge.
- The PMV rules require that two large tugs are tethered to the stern and at least one smaller tug on the bow for the Second Narrows MRA transit. Only the two large tugs tethered to the stern are required for the transit through the remainder of the harbour.

- After clearing the First Narrows, the escort tugs fall away and the ship transits without escort until it approaches East Point on Saturna Island.
- The PPA has established escort requirements for the Salish Sea (Boundary Pass and Haro Strait). The PPA requires a single large tug tethered 1.5 nautical miles before East Point until Race Rocks off Victoria.
- The two onboard BC Pilots disembark at the Victoria Pilot Station (Brotchie Ledge).
- The tugs leave the vessel at Race Rocks as the vessel enters the Juan de Fuca Strait.
- No pilotage or escort is required through the Juan de Fuca Strait. However, as with inbound transits, the tanker and all other traffic are monitored by the MCTS.
- US industry funds a rescue tug at Neah Bay to assist any ships in distress in the Juan de Fuca Strait.
- Upon clearing the Juan de Fuca Strait, the ship continues to its destination.

Figure 8-1 shows the shipping lanes used by tankers transiting Canadian waters, both inbound and outbound to the Westridge Marine Terminal.



**Figure 8-1: Shipping Lanes for Tankers Transiting Canadian Waters**

## GLOSSARY

<b>%</b>	The symbol for percent.
<b>AB</b>	The abbreviation for Alberta.
<b>abandonment</b>	As defined by the NEB <i>Onshore Pipeline Regulations, 1999</i> , abandonment is to permanently cease operation such that the cessation results in the discontinuance of service. Should a pipeline discontinue service, the pipeline would apply under section 74 of the NEB Act for leave to abandon a pipeline or a section of a pipeline. In accordance with the current NEB <i>Filing Manual</i> , the application would require the abandonment to be carried out in a technically safe manner, all potential environmental, socio-economic and financial effects are identified and addressed, and all landowners and other persons potentially affected are sufficiently notified and have their rights protected.
<b>Aboriginal peoples</b>	As defined by the <i>Constitution Act, 1982</i> , section 35, which defines Aboriginal peoples to include the ‘Indian, Inuit and Métis peoples of Canada’.
<b>Aframax and Panamax tanker vessels</b>	A mid-size class of tanker vessel.
<b>agricultural land reserve</b>	Administered by the British Columbia Agricultural Land Commission, the agricultural land reserve is a provincial zone in which agriculture is recognized as the priority use and non-agricultural uses are controlled.
<b>Alberta segment</b>	All project components located in Alberta, inclusive of pipelines and facilities.
<b>bbbl</b>	The abbreviation for barrel and the plural barrels.
<b>bbbl/d</b>	The abbreviation for barrels per day.
<b>BC</b>	The abbreviation for British Columbia.
<b>British Columbia segment</b>	All project components located in British Columbia, inclusive of pipelines and facilities.
<b>BTEX</b>	The abbreviation for benzene, toluene, ethylbenzene and xylene.
<b>Burnaby Terminal</b>	The terminus of the TMPL system in Burnaby, BC. The Burnaby Terminal houses 13 tanks with a total capacity of about 270,400 m <sup>3</sup> (1.7 million bbl) and includes meters, provers, pumps and ancillary facilities. At this terminal, Trans Mountain receives crude oil and refined products for distribution by local pipelines to local terminals, refineries and the Westridge Marine Terminal.
<b>cathodic protection</b>	A system using an impressed current to actively prevent corrosion from occurring on the buried portions of the pipeline that have experienced coating damage.
<b>CCG</b>	The abbreviation for the Canadian Coast Guard.



<b>CH<sub>4</sub></b>	The chemical symbol for methane.
<b>CO</b>	The chemical symbol for carbon monoxide.
<b>CO<sub>2</sub></b>	The chemical symbol for carbon dioxide.
<b>contaminant of potential concern</b>	A contaminant identified through a screening process as part of a health or environmental risk assessment that has been developed for a specific purpose.
<b>corridor (project)</b>	The proposed routing assessment and environmental study area for the project, measuring about 150 m wide and centred on Line 1. In urban areas and at pinch points (e.g., rock outcrops) the corridor can be of a much smaller width. The corridor might also be referred to as a route.
<b>criteria air contaminants</b>	The presence of, and interactions between, a group of pollutants produced from a number of sources, including burning of fossil fuels, that have the potential to result in air quality issues, such as smog and acid rain.
<b>CSA</b>	The abbreviation for the Canadian Standards Association.
<b>dead weight tonnage</b>	A measure of how much weight a ship is carrying or capable of safely carrying.
<b>DFO</b>	The abbreviation for the Department of Fisheries and Oceans Canada.
<b>Edmonton Terminal</b>	The starting point of the TMPL system in Sherwood Park, AB, east of Edmonton. The Edmonton Terminal houses 19 tanks with a total capacity of about 430,400 m <sup>3</sup> (2.7 million bbl) and includes meters, provers, pumps, ancillary facilities, and the main control centre that remotely monitors all aspects of pipeline operations using a sophisticated SCADA system. Currently, the terminal has 20 incoming feeder lines from throughout Alberta.
<b>EHS</b>	The abbreviation for environment, health and safety.
<b>ENGOS</b>	The abbreviation for environmental non-governmental organizations.
<b>environment, health and safety policy</b>	The formalization of Kinder Morgan Canada's commitment to conduct business in a safe and environmentally responsible manner supported through a series of commitments.
<b>environmentally significant area</b>	As defined by Alberta Tourism, Parks and Recreation, these are areas that are identified as being important to the long-term maintenance of biological diversity, soil, water or other natural processes, at multiple spatial scales and/or areas that contain rare or unique elements or that include elements that might require special management consideration because of their conservation needs.
<b>ERP</b>	The abbreviation for Emergency Response Plan.
<b>ESA</b>	The abbreviation for environmental and socio-economic assessment.
<b>GHG</b>	The abbreviation for greenhouse gas.

<b>greenhouse gas</b>	Any of various gases (e.g., carbon dioxide) that contribute to the greenhouse effect.
<b>H<sub>2</sub>S</b>	The chemical symbol for hydrogen sulphide.
<b>ha</b>	The metric symbol for hectare.
<b>HHRA</b>	The abbreviation for human health risk assessment.
<b>hp</b>	The abbreviation for horsepower.
<b>hydrostatic testing</b>	The use of water for pressure testing a pipeline to a pressure of at least 25% greater than the planned operating pressure to expose potential defects or leaks and ensure integrity.
<b>ICS</b>	The abbreviation for incident command system.
<b>ILI</b>	The abbreviation for in-line inspection.
<b>IMP</b>	The abbreviation for integrity management programs.
<b>incident</b>	A specific unplanned event or sequence of events that has an unwanted and unintended effect on people's safety or health, on property or the environment, or on regulatory compliance.
<b>incident command system</b>	Adopted by Trans Mountain as the basic response structure for its emergency response teams. The incident command system is a systematic tool used for the command, control and coordination of emergency response actions.
<b>in-line inspection</b>	Any large number of advanced tools that are deployed inside of a pipeline to assess pipeline defects and to collect positional data for enhanced mapping. In-line inspection tools are used to detect and size dents or other mechanical damage, metal loss, such as external or internal corrosion, cracking in seam welds or in the pipe body, and can be used to detect whether the pipe has moved from run to run. In-line inspection is one of the primary tools for managing the integrity of pipelines.
<b>integrity management program</b>	A management system to ensure the long-term functional integrity of the pipeline and facilities. The focus of the program is to identify all hazards considered to be potential threats to the safe and reliable operations of the pipeline, develop programs for the assessment of the condition of the pipeline and facilities, monitor for the occurrence of identified threats (such as external corrosion) and implement proactive measures to prevent releases resulting from identified hazards. Integrity management includes processes for the assessment and management of risk and continuous improvement.
<b>IR</b>	The abbreviation for Indian reserve.
<b>ISNetworld</b>	ISNetworld is an online contractor management database that collects health, safety, procurement, quality and regulatory information designed to meet governmental record keeping, and owner or client requirements.

<b>Kamloops Terminal</b>	The midway point on the TMPL system in Kamloops, BC. The Kamloops Terminal houses two tanks with a total capacity of about 25,600 m <sup>3</sup> (161,000 bbl) and includes meters, provers, pumps and ancillary facilities. At this terminal, refined product received from the Edmonton Terminal is used for local consumption. Crude oil is received from northeastern British Columbia and transported on the TMPL system to the Burnaby Terminal.
<b>Kinder Morgan Canada Inc.</b>	The operator of the Trans Mountain pipeline system.
<b>km</b>	The metric symbol for kilometre.
<b>KMC</b>	The abbreviation for Kinder Morgan Canada Inc.
<b>kW</b>	The metric symbol for kilowatt.
<b>land use management plans</b>	Management plans, such as official community plans and municipal development plans that provide direction for managing specific planning areas through implementation of policies and strategies to meet specific goals and objectives.
<b>Line 1 (existing line)</b>	<p>Comprises existing and currently active 609.6 mm (24 inch) OD pipeline segments (i.e., Edmonton to Edson, AB, Hargreaves to Darfield, BC, and Kamloops to Burnaby, BC) and 762.0 mm (30 inch) OD pipeline segments (i.e., Edson to Hinton, AB, and Black Pines to Kamloops, BC). Line 1 includes two deactivated 609.6 mm (24 inch) OD segments (i.e., Hinton, AB, to Hargreaves, BC, and Darfield to Black Pines, BC) that will be reactivated.</p> <p>Line 1 will have a sustainable capacity of 55,640 m<sup>3</sup>/d (350,000 bbl/d) based on an assumed slate of heavy crude oil, light crude oil, light synthetic oil and refined products.</p>
<b>Line 2 (new line)</b>	Comprises three 914.4 mm (36 inch) OD pipeline segments (i.e., Edmonton to Hinton, AB, Hargreaves to Darfield, BC, and Black Pines to Burnaby, BC), an existing and currently active 914.4 mm pipeline segment (i.e., Hinton, AB, to Hargreaves, BC) and an existing and currently active 762.0 mm (30 inch) OD pipeline segment (i.e., Darfield to Black Pines, BC). Line 2 will have a sustainable capacity of about 85,850 m <sup>3</sup> /d (540,000 bbl/d) based on an assumed crude slate of synthetic crude oil and diluted bitumen.
<b>m</b>	The metric symbol for metre.
<b>m<sup>3</sup></b>	The metric symbol for cubic metres.
<b>m<sup>3</sup>/d</b>	The metric symbol for cubic metres per day.
<b>magnetic flux leakage</b>	A method of nondestructive testing used to detect corrosion and pitting in steel structures.
<b>mainline block valves</b>	A remotely operated valve that can enable automatic emergency shutdown and isolation of the pipeline along a given segment.

<b>MFL</b>	The abbreviation for magnetic flux leakage.
<b>MLA</b>	The abbreviation for Member of the Legislative Assembly (Alberta).
<b>MLBV</b>	The abbreviation for mainline block valve.
<b>mm</b>	The metric symbol for millimetres.
<b>MRA</b>	The abbreviation for movement restricted area.
<b>MP</b>	The abbreviation for Member of Parliament (federal).
<b>MCTS</b>	The abbreviation for Marine Communications and Traffic Service.
<b>N<sub>2</sub>O</b>	The chemical symbol for nitrous oxide.
<b>natural hazards prevention program</b>	A program in place to detect, monitor and remediate locations that are deemed to present risk of causing damage or failure of a pipeline as a result of either a geotechnical or hydrotechnical hazard.
<b>NEB</b>	The abbreviation for the National Energy Board.
<b>NEB Act</b>	The abbreviation for the <i>National Energy Board Act</i> .
<b>NFPA</b>	The abbreviation for the National Fire Protection Association.
<b>NO<sub>x</sub></b>	The abbreviation for oxides of nitrogen.
<b>OD</b>	The abbreviation for outside diameter.
<b>oil spill containment and recovery units</b>	Oil spill containment and recovery units containing emergency response equipment designed to retain and recover spilled product in water and on land.
<b>OSCAR</b>	The abbreviation for oil spill containment and recovery.
<b>PD</b>	The abbreviation for Project Description.
<b>pig</b>	An in-line scraper (i.e., brush, blade cutter or swab) that is forced through a pipeline by fluid pressure. The pig is used to remove scale, sand, water and other foreign matter from the interior surfaces of the pipe.
<b>pinniped</b>	An aquatic mammal with limbs ending in fins.
<b>PM</b>	The abbreviation for particulate matter.
<b>PMV</b>	The abbreviation for Port Metro Vancouver.
<b>polycyclic aromatic hydrocarbon</b>	A group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage or other organic substances, such as tobacco or charbroiled meat.

<b>Port Metro Vancouver</b>	A non-shareholder, financially self-sufficient corporation established by the Government of Canada. The PMV is accountable to the federal Minister of Transport, Infrastructure and Communities. The PMV is responsible for the operation and development of the assets and jurisdictions of over 600 km of shoreline, extending from Point Roberts at the Canada-US border through the Burrard Inlet to Port Moody and Indian Arm and from the mouth of the Fraser River eastward to the Fraser Valley.
<b>PPA</b>	The abbreviation for the Pacific Pilotage Authority.
<b>(the) project</b>	The Trans Mountain Expansion Project.
<b>project description</b>	A document providing an initial description of a proposed project, its location and the company's consultation program. It is a preliminary submission that companies are requested to file with the National Energy Board at least three months before filing an application to facilitate an efficient regulatory review.
<b>resource management and conservation plans</b>	Management plans that consider environmental, economic and cultural interests and that provide long-term direction for managing sustainable development of land and resources in the context of current and emerging issues.
<b>right-of-way</b>	A legally defined strip of land, typically 18 m wide, with defined boundaries, in which the pipeline runs through properties owned by others.
<b>SARA</b>	The abbreviation for the <i>Species at Risk Act</i> .
<b>SCADA</b>	The abbreviation for supervisory control and data acquisition.
<b>scraper trap</b>	A scraper trap is an assembly to send and receive in-line inspection tools (e.g., pigs) for maintenance operations.
<b>SO<sub>2</sub></b>	The chemical symbol for sulphur dioxide.
<b>species of special concern</b>	As defined by the SARA, 'a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats'
<b>Sumas pump station</b>	Located in Abbotsford, BC, the Sumas pump station works in conjunction with the Sumas Terminal routing crude oil from the TMPL system into Washington State via Trans Mountain's affiliate, Trans Mountain Pipeline (Puget Sound) LLC.
<b>Sumas Terminal</b>	Located in Abbotsford, British Columbia, the Sumas Terminal houses six tanks with a total capacity of about 113,800 m <sup>3</sup> (716,000 bbl) and includes meters, provers, pumps and ancillary facilities. The Sumas Terminal works in conjunction with Sumas pump station routing crude oil from the TMPL system into Washington via Trans Mountain's affiliate, Trans Mountain Pipeline (Puget Sound) LLC.

<b>supervisory control and data acquisition system</b>	A system that continuously provides operating information to control centre operators responsible for the TMPL system. The SCADA system contains a real-time transient leak detection system that monitors flow metering and other instrumentation across the pipeline to run a hydraulic model that simulates and compares itself to actual operating conditions along the pipeline.
<b>Technical Review Process of Marine Terminal Systems and Transshipment Sites</b>	An extensive, voluntary review process focusing on operational ship safety, route safety in Canadian waters, and the environmental concerns associated with bulk loading or unloading of oil, chemicals or liquefied gases at a marine terminal system. The TERMPOL process is managed by Transport Canada and conducted by a federal and provincial interagency committee.
<b>TERMPOL</b>	The abbreviation for technical review process of marine terminal systems and transshipment sites.
<b>TMPL system or system</b>	The abbreviation for the Trans Mountain pipeline system.
<b>total suspended solids</b>	A measure of water quality. Solid materials, including organic and inorganic, that are suspended in the water, including silt, plankton and industrial waste.
<b>traditional ecological knowledge</b>	The understanding of the biotic and physical world by Aboriginal peoples.
<b>traditional land use</b>	The current and former use of the land and its resources by Aboriginal peoples.
<b>Trans Mountain</b>	The abbreviation for Trans Mountain Pipeline ULC.
<b>Trans Mountain Pipeline ULC</b>	A Canadian corporation with its head office located in Calgary, Alberta, a general partner of Trans Mountain Pipeline L.P., and fully owned by Kinder Morgan Energy Partners, L.P.
<b>US</b>	The abbreviation for United States.
<b>USCG</b>	The abbreviation for United States Coast Guard.
<b>VOC</b>	The abbreviation for volatile organic compound.
<b>volatile organic compounds</b>	Carbon-containing gases and vapours resulting from hydrocarbons, and other numerous man-made and naturally occurring chemical compounds, some of which are known or suspected of having direct toxic effects.
<b>WCMRC</b>	The abbreviation for Western Canada Marine Response Corporation.
<b>Western Canada Marine Response Corporation</b>	A Transport Canada certified response organization mandated to ensure there is a state of preparedness in Vancouver Harbour in the event of a spill.

<b>Westridge delivery line</b>	A single 609.6 mm (24 inch) OD delivery line measuring 4 km in length that runs from the Burnaby Terminal to the Westridge Marine Terminal. The project proposes to construct two additional 762.0 mm (30 inch) OD lines about 4 km in length.
<b>Westridge Marine Terminal</b>	Trans Mountain owned marine loading facility located within Port Metro Vancouver that can accommodate ships up to 120,000 dead weight tonnes and barges. This facility also receives jet fuel, which is delivered to Vancouver International Airport through Trans Mountain's affiliate, Trans Mountain (Jet Fuel) Inc. The Westridge Marine Terminal has been in operation since 1957.
<b>wildlife management units</b>	Hunting in Alberta is governed by seasons, rules and regulations unique to specific wildlife management units across the province, which is managed by Alberta Environment and Sustainable Resource Development, in accordance with regulations established under the Alberta <i>Wildlife Act</i> .