TRANSMOUNTAIN

Trans Mountain Expansion Project
Email: info@transmountain.com | Phone: 1.866.514.6700 | Website: www.transmountain.com

December 16, 2013

National Energy Board
444 – 7th Avenue SW
Calgary, AB, T2P 0X8

Attention: Ms. Sheri Young, Secretary of the Board

Dear Ms. Young:

Re: Trans Mountain Pipeline ULC
Trans Mountain Expansion Project Application
Board File OF-Fac-Oil-T260-2013-03 01

Trans Mountain Pipeline ULC, as General Partner of Trans Mountain Pipeline L.P. (collectively "Trans Mountain"), is pleased to submit its application for a Certificate of Public Convenience and Necessity ("CPCN") in respect of the Trans Mountain Expansion Project ("the Project"). The Project will increase the capacity of the existing Trans Mountain pipeline system from 47,690 m^3/d (300,000 bbl/d) to 141,500 m^3/d (890,000 bbl/d). The Project consists of three components: (1) pipeline segments that complete a twinning (or "looping") of the existing pipeline in Alberta and British Columbia ("BC"); (2) new and modified facilities, including pump stations and tanks; and (3) three new berths at the Westridge Marine Terminal in Burnaby, BC.

As discussed in the CPCN application, the Project has been developed in response to requests for service from Western Canadian oil producers and west coast refiners for increased pipeline capacity in support of growing oil production and access to growing west coast and offshore markets. In May 2013, pursuant to the National Energy Board's Reasons for Decision RH-001-2012, the Project received approval pursuant to Part IV of the *National Energy Board Act* for the tolling methodology that would apply to the Project. This approval reinforces market support for the Project and provided Trans Mountain with the necessary economic incentive to proceed with design, consultation and regulatory applications for the Project.

The CPCN application consists of eight volumes, including the environmental and socio-economic assessment, risk assessments and an overview of the Aboriginal and stakeholder engagement carried out by Trans Mountain. This information addresses the filing requirements contained in Part III of the *National Energy Board Act* and as outlined in the Board's Filing Manual. It also addresses the information required under section 19(1) of the *Canadian Environmental Assessment Act, 2012*.

In addition, Trans Mountain is currently participating in Transport Canada's voluntary Technical Review Process of Marine Terminal Systems and Transshipment Sites ("TERMPOL") process to address the increase in marine traffic to offload product from the Project. The TERMPOL process will take into consideration the operating systems and protocols associated with existing marine transportation, and examine the implications of the possible increase in marine vessel traffic to offload the product transported by the Project. Trans Mountain anticipates that the TERMPOL review process will be concluded before mid-2014, and will help inform the NEB regulatory process for the Project.

The CPCN application will be downloadable from the Trans Mountain website at www.transmountain.com as well as the NEB website at www.neb-one.gc.ca.

Communications in respect of this CPCN application should be directed to:

Mr. D. Scott Stoness
Vice President, Finance & Regulatory Affairs
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Email: Scott_Stoness@kindermorgan.com

-and-

Mr. Shawn H.T. Denstedt, Q.C.
Osler, Hoskin & Harcourt LLP
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Calgary, Alberta, T2P 5H1
Telephone: 403-260-7088
Email: SDenstedt@osler.com

Should the Board require additional information with respect to the CPCN application, please contact the Trans Mountain representatives listed above.

Sincerely,

Trans Mountain Pipeline ULC

Ian D. Anderson
President

Enclosures

cc. Tim Archer, Major Projects Management Office (Timothy.Archer@NRCan-RNCan.gc.ca)

TRANSMOUNTAIN

CELEBRATING 60 YEARS OF SERVICE 1953 to 2013

Trans Mountain Pipeline ULC

Trans Mountain Expansion Project

An Application Pursuant to Section 52 of the National Energy Board Act

December 2013

Volume 1 Summary

KINDER MORGAN CANADA

NATIONAL ENERGY BOARD

IN THE MATTER OF

the *National Energy Board Act*,
R.S.C. 1985, c. N-7, as amended, ("*NEB Act*")
and the Regulations made thereunder;

AND IN THE MATTER OF

the *Canadian Environmental Assessment Act, 2012*,
S.C. 2012, c. 37, as amended,
and the Regulations made thereunder;

AND IN THE MATTER OF

an application by Trans Mountain Pipeline ULC
as General Partner of Trans Mountain Pipeline L.P.
(collectively "Trans Mountain")
for a Certificate of Public Convenience and Necessity and
other related approvals pursuant to Part III of the *NEB Act*

APPLICATION BY TRANS MOUNTAIN FOR APPROVAL OF THE TRANS MOUNTAIN EXPANSION PROJECT

December 2013

To: The Secretary
The National Energy Board
444 — 7th Avenue SW
Calgary, AB T2P 0X8

Trans Mountain Expansion Project
Application Pursuant to Section 52 of the *National Energy Board Act*

Guide to the Application

Application	
Transmittal - Letter to the National Energy Board	
Volume 1	**Summary**
Volume 2	Project Overview, Economics and General Information
Volume 3A	Public Consultation
Volume 3B	Aboriginal Engagement
Volume 3C	Landowner Relations
Volume 4A	Project Design and Execution – Engineering
Volume 4B	Project Design and Execution – Construction
Volume 4C	Project Design and Execution – Operations and Maintenance
Volume 5A	Environmental and Socio-Economic Assessment – Biophysical
Volume 5B	Environmental and Socio-Economic Assessment – Socio-Economic
Volume 5C	Environmental and Socio-Economic Assessment – Biophysical Technical Reports
Volume 5D	Environmental and Socio-Economic Assessment – Socio-Economic Technical Reports
Volume 6A	Environmental Compliance
Volume 6B	Pipeline Environmental Protection Plan
Volume 6C	Facilities Environmental Protection Plan
Volume 6D	Westridge Marine Terminal Environmental Protection Plan
Volume 6E	Environmental Alignment Sheets
Volume 7	Risk Assessment and Management of Pipeline and Facility Spills
Volume 8A	Marine Transportation
Volume 8B	Marine Environmental and Socio-Economic Technical Reports
Volume 8C	TERMPOL Reports

This volume contains:

Volume 1			
Section 1.0	Application and General Information	**Section 4.0**	Provincial Interests
Section 2.0	Summary and Conclusions	**Section 5.0**	References
Section 3.0	Summary of the Environmental and Socio-Economic Assessment		

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ABBREVIATIONS AND ACRONYMS

This table lists the abbreviations and acronyms used in this volume of the application.

Term	Meaning
AB	Alberta
bbl	barrel
bbl/d	barrels per day
BC	British Columbia
BC Five Conditions	five requirements announced by BC
BC MOE	BC Ministry of Environment
Board	National Energy Board
CCO	Control Centre Operator
CEA Act, 2012	*Canadian Environmental Assessment Act, 2012*
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CPCN	Certificate of Public Convenience and Necessity
CSA	Canadian Standards Association
ENGOs	Environmental Non-governmental Organizations
EPP	environmental protection plan
ERPs	Emergency Response Plans
ESA	Environmental and Socio-Economic Assessment
ESD	emergency shut-down
FIMP	Facilities Integrity Management Program
GDP	gross domestic product
GHG	Greenhouse Gas
H_2S	Hydrogen sulphide
ICS	Incident Command System
ILI	in-line inspection
IMP	Integrity Management Program
ISLMS	Integrated Safety and Loss Management System
km	kilometre
KMC	Kinder Morgan Canada Inc.
LOUs	Letters of Understanding
LSA	local study area
m^3/d	cubic metres per day
MBAs	Mutual Benefit Agreements
N_2O	nitrous oxide
NEB	National Energy Board
NEB Act	*National Energy Board Act*
OD	outside diameter
OPR	Onshore Pipeline Regulations
OPS	Operational Policy Statements
OSCAR	Oil Spill Containment and Recovery
PCEM	post-construction environmental monitoring
PM	particulate matter
PMV	Port Metro Vancouver
Q&A	question and answer
RMLBV	remote mainline block valves
RSA	Regional Study Area

Term	Meaning
SARA	*Species at Risk Act*
SCADA	Supervisory Control and Data Acquisition
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
TEK	traditional ecological knowledge
TERA	TERA Environmental Consultants
TERMPOL	Technical Review Process of Marine Terminal Systems and Transshipment Sites
the Panel	Tanker Safety Expert Panel
the Project	Trans Mountain Expansion Project
TLU	traditional land use
TMEP	Trans Mountain Expansion Project
TMPL	Trans Mountain pipeline
TMPL system	Trans Mountain pipeline system
TMRU	traditional marine resource use
Trans Mountain	Trans Mountain Pipeline ULC as general partner of Trans Mountain
TWS	temporary workspace
WCMRC	Western Canada Marine Response Corporation
YVR	Vancouver International Airport

NEB FILING MANUAL CHECKLIST

CHAPTER 3 – COMMON INFORMATION REQUIREMENTS

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
3.1 Action Sought by Applicant			
1.	Requirements of s.15 of the Rules.	Volume 1 Section 1.1	---
3.2 Application or Project Purpose			
1.	Purpose of the proposed project.	Volume 2 Section 1.1	---
3.4 Consultation		Volumes 3A, 3B, 3C; Volumes 5A, 5B Section 3; Volume 8A Section 3	--
3.4.1 Principles and Goals of Consultation			
1.	The corporate policy or vision.	Volume 3A Section 1.2.1 Volume 3B Section 1.2.1	--
2.	The principles and goals of consultation for the project.	Volume 3A Section 1.2.2 Volume 3B Section 1.2.2 Volume 5A Section 3.2.1 Volume 5B Section 3.2.1	--
3.	A copy of the Aboriginal protocol and copies of policies and principles for collecting traditional use information, if available.	Volume 3B Section 1.3.5	--
3.4.2 Design of Consultation Program			
1.	The design of the consultation program and the factors that influenced the design.	Volume 3A Section 1.3 Volume 3B Section 1.3 Volume 5A Section 3.1.1, 3.2.2 Volume 5B Section 3.1.1, 3.2.2	--
3.4.3 Implementing a Consultation Program			
1.	The outcomes of the consultation program for the project.	Volume 3A Section 1.7 Volume 3B Section 1.5 Table 1.5.1 Volume 5A Section 3.1.5, 3.2.4 Volume 5B Section 3.1.5, 3.2.4	--
3.4.4 Justification for Not Undertaking a Consultation Program			
2.	The application provides justification for why the applicant has determined that a consultation program is not required for the project.	N/A	N/A
3.5 Notification of Commercial Third Parties			
1.	Confirm that third parties were notified.	Volume 2 Section 3.2.2	--
2.	Details regarding the concerns of third parties.	Volume 2 Section 3.2.2	--
3.	List the self-identified interested third parties and confirm they have been notified.	N/A	N/A
4.	If notification of third parties is considered unnecessary, an explanation to this effect.	N/A	N/A

CHAPTER 4 – SECTIONS 4.1 AND 4.2: COMMON REQUIREMENTS FOR PHYSICAL PROJECTS

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
4.1 Description of the Project			--
1.	The project components, activities and related undertakings.	Volume 2 Section 2.0; Volume 4A	--
2.	The project location and criteria used to determine the route or site.	Volume 2 Section 4.0; Volume 4A	--
3.	How and when the project will be carried out.	Volume 2 Section 2.3; Volume 4B Section 2.0	--
4.	Description of any facilities, to be constructed by others, required to accommodate the proposed facilities.	N/A	N/A
5.	An estimate of the total capital costs and incremental operating costs, and changes to abandonment cost estimates.	Volume 2 Section 2.9	--
6.	The expected in-service date.	Volume 2 Section 1.1; Volume 4B Section 2.1	--
4.2 Economic Feasibility, Alternatives and Justification			
4.2.1 Economic Feasibility			
1.	Describe the economic feasibility of the project.	Volume 2 Section 3.5	--
4.2.2 Alternatives			
1.	Describe the need for the project, other economically-feasible alternatives to the project examined, along with the rationale for selecting the applied for project over these other possible options.	Volume 2 Section 3.0; Volume 8A Section 2.2	--
2.	Describe and justify the selection of the proposed route and site including a comparison of the options evaluated using appropriate selection criteria.	Volume 2 Section 4.0; Volume 8A Section 2.2	--
3.	Describe the rationale for the chosen design and construction methods. Where appropriate, describe any alternative designs and methods evaluated and explain why these other options were eliminated.	Volume 2 Section 4.0; Volume 8A Section 2.2	--
4.2.3 Justification			
1.	Provide a justification for the proposed project	Volume 2 Section 3.4	--

GUIDE A – A.1 ENGINEERING

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
A.1.1 Engineering Design Details			
1.	Fluid type and chemical composition.	Volume 4A Section 3.1.1	--
2.	Line pipe specifications.	Volume 4A Section 3.2.8	--
3.	Pigging facilities specifications.	Volume 4A Section 3.3.1, 3.3.2	--
4.	Compressor or pump facilities specifications.	Volume 4A Section 3.4	--
5.	Pressure regulating or metering facilities specifications.	Volume 4A Section 3.5	--
6.	Liquid tank specifications, or other commodity storage facilities.	Volume 4A Section 3.4	--
7.	New control system facilities specifications.	Volume 4A Section 3.3	--
8.	Gas processing, sulphur or LNG plant facilities specifications.	N/A	N/A
9.	Technical description of other facilities not mentioned above.	N/A	N/A
10.	Building dimensions and uses.	Volume 4A Section 3.3, 3.4, 3.5	--
11.	If project is a new system that is a critical source of energy supply, a description of the impact to the new system capabilities following loss of critical component.	N/A	N/A
A.1.2 Engineering Design Principles			
1.	Confirmation project activities will follow the requirements of the latest version of CSA Z662.	Volume 4A Section 2.2	--
2.	Provide a statement indicating which Annex is being used and for what purpose	Volume 4A Section 2.3	--
3.	Statement confirming compliance with OPR or PPR.	Volume 4A Section 2.1	--
4.	Listing of all primary codes and standards, including version and date of issue.	Volume 4A Section 2, Table 5.1.1	--
5.	Confirmation that the project will comply with company manuals and confirm manuals comply with OPR/PPR and codes and standards.	Volume 4A Section 2.6, Table 5.1.2	--
6.	Any portion of the project a non-hydrocarbon commodity pipeline system? Provide a QA program to ensure the materials are appropriate for their intended service.	N/A – all hydrocarbons	N/A
7.	If facility subject to conditions not addressed in CSA Z662: • Written statement by qualified professional engineer • Description of the designs and measures required to safeguard the pipeline	Volume 4A Section 2.9	--
8.	If directional drilling involved: • Preliminary feasibility report • Description of the contingency plan	Volume 4A Section 2.12	--
9.	If the proposed project involves the reuse of materials, provide an engineering assessment in accordance with CSA Z662 that indicates its suitability for the intended service.	Volume 4A, Section 2.7	--
10.	If new materials are involved, provide material supply chain information, in tabular format.	Volume 4A Section 2.7	
11.	If reuse of material is involved, provide an engineering assessment in accordance with CSA Z662 that indicates its suitability for the intended service.	Volume 4A, Section 2.7	--
A.1.3 Onshore Pipeline Regulations			
1.	Designs, specifications programs, manuals, procedures, measures or plans for which no standard is set out in the OPR or PPR.	--	Existing standards will be followed
2.	A quality assurance program if project non-routine or incorporates unique challenges due to geographical location.	--	No unique challenges
3.	If welding performed on a liquid-filled pipeline that has a carbon equivalent of 0.50% or greater and is a permanent installation: • Welding specifications and procedures • Results of procedure qualification tests	--	Welding on liquid filled pipe will not be conducted

GUIDE A – A.2 ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT

The following table identifies where information requested in the National Energy Board (NEB) Filing Manual Guide A – A.2 Environmental and Socio-economic Assessment checklist may be found in the various volumes of the Application for the Trans Mountain Expansion Project.

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
A.2.5 Description of the Environmental and Socio-Economic Setting				
1.	Identify and describe the current biophysical and socio-economic setting of each element (*i.e.*, baseline information) in the area where the project is to be carried out.	Volume 5A: ESA - Biophysical · Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic · Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation · Section 4.2 Volume 8B: Technical Reports	---
2.	Describe which biophysical or socio-economic elements in the study area are of ecological, economic, or human importance and require more detailed analysis taking into account the results of consultation (see Table A-1 for examples). Where circumstances require more detailed information in an ESA see: i. Table A-2 – Filing Requirements for Biophysical Elements; or ii. Table A-3 – Filing Requirements for Socio-economic Elements.	Volume 5A: ESA - Biophysical · Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic · Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation · Section 4.2 Volume 8B: Technical Reports	---
3.	Provide supporting evidence (*e.g.*, references to scientific literature, field studies, local and traditional knowledge, previous environmental assessment and monitoring reports) for: · information and data collected; · analysis completed; · conclusions reached; and · the extent of professional judgment or experience relied upon in meeting these information requirements, and the rationale for that extent of reliance.	Volume 5A: ESA - Biophysical · Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic · Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation · Section 4.2 Volume 8B: Technical Reports	---
4.	Describe and substantiate the methods used for any surveys, such as those pertaining to wildlife, fisheries, plants, species at risk or species of special status, soils, heritage resources or traditional land use, and for establishing the baseline setting for the atmospheric and acoustic environment.	Volume 5A: ESA - Biophysical · Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic · Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation · Section 4.2 Volume 8B: Technical Reports	---
5.	Applicants must consult with other expert federal, provincial or territorial departments and other relevant authorities on requirements for baseline information and methods.	Volume 5A: ESA - Biophysical · Sections 3.0, 5.0 and 6.0 Volume 5B: ESA - Socio-Economic · Sections 3.0, 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation · Sections 3.0 and 4.2 Volume 8B: Technical Reports	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
A.2.6 Effects Assessment				
Identification and Analysis of Effects				
1.	Describe the methods used to predict the effects of the project on the biophysical and socio-economic elements, and the effects of the environment on the project (*i.e.*, changes to the Project caused by the environment).	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Technical Reports	Volume 8A: Marine Transportation · Sections 4.3, 5.5 and 5.6	---
2.	Predict the effects associated with the proposed project, including those that could be caused by construction, operations, decommissioning or abandonment, as well as accidents and malfunctions. Also include effects the environment could have on the project. For those biophysical and socio-economic elements or their valued components that require further analysis (see Table A-1), provide the detailed information outlined in Tables A-2 and A-3.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Technical Reports	Volume 8A: Marine Transportation · Sections 4.3, 5.6 and 5.7 Volume 8B: Technical Reports	---
Mitigation Measures for Effects				
1.	Describe the standard and project specific mitigation measures and their adequacy for addressing the project effects, or clearly reference specific sections of company manuals that provide mitigation measures. Ensure that referenced manuals are current and filed with the NEB.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports Volume 6B: Pipeline Environmental Protection Plan (EPP) Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP Volume 6E: Environmental Alignment Sheets Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 2.0, 3.0, 4.0, 6.0, 7.0, and 8.0 · Technical Reports	Volume 8A: Marine Transportation · Sections 4.3, 5.1, 5.3, 5.6 and 5.7 Volume 8B: Technical Reports	---
2.	Ensure that commitments about mitigative measures will be communicated to field staff for implementation through an Environmental Protection Plan.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP Volume 6E: Environmental Alignment Sheets Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 2.0, 3.0, 4.0, 6.0, 7.0 and 8.0	Volume 8A: Marine Transportation · Sections 4.3, 5.1, 5.3, 5.6 and 5.7	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
3.	Describe plans and measures to address potential effects of accidents and malfunctions during construction and operation of the project.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 2.0, 4.0, 6.0, 7.0 and 8.0	Volume 8A: Marine Transportation · Sections 4.3, 5.1, 5.3, 5.6 and 5.7	---
Evaluation of Significance				
1.	After taking into account any appropriate mitigation measures, identify any remaining residual effects from the project.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0	Volume 8A: Marine Transportation · Section 4.3	---
2.	Describe the methods and criteria used to determine the significance of remaining adverse effects, including defining the point at which any particular effect on a valued component is considered “significant”.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0	Volume 8A: Marine Transportation · Section 4.3	---
3.	Evaluate significance of residual adverse environmental and socio-economic effects against the defined criteria.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0	Volume 8A: Marine Transportation · Section 4.3	---
4.	Evaluate the likelihood of significant, residual adverse environmental and socio-economic effects occurring and substantiate the conclusions made.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0	Volume 8A: Marine Transportation · Section 4.3	---
A.2.7 Cumulative Effects Assessment				
Scoping and Analysis of Cumulative Effects				
1.	Identify the valued components for which residual effects are predicted, and describe and justify the methods used to predict any residual results.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
2.	For each valued component where residual effects have been identified, describe and justify the spatial and temporal boundaries used to assess the potential cumulative effects.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
3.	Identify other physical works or activities that have been or will be carried out within the identified spatial and temporal boundaries for the cumulative effects assessment.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
4.	Identify whether the effects of those physical works or activities that have been or will be carried out would be likely to produce effects on the valued components within the identified spatial and temporal boundaries.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
5.	Where other physical works or activities may affect the valued components for which residual effects from the applicant's proposed project are predicted, continue the cumulative effects assessment, as follows: · consider the various components, phases and activities associated with the applicant's project that could interact with other physical work or activities; · provide a description of the extent of the cumulative effects on valued components; and · where professional knowledge or experience is cited, explain the extent to which professional knowledge or experience was relied upon and justify how the resulting conclusions or decisions were reached.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
Mitigation Measures for Cumulative Effects				
1.	Describe the general and specific mitigation measures, beyond project-specific mitigation already considered, that are technically and economically feasible to address any cumulative effects.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
Applicant's Evaluation of Significance of Cumulative Effects				
1.	After taking into account any appropriate mitigation measures for cumulative effects, identify any remaining residual cumulative effects.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
2.	Describe the methods and criteria used to determine the significance of remaining adverse cumulative effects, including defining the point at which each identified cumulative effect on a valued component is considered "significant".	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
3.	Evaluate the significance of adverse residual cumulative effects against the defined criteria.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
4.	Evaluate the likelihood of significant, residual adverse cumulative environmental and socio-economic effects occurring and substantiate the conclusions made.	Volume 5A: ESA - Biophysical · Section 8.0 Volume 5B: ESA - Socio-Economic · Section 8.0	Volume 8A: Marine Transportation · Section 4.4	---
A.2.8 Inspection, Monitoring and Follow-up				
1.	Describe inspection plans to ensure compliance with biophysical and socio-economic commitments, consistent with Sections 48, 53 and 54 of the *NEB Onshore Pipeline Regulations (OPR)*.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP	Volume 8A: Marine Transportation · Section 4.3	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
2.	Describe the surveillance and monitoring program for the protection of the pipeline, the public and the environment, as required by Section 39 of the *NEB OPR*.	Volume 5A: ESA - Biophysical · Section 7.0 Volume 5B: ESA - Socio-Economic · Section 7.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP	Volume 8A: Marine Transportation · Section 4.3	---
3.	Consider any particular elements in the Application that are of greater concern and evaluate the need for a more in-depth monitoring program for those elements.	Volume 5A: ESA - Biophysical · Sections 9.0 and 10.0 Volume 5B: ESA - Socio-Economic · Sections 9.0 and 10.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP (Socio-Economic Management Plan of Appendix C)	Volume 8A: Marine Transportation · Section 4.5	---
4.	For *Canadian Environmental Assessment (CEA) Act, 2012* designated projects, identify which elements and monitoring procedures would constitute follow-up under the *CEA Act, 2012*.	Volume 5A: ESA - Biophysical · Section 10.0 Volume 5B: ESA - Socio-economic · Section 10.0	N/A	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
Table A-1 Circumstances and Interactions Requiring Detailed Biophysical and Socio-Economic Information				
Physical and meteorological environment		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0 and 7.0	N/A	---
Soil and soil productivity		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Soil Assessment Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Section 5.3, 6.0 and 7.0	N/A	---
Water quality and quantity (onshore and marine)		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Groundwater Technical Report · Fisheries (Alberta) Technical Report · Fisheries (British Columbia) Technical Report · Wetland Evaluation Technical Report · Marine Sediment and Water Quality – Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Section 7.0 · Quality Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Ecological Risk Assessment of Marine Transportation Spills Technical Report	---
Air emissions (onshore and marine)		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Marine Air Quality and Greenhouse Gas – Marine Transportation Technical Report · Air Quality and Greenhouse Gas Emissions Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Section 7.0	Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Air Quality and Greenhouse Gas Emissions	---
Greenhouse gas emissions (onshore and marine)		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0 and 7.0 Volume 5C: ESA - Biophysical Technical Reports · Air Quality and Greenhouse Gas Emissions Technical Report	Volume 8A: Marine Transportation · Sections 4.2 and 4.3 Volume 8B: Technical Reports · Marine Air Quality and Greenhouse Gas Emissions	---
Acoustic environment (onshore and marine)		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0, and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Acoustic Environment Technical Report	Volume 8A: Marine Transportation · Sections 4.2, 4.3 and 4.4 Volume 8B: Technical Reports · Marine Noise (Atmospheric)	---
Fish and fish habitat (onshore and marine), including any fish habitat compensation required		Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Fisheries (Alberta) Technical Report · Fisheries (British Columbia) Technical Report · Marine Resources - Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Resources – Marine Transportation Technical Report · Ecological Risk Assessment of Westridge Marine Terminal Spills	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
	Wetlands	Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Wetland Evaluation Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	N/A	---
	Vegetation	Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Vegetation Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	N/A	---
	Wildlife and wildlife habitat (onshore and marine)	Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Wildlife and Wildlife Habitat Technical Report · Wildlife Modeling and Species Accounts Report · Marine Resources –Westridge Marine Terminal Technical Report · Marine Birds – Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation · Sections 4.2. 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Resources – Marine Transportation Technical Report · Marine Birds – Marine Transportation Technical Report · Ecological Risk Assessment of Westridge Marine Terminal Spills	---
	Species at Risk or Species of Special Status and related habitat (onshore and marine)	Volume 5A: ESA - Biophysical · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports · Fisheries (Alberta) Technical Report · Fisheries (British Columbia) Technical Report · Vegetation Technical Report · Wildlife and Wildlife Habitat Technical Report · Wildlife Modeling and Species Accounts Report · Marine Resources –Westridge Marine Terminal Technical Report · Marine Birds – Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation · Sections 4.2. 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Resources – Marine Transportation Technical Report · Marine Birds – Marine Transportation Technical Report · Marine Transportation Spills Ecological Risk Assessment Technical Report	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
	Human occupancy and resource use (onshore and marine)	Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports · Socio-Economic Technical Report · Managed Forest Areas Technical Report · Agricultural Assessment Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0	Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report	---
	Heritage resources	Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0 and 7.0 Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Section 6.3.3	N/A	---
	Navigation and navigation safety	Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0 and 7.0 Volume 5D: ESA - Socio-Economic Technical Reports · Socio-Economic Technical Report	Volume 8A: Marine Transportation · Section 5.2	---
	Traditional land and resource use	Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports · Traditional Land and Resource Use Report · Pipeline and Facilities Human Health Risk Assessment Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Traditional Marine Use Report for Marine Transportation · Marine Transportation Human Health Risk Assessment Technical Report	---
	Social and cultural well-being	Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports · Socio-Economic Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0	N/A	---
	Human health and aesthetics	Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports · Socio-Economic Technical Report · Community Health Technical Report · Viewshed Modelling Analysis Technical Report · Pipeline and Facilities Human Health Risk Assessment Technical Report Volume 7 Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0 · Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Qualitative Human Health Risk Assessment of Westridge Marine Terminal Technical Report Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Transportation Human Health Risk Assessment Technical Report · Marine Transportation Spills Human Health Risk Assessment Technical Report	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
Infrastructure and services		Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports · Socio-Economic Technical Report · Community Health Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills · Sections 6.0, 7.0 and 8.0	Volume 8A: Marine Transportation · Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports · Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report	---
Employment and economy		Volume 5B: ESA - Socio-Economic · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports · Socio-Economic Technical Report · Worker Expenditures Analysis Technical Report	N/A	---

GUIDE A – A.3 ECONOMICS

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
A.3.1 Supply			
1.	A description of each commodity.	Volume 2 Section 3.1.1	--
2.	A discussion of all potential supply sources.	Volume 2 Section 3.3.2	--
3.	Forecast of productive capacity over the economic life of the facility.	Volume 2 Sections 3.3.1, 3.4.1	
4.	For pipelines with contracted capacity, a discussion of the contractual arrangements underpinning supply.	Volume 2 Section 3.3.2	--
A.3.2 Transportation Matters			
Pipeline Capacity			
1.	In the case of expansion provide: • Pipeline capacity before and after and size of increment • Justification that size of expansion is appropriate	Volume 2 Sections 1.1, 2.1, 3.5	--
2.	In case of new pipeline, justification that size of expansion is appropriate given available supply.	N/A – expansion	N/A
Throughput			
1.	For pipelines with contracted capacity, information on contractual arrangements.	Volume 2 Section 3.2.1	--
2.	For non-contract carrier pipelines, forecast of annual throughput volumes by commodity type, receipt location and delivery destination over facility life.	N/A	N/A
3.	If project results in an increase in throughput: • theoretical and sustainable capabilities of the existing and proposed facilities versus the forecasted requirements • flow formulae and flow calculations used to determine the capabilities of the proposed facilities and the underlying assumptions and parameters	Volume 2 Section 3.1	--
4.	If more than one type of commodity transported, a discussion pertaining to segregation of commodities including potential contamination issues or cost impacts.	N/A	N/A
A.3.3 Markets			
1.	Provide an analysis of the market in which each commodity is expected to be used or consumed.	Volume 2 Section 3.4.2	--
2.	Provide a discussion of the physical capability of upstream and downstream facilities to accept the incremental volumes that would be received and delivered.	Volume 2 Section 3.4.2	--
A.3.4 Financing			
1.	Evidence that the applicant has the ability to finance the proposed facilities.	Volume 2 Section 3.2.2	--
2.	Estimated toll impact for the first full year that facilities are expected to be in service.	Volume 2 Section 3.2.1	--
3.	Confirmation that shippers have been apprised of the project and toll impact, their concerns and plans to address them.	Volume 2 Section 3.2.1	--
4.	Additional toll details for applications with significant toll impacts.	Volume 2 Section 3.2.1	
A.3.5 Non-NEB Regulatory Approvals			
1.	Confirm that all non-NEB regulatory approvals required to allow the applicant to meet its construction schedule, planned in-service date and to allow the facilities to be used and useful are or will be in place.	Volume 2 Section 1.5	--
2.	If any of the approvals referred to in #1 may be delayed, describe the status of those approval(s) and provide an estimation of when the approval is anticipated.	Volume 2 Section 1.5	--

GUIDE A – A.4 LANDS INFORMATION

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
A.4.1 Land Areas			
1.	• Width of right-of-way and locations of any changes to width • Locations and dimensions of known temporary work space and drawings of typical dimensions • Locations and dimensions of any new lands for facilities	Volume 2 Section 5.2	--
A.4.2 Land Rights			
1.	The type of lands rights proposed to be acquired for the project.	Volume 2 Section 5.3	--
2.	The relative proportions of land ownership along the route of the project.	Volume 2 Section 5.3.2	--
3.	Any existing land rights that will be required for the project.	Volume 2 Section 5.4	--
A.4.3 Lands Acquisition Process			
1.	The process for acquiring lands.	Volume 2 Section 5.4.1, 5.4.2	--
2.	The timing of acquisition and current status.	Volume 2 Section 5.4.3	--
3.	The status of service of section 87(1) notices.	Volume 2 Section 5.4.4	--
A.4.4 Land Acquisition Agreements			
1.	A sample copy of each form of agreement proposed to be used pursuant to section 86(2) of the NEB Act.	Volume 2 Section 5.4.2	--
2.	A sample copy of any proposed fee simple, work space, access or other land agreement.	Volume 2 Section 5.5.2	--
A.4.5 Section 87 Notices			
1.	A sample copy of the notice proposed to be served on all landowners pursuant to section 87(1) of the NEB Act.	Volume 2 Section 5.4.4, Appendix D	--
2.	Confirmation that all notices include a copy of Pipeline Regulation in Canada: A Guide for Landowners and the Public.	Volume 2 Section 5.4.4	--
A.4.6 Section 58 Application to Address a Complaint			
1.	The details of the complaint and describe how the proposed work will address the complaint.	N/A	N/A

CONCORDANCE TABLE WITH THE *CEA ACT, 2012*

CEA Act, 2012 Requirement	Section in *CEA Act, 2012*	Application Volume and Section
The environmental effects of the designated project, including:		
the environmental effects of malfunctions or accidents that may occur in connection with the designated project;	s.19.1(a)	Volume 5A ESA - Biophysical: · Section 7.0 Volume 5B ESA - Socio-economic: · Section 7.0 Volume 7 Risk Assessment and Management of Pipeline and Facility Spills Volume 8A Marine Transportation: · Sections 4.3 and 5.0
any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out;	s.19.1(a)	Volume 5A ESA - Biophysical: · Section 8.0 Volume 5B ESA - Socio-economic: · Section 8.0 Volume 8A Marine Transportation: · Section 4.4
the significance of the effects referred to in paragraph (a);	s.19.1(b)	Volume 5A ESA - Biophysical: · Sections 7.0 and 8.0 Volume 5B ESA - Socio-economic: · Sections 7.0 and 8.0 Volume 8A Marine Transportation: · Sections 4.3 and 4.4
comments from the public – or, with respect to a designated project that requires that a certificate be issued in accordance with an order made under section 54 of the *National Energy Board Act*, any interested party – that are received in accordance with this *act*;	s.19.1(c)	Volume 3A Public Consultation Volume 3B Aboriginal Engagement Volume 3C Landowner Relations Volume 5A ESA - Biophysical: · Section 3.0 Volume 5B ESA - Socio-economic: · Section 3.0 Volume 8A Marine Transportation: · Section 3.0
mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project;	s.19.1(d)	Volume 5A ESA - Biophysical: · Sections 7.0 and 8.0 Volume 5B ESA - Socio-economic: · Sections 7.0 and 8.0 Volume 5C ESA – Biophysical Technical Reports Volume 5D ESA - Socio-economic Technical Reports Volume 6B Pipeline Environmental Protection Plan Volume 6C Facilities Environmental Protection Plan Volume 6D Westridge Marine Terminal Environmental Protection Plan Volume 6E Environmental Alignment Sheets Volume 8A Marine Transportation: · Sections 4.3, 4.4 and 5.0 Volume 8B Technical Reports
the requirements of the follow-up program in respect of the designated project;	s.19.1(e)	Volume 5A ESA - Biophysical: · Section 10.0 Volume 5B ESA - Socio-economic: · Section 10.0
the purpose of the designated project;	s.19.1(f)	Volume 5A ESA - Biophysical: · Section 2.0 Volume 5B ESA - Socio-economic: · Section 2.0 Volume 8A Marine Transportation: · Section 1.1

CONCORDANCE TABLE WITH THE *CEA ACT, 2012*

CEA Act, 2012 Requirement	Section in *CEA Act, 2012*	Application Volume and Section
alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alterative means;	s.19.1(g)	Volume 5A ESA - Biophysical: · Sections 2.0 and 4.0 Volume 5B ESA - Socio-economic: · Sections 2.0 and 4.0 Volume 8A Marine Transportation: · Section 2.2
any change to the designated project that may be caused by the environment;	s.19.1(h)	Volume 5A ESA - Biophysical: · Section 7.10 Volume 8A Marine Transportation: · Section 4.3
the results of any relevant study conducted by a committee established under section 73 or 74; and	s.19.1(i)	N/A
any other matter relevant to the environmental assessment that the responsible authority, or, – if the environmental assessment is referred to a review panel – the Minister, requires to be taken into account.	s.19.1(j)	Volume 8A Marine Transportation Volume 8B Technical Reports Volume 8C TERMPOL Reports These volumes take into consideration the *Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project* (September 10, 2013) (NEB 2013)
The environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge.	s 19.3	Volume 5A ESA - Biophysical: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5B ESA - Socio-economic: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 5D ESA - Socio-economic Technical Reports Volume 8A Marine Transportation: · Sections 4.2, 4.3 and 4.4 Volume 8B Technical Reports
Subsection 5(1) of *CEA Act, 2012* defines environmental effects as a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:		
fish as defined in section 2 of the *Fisheries Act* and fish habitat as defined in subsection 34(1) of that *Act*;	s.5(1)(a)(i)	Volume 5A ESA - Biophysical: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 8A Marine Transportation: · Sections 4.2, 4.3, 4.4 and 5.0 Volume 8B Technical Reports
aquatic species as defined in subsection 2(1) of the *Species at Risk Act;*	s.5(1)(a)(ii)	Volume 5A ESA - Biophysical: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 8A Marine Transportation: · Sections 4.2, 4.3, 4.4 and 5.0 Volume 8B Technical Reports
migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*, and	s.5(1)(a)(iii)	Volume 5A ESA - Biophysical: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 8A Marine Transportation: · Sections 4.2, 4.3, 4.4 and 5.0 Volume 8B Technical Reports
any other component of the environment that is set out in Schedule 2.	s.5(1)(a)(iv)	N/A
Subsection 5(1) of the *CEA Act, 2012* defines environmental effects as (b) a change that may be caused to the environment that would occur		
on federal lands,	s.5(1)(b)(i)	Volume 5A ESA - Biophysical: · Section 7.0 Volume 5B ESA - Socio-economic: · Section 7.0

CONCORDANCE TABLE WITH THE *CEA ACT, 2012*

CEA Act, 2012 Requirement	Section in *CEA Act, 2012*	Application Volume and Section
in a province other than the one in which the *act* or thing is done or where the physical activity, the designated project or the project is being carried out, or	s.5(1)(b)(ii)	N/A No changes are anticipated in provinces other than Alberta and BC in relation to the ESA.
outside Canada.	s.5(1)(b)(iii)	Volume 8A Marine Transportation: · Sections 4.3, 4.4 and 5.0
Subsection 5(1) of the *CEA Act, 2012* defines environmental effects as (c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on:		
health and socio-economic conditions;	s.5(1)(c)(i)	Volume 5B ESA - Socio-economic: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D ESA - Socio-economic Technical Reports Volume 8A Marine Transportation: · Sections 4.3 and 4.4 Volume 8B Technical Reports
physical and cultural heritage;	s.5(1)(c)(ii)	Volume 5B ESA - Socio-economic: · Sections 5.0, 6.0 and 7.0
the current use of lands and resources for traditional purposes; or	s.5(1)(c)(iii)	Volume 5B ESA - Socio-economic: · Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D ESA - Socio-economic Technical Reports Volume 8A Marine Transportation: · Sections 4.3 and 4.4 Volume 8B Technical Reports
any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	s.5(1)(c)(iv)	Volume 5B ESA - Socio-economic: · Sections 5.0, 6.0 and 7.0

VOLUME 1: SUMMARY

1.0 APPLICATION AND GENERAL INFORMATION

1.1.1 Action Sought

Introduction and Purpose of the Application

1. Trans Mountain Pipeline ULC as general partner of Trans Mountain Pipeline L.P. (collectively "Trans Mountain") hereby applies to the National Energy Board ("Board" or "NEB") pursuant to Section 52 of Part III of the *National Energy Board Act* (*NEB Act*), for a Certificate of Public Convenience and Necessity (CPCN) and related approvals for the Trans Mountain Expansion Project (the "Project" or "TMEP").

Applicant

2. Trans Mountain Pipeline ULC is a Canadian corporation with its head office located in Calgary, Alberta. Trans Mountain Pipeline ULC is a general partner of Trans Mountain Pipeline L.P., a limited partnership registered in Alberta and the owner of the existing Trans Mountain pipeline ("TMPL") system. Trans Mountain ULC is the holder of the CPCNs for the TMPL.

3. Trans Mountain is a "company" as the term is defined in the *NEB Act*.

4. Trans Mountain is a wholly-owned subsidiary of Kinder Morgan Energy Partners, L.P. (Kinder Morgan). Kinder Morgan is the largest midstream and the fourth largest energy company (based on combined enterprise value) in North America. Kinder Morgan owns an interest in or operates approximately 130,000 km of pipelines transporting natural gas, refined petroleum products, crude oil, and carbon dioxide. The Kinder Morgan family of companies has a combined enterprise value of approximately $105 billion.[1]

Trans Mountain Pipeline System

5. The existing TMPL system is an approximately 1,147-km pipeline system between Edmonton, Alberta and Burnaby, British Columbia (BC) which transports a range of crude petroleum and refined products to multiple locations in BC. These include: refined product deliveries to Kamloops and Port Moody, and crude petroleum deliveries to Burnaby, the Westridge Marine Terminal for offshore export, and Sumas for deliveries on the Trans Mountain Pipeline (Puget Sound) LLC pipeline to Anacortes, Ferndale, and Cherry Point in Washington State.

[1] As of December 9, 2013.

6. In addition to pipeline facilities, the existing TMPL system includes 23 active pump stations along the pipeline route and four terminals at Edmonton, Sumas, Burnaby and Westridge. The number of tanks and capacity of each of these terminals is as follows:

- Edmonton: 35 tanks, capacity of 1,274,310 m^3 (8,015,000 bbl)
- Sumas: 6 tanks, capacity of 113,680 m^3 (715,000 bbl)
- Burnaby: 13 tanks, capacity of 267,900 m^3 (1,685,000 bbl)
- Westridge: 3 tanks, capacity of 62,800 m^3 (395,000 bbl)

7. Since its completion in 1953, various modifications have been made to the TMPL system to add throughput capacity and facilities in order to respond to growing demand and changing shipper needs. As a result, between 1957 and 2013, the capacity of the TMPL system gradually increased from 150,000 bbl/d to 300,000 bbl/d.

8. Kinder Morgan Canada Inc. (KMC) operates the TMPL system pursuant to an operating agreement between KMC and Trans Mountain.

Trans Mountain Expansion Project

9. In recent years, Trans Mountain has received numerous requests from shippers to address existing capacity constraints on the TMPL system and increase the capacity of the system to accommodate growing market demands for Canadian producers and marketers to access west coast and offshore markets. In October 2011, Trans Mountain commenced the first of three binding Open Season processes to obtain commitments from existing shippers on the TMPL system and other interested parties concerning their expressed desire to ship additional volumes on the TMPL system pursuant to firm service arrangements. The Open Season 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^3/d (707,500 bbl/d).

10. In June 2012, Trans Mountain filed a toll application with the NEB respecting the contract terms and toll structure that would be implemented for an expansion of the TMPL system. In May 2013, the Board approved these contract terms and toll structure in decision RH-001-2012. This decision, and the underlying contractual demand, provided Trans Mountain the necessary commercial support to proceed with this application to construct and operate the TMEP.

11. The Project will increase the capacity of the TMPL system to 141,500 m^3/d (890,000 bbl/d), and will comprise the following:

- Three segments of 914.4 mm (NPS 36) OD buried pipeline that complete a twinning (or “looping”) of the TMPL system in Alberta and BC, comprising a total of approximately 987 km as follows:

- Edmonton to Hinton – 339.4 km in length
- Hargreaves to Darfield – 279.4 km in length
- Black Pines to Burnaby – 367.9 km in length

- Reactivating two 609.6 mm (NPS 24) OD buried pipeline segments that have been maintained in a deactivated state:

  - Hinton to Hargreaves – 150 km in length
  - Darfield to Black Pines – 43 km in length

- Constructing two 3.6 km long 762.0 mm (NPS 30) OD buried delivery lines from the Burnaby Terminal to the Westridge Terminal (the Westridge delivery lines).

- Installing 23 new sending or receiving traps (16 on the Edmonton-Burnaby mainlines), for in-line inspection tools, at nine existing sites and one new site.

- Adding 12 new pump stations.

- Reactivating the existing Niton pump station, adding 1 pumping unit at the existing Sumas pump station, and deactivating some elements of existing Wolf and Blue River pump stations.

- Constructing 20 new tanks located at the Edmonton (5), Sumas (1) and Burnaby (14) Terminals, preceded by demolition of 2 existing tanks at Edmonton (1) and Burnaby (1), for a net total of 18 tanks to be added to the system.

- Constructing one new dock complex, with a total of three Aframax-capable berths, as well as a utility dock (for tugs, boom deployment vessels, and emergency response vessels and equipment) at the Westridge Marine Terminal, followed by the deactivation and demolition of the existing berth.

12. Ancillary facilities, including mainline block valves, scraper traps, pressure reduction or relief stations, and any required containment, as well as power lines and permanent access roads, may be required at one or more stations. The precise requirements and locations of these ancillary facilities will be determined through detailed design. Temporary infrastructure, such as access roads, construction camps, borrow pits/dugouts, stockpile sites and contractor yards, will also be required during construction.

13. Trans Mountain plans to minimize the potential environmental and negative socio-economic effects of the Project through paralleling existing linear facilities, where possible. Over the entire length of new buried pipeline segments associated with the Project, the proposed pipeline corridor is adjacent to

the existing TMPL easement for 722 km (73 per cent of the total length) and parallels other existing rights-of-way for a total of 170 km (17 per cent of the total length). Only 98 km (10 per cent of the total length) will be within a new pipeline corridor. Efforts to delineate a specific pipeline right-of-way within the applied-for corridor are continuing with ongoing community, landowner, and Aboriginal input. Detailed maps of the Project are provided in Volumes 4A and 6E.

14. The existing TMPL facilities, combined with the facilities proposed in this application, will result in two parallel pipelines:

- Line 1, consisting only of existing pipeline segments, will have a sustainable capacity of 55,640 m^3/d (350,000 bbl/d)

- Line 2, consisting of the three new pipeline segments and two reactivated existing segments, will have a sustainable capacity of 85,850 m^3/d (540,000 bbl/d)

15. The TMPL system will continue to operate as a batched pipeline system, allowing for transportation of light and heavy crude oils and refined products. If approved, the expanded Line 1 will continue to 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 normally provide a batched transportation service for heavy crude oils but will also be capable of transporting light crude oils.

16. Subject to approval by the Board, Trans Mountain intends to commence construction of the Project in late 2015, with commencement of service in December 2017.

17. The estimated capital cost of the Project is approximately $5.5 billion.

Project Purpose

18. The primary purpose of the Project is to provide additional transportation capacity for crude oil from Alberta to markets in the Pacific Rim including BC, Washington State, California, and Asia. The provision of enhanced access to growing Pacific Rim markets will provide a critical alternative market to Canadian crude oil producers. The additional capacity is required to meet both the needs of Trans Mountain's long-term contractual shippers and the general growth in demand for transportation service by all shippers.

Economics

19. The Project is underpinned by long-term binding contracts for firm transportation service on the TMPL system. The total contracted volume under firm service transportation agreements is 112,480 m^3/d

(707,500 bbl/d), which is approximately 80 per cent of the nominal capacity on the expanded system. The remaining capacity is reserved for uncommitted or spot shippers.

20. The firm service agreements provide for a sharing of risks between Trans Mountain and its shippers during the development stage of the Project, including construction, and the long-term operations of the expanded TMPL system. The tolling methodology and transportation contracts, as already approved by the Board, provide strong assurances that the expanded pipeline will be used at a high load factor during the lifetime of the firm contracts and beyond.

21. The long-term need for the Project is further supported by the future outlook of oil market supply and demand that Trans Mountain commissioned for this application (Volume 2.0, Appendix A). The forecasted supply and market demand growth, combined with robust contractual and financial underpinnings for the Project, ensures that the applied-for facilities will be used and useful over their economic life.

Project Benefits

22. The construction and operation of the Project will provide substantial economic and fiscal benefits to the parties directly involved in the Project, to all western Canadian oil producers, and to all Canadians and their governments. Construction of the Project is forecasted to boost Canadian Gross Domestic Product (GDP) by approximately $4.9 billion (constant $2012), with $2.8 billion accruing to BC and $1.4 billion to Alberta. During the first 20 years of operations, Canadian GDP is expected to increase by at least $13.3 billion, with $8.5 billion accruing to BC and approximately $4 billion to Alberta. In addition, federal tax revenues from the construction and operation of the Project are expected to be $2.1 billion, with provincial tax revenues of $1.7 billion. Property taxes generated by the Project will be approximately $22.1 million annually in BC and $3.2 million annually in Alberta.

23. There will be a total of 58,000 person-years of employment generated across Canada during construction of the Project, with approximately 36,000 in BC and 15,000 in Alberta. There will also be an overall boost to employment of 50,000 to 65,000 person-years during the first 20 years of operations, with 60 per cent of the jobs being created in BC and 20 per cent in Alberta.

24. Furthermore, oil producer revenues in Western Canada are forecast to rise by $45.4 billion over the first 20 years of the Project's operations, as a result of higher netbacks that can be attributed to producers having access to new markets through the Project. This revenue associated with higher netbacks is expected to generate total federal and provincial fiscal benefits of $14.7 billion, with Alberta receiving $8.2 billion and the federal government $6.1 billion.

Project Design and Operations

25. The Project will be designed, constructed and operated in accordance with the Onshore Pipeline Regulations (OPR) and Canadian Standards Association (CSA) Z662-11. If there are inconsistencies between the OPR and CSA Z662-11, the OPR will govern. In addition, the requirements of the latest version of industry codes, standards, specifications, and recommended practices will, where applicable, be incorporated into the design, construction, operation, and maintenance of the expanded TMPL system and its associated facilities.

26. KMC will continue to operate the TMPL system on behalf of Trans Mountain in accordance with KMC's corporate policies and practices. In particular, the expanded TMPL system will be operated and maintained in accordance with the KMC Integrated Safety and Loss Management System (ISLMS). The ISLMS has been developed in response to the 2013 amendments to the OPR, and applies to all activities involving the design, construction, operation, and abandonment of the TMPL system.

27. The expanded TMPL system, like the existing TMPL system, will be operated from the existing Primary Control Centre located in Sherwood Park, Alberta. The expanded TMPL system will be continuously monitored by KMC Control Centre Operators 24 hours per day using a Supervisory Control and Data Acquisition system.

Environmental and Socio-economic Assessment

28. The Project requires an environmental assessment under the *NEB Act*. In addition, as the proposed pipeline exceeds 40 km in length and will be regulated by the Board, the Project is a "designated project" under the Regulations Designating Physical Activities (October 2013) and is thus subject to the *Canadian Environmental Assessment Act, 2012* (*CEA Act, 2012*).

29. Trans Mountain retained TERA Environmental Consultants to conduct an Environmental and Socio-Economic Assessment (ESA) for the Project to meet the environmental assessment requirements of the *NEB Act* and *CEA Act, 2012*. The ESA is supported by environmental field studies and includes three preliminary environmental protection plans (EPPs) for the pipeline, associated facilities and Westridge Marine Terminal components of the Project. The Project EPPs will be updated as additional mitigation measures are identified during detailed design, and through the engagement process.

30. The ESA for the pipeline and facilities components of the Project concludes that the Project will not have a significant adverse effect on any biophysical or socio-economic element, provided the proposed mitigation measures are implemented. Some potential residual socio-economic effects are positive, particularly where related to increased business, employment opportunities and economic benefits. The ESA concludes that the Project will have two significant positive effects related to provincial

and national benefits and increased municipal taxes in local communities. The ESA for the marine transportation component of the Project concludes that the Project will not have a significant adverse effect on any biophysical or socio-economic element except the potential effect of sensory disturbance on southern resident killer whales that use the shipping lanes and the additional effect on traditional marine resource use (TMRU) by Aboriginal communities. While the Project's contribution to overall sensory disturbance effects to southern resident killer whales is small, the potential effect of the increase in Project-related marine vessel traffic is considered to be high magnitude, high probability and significant. With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. Port Metro Vancouver (PMV) is developing a collaborative multi-stakeholder program to look at the current levels of underwater noise in the Strait of Georgia and surrounding waters and to consider options for reducing potential cumulative environmental effects of noise from marine vessel traffic on marine mammals. Trans Mountain is strongly supportive of this regionally-focused, collaborative approach to managing cumulative effects of the marine transportation industry as a whole and will continue discussions with PMV to establish how to best participate in current and future initiatives on this topic aimed at reducing the existing effects on southern resident killer whales.

Land

31. During construction and installation of the Project, land rights will be required along the pipeline route and for the new above-ground facilities. Along the pipeline route, the average width of the construction footprint will typically be 45 m (includes an 18.3 m permanent right-of-way and temporary workspace [TWS]). The width of TWS will vary depending on the nature of terrain, construction season and on the specific features encountered or crossed by the pipeline. No additional permanent land is expected to be required at the four TMPL terminals (Edmonton, Kamloops, Sumas, and Burnaby). For the Westridge Marine Terminal, an expansion of the foreshore is expected to be needed, which will be approximately 1.4 hectares. In addition, acquisition of approximately 2.25 hectares of land for a new pump station and a small (less than 1 hectare in total) extension at each of the three existing pump station sites will also be required.

32. Trans Mountain will acquire the necessary easement interests, permits and rights from private landowners and through Crown License agreements in both Alberta and BC for the construction, operation, and maintenance of the Project. All land will be acquired with strict adherence to, and accordance with, the provisions and regulations of the NEB and, in particular, Section 87(1) of the *NEB Act*.

Consultation

33. Trans Mountain has embarked on an extensive program since 2011 to engage Aboriginal communities and to consult with landowners, government agencies (*e.g.*, regulators and municipalities), stakeholders, and the general public. As part of the stakeholder and Aboriginal engagement program, Trans Mountain has implemented, and continues to conduct, an open, extensive and thorough engagement process, including stakeholders and Aboriginal communities along the pipeline route as well as in coastal communities beyond the pipeline terminus at the Westridge Marine Terminal.

34. Project information has been shared with all potentially affected communities, communication and engagement activities are ongoing, and significant progress has been made in identifying potential effects of the Project and designing appropriate mitigation measures. Local contracting opportunities have been communicated, have occurred and will continue to occur. Community investment initiatives have also been implemented and will continue to be pursued.

35. To date, Trans Mountain has had more than 8,000 points of engagement with Aboriginal communities and Aboriginal groups relating to the Project. Trans Mountain has executed 46 agreements including Letters/Memorandums of Understanding, capacity funding, and integrated cultural assessments with an aggregate total dollar commitment to date for capacity funding in excess of $6 million. Additionally, a total of 37 communities have participated in Traditional Land Use studies, 9 communities in TMRU studies, and 28 communities in Traditional Ecological Knowledge studies. Trans Mountain understands that consultation is a process and not an event, and will be continuing its efforts to build positive long term relationships with the Aboriginal communities and Aboriginal groups that might have an interest in the Project or have Aboriginal interests potentially affected by the Project.

36. Trans Mountain's consultation for the Project to date is discussed in detail in Volume 3.0 of this application. Engagement activities will continue through the regulatory and construction phases of the Project, subsequent to the filing of this application.

Marine Transport

37. Trans Mountain does not own or operate the vessels calling at the Westridge Marine Terminal, however it is responsible for ensuring the safety of the terminal operations. Trans Mountain has been safely loading tankers and barges since 1953 from the Westridge Marine Terminal. Trans Mountain is responsible for and has internal standards and procedures relating to marine safety at the Westridge Marine Terminal including inspections and monitoring for each vessel. In addition, Trans Mountain works closely with PMV, Transport Canada, the Canadian Coast Guard, and other agencies to ensure the safety and efficiency of this traffic.

38. Although regulation and authorization of marine transportation is not specifically within the jurisdiction of the NEB, the environmental and socio-economic effects of the increased marine traffic associated with the Project has been considered by Trans Mountain in the ESA for the Project, as well as a quantitative marine risk assessment of the potential for oil spills in the marine environment. The results of these activities are incorporated in Volume 8A, Marine Transportation, and address the requirements of the NEB's List of Issues (NEB 2013a), *CEA Act, 2012*, and the NEB's Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project (NEB 2013b).

39. In addition, Trans Mountain is currently participating in Transport Canada's voluntary Technical Review Process of Marine Terminal Systems and Transshipment Sites (TERMPOL) process to address the increase in marine traffic to offload product from the Project. The TERMPOL process will take into consideration the operating systems and protocols associated with existing marine transportation, and examine the implications of the possible increase in marine vessel traffic to offload the product transported by the Project. Trans Mountain anticipates that the TERMPOL review process will be concluded before mid-2014, and will help inform the NEB regulatory process for the Project.

40. Although Trans Mountain's 60 year operating history and overall pipeline industry experience demonstrate that large pipeline and facility spills are unlikely to occur, concern about the effects of large spills was an issue that was frequently noted during Aboriginal engagement and consultation with landowners and stakeholders. The hypothetical pipeline and Westridge Marine Terminal spill scenarios provided in Volumes 7 and 8A are useful because they illustrate the types of environmental effects that might be observed as a result of a large unmitigated spill, however unlikely. More importantly, information from the credible worst case scenario evaluations will be important in planned undertakings to fully evaluate the existing Emergency Response Plans and develop necessary enhancements.

Application Content

41. Trans Mountain provides in this application information required for the consideration of a CPCN and other approvals, as reflected in Part III of the *NEB Act* and as outlined in the Board's Filing Manual. It also provides information required under Section 19(1) of the *CEA Act, 2012*.

Supporting Material

42. In support of this application, Trans Mountain provides and relies on the information attached to this application and any additional information that it may file, as directed or permitted by the Board.

Relief Requested

43. Trans Mountain requests that the Board:

- issue a CPCN, pursuant to Section 52 of the *NEB Act*, authorizing the construction and operation of the Project;
- issue an order, pursuant to Section 58 of the *NEB Act*, exempting Trans Mountain from the requirements of subsections 31(c), 31(d) and 33 of the *NEB Act* in relation to yet to be specified, select temporary lands or infrastructure required for construction of the Project; and
- grant such further and other relief as Trans Mountain may request or the Board may consider appropriate.

ALL OF WHICH IS RESPECTFULLY SUBMITTED.

Dated at the City of Calgary, in the Province of Alberta, this 16th day of December, 2013.

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Shawn H.T. Denstedt, Q.C.
Osler, Hoskin & Harcourt LLP
Counsel to Trans Mountain Pipeline ULC

1.1.2 Contact Information

All notices and communications relating to this application should be directed to:

Trans Mountain Pipeline ULC
Attention:
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Vice President, Finance & Regulatory Affairs
Kinder Morgan Canada
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AND TO:

Mr. Shawn H.T. Denstedt, Q.C.
Osler, Hoskin & Harcourt LLP
Suite 2500, 450-1st Street SW
Calgary, Alberta, T2P 5H1

1.2 Project Overview

Trans Mountain Pipeline is a Canadian corporation with its head office located in Calgary, Alberta. Trans Mountain is a general partner of Trans Mountain Pipeline L.P., which is operated by Kinder Morgan Canada Inc. (KMC), and is 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).

The TMPL system commenced operations 60 years ago and now transports a range of crude oil and petroleum products from Western Canada to locations in central and southwestern British Columbia (BC), Washington State and offshore. The TMPL system currently supplies much of the crude oil and refined products used in BC. The TMPL system is operated and maintained by staff located at Trans Mountain's regional and local offices in Alberta (Edmonton, Edson, and Jasper) and BC (Clearwater, Kamloops, Hope, Abbotsford, and Burnaby).

The TMPL system has an operating capacity of approximately 47,690 m^3/d (300,000 bbl/d) using 23 active pump stations and 40 petroleum storage tanks. The expansion will increase the capacity of the TMPL system to 141,500 m^3/d (890,000 bbl/d).

The proposed expansion will comprise the following:

- 994 km of new, buried pipeline segments that twin (or "loop") the existing pipeline in Alberta and BC (this includes 7 km of delivery line loops).
- New and modified facilities, including pump stations and tanks.
- Three new berths at the Westridge Marine Terminal in Burnaby, BC, each capable of handling Aframax class vessels.

The expansion has been developed in response to requests for service from Western Canadian oil producers and West Coast refiners for increased pipeline capacity in support of growing oil production and access to growing West Coast and offshore markets. NEB decision RH-001-2012 reinforces market support for the expansion and provides Trans Mountain the

necessary economic conditions to proceed with design, consultation, and regulatory applications.

Application is being made pursuant to Section 52 of the *National Energy Board Act* (*NEB Act*) for the proposed Project. The NEB will undertake a detailed review and hold a Public Hearing to determine if it is in the public interest to recommend a Certificate of Public Convenience and Necessity (CPCN) for construction and operation of the Project. Subject to the outcome of the NEB Hearing process, Trans Mountain plans to begin construction in 2015/2016 and go into service in 2017.

Trans Mountain has embarked on an extensive program to engage Aboriginal communities and to consult with landowners, government agencies (*e.g.*, regulators and municipalities), stakeholders, and the general public. Information on the Project is also available at www.transmountain.com.

Currently, in a typical month, five vessels are loaded with heavy crude oil at the terminal. The expanded system will be capable of serving 34 Aframax class vessels per month, with actual demand driven by market conditions. The maximum size of vessels (Aframax class) served at the terminal will not change as part of the Project. Similarly, the future cargo will continue to be crude oil, primarily diluted bitumen. Of the 141,500 m^3/d (890,000 bbl/d) capacity of the expanded system, up to 100,200 m^3/d (630,000 bbl/d) may be delivered to the Westridge Marine Terminal for shipment. While Trans Mountain does not own or operate the vessels calling at the Westridge Marine Terminal, it is responsible for ensuring the safety of the terminal operations.

In addition to tanker traffic, the terminal typically loads three barges with oil per month and receives one or two barges of jet fuel per month for shipment on a separate pipeline system that serves Vancouver International Airport (YVR). Barge activity is not expected to change as a result of the expansion.

Figure 1.2.1 illustrates the Project.

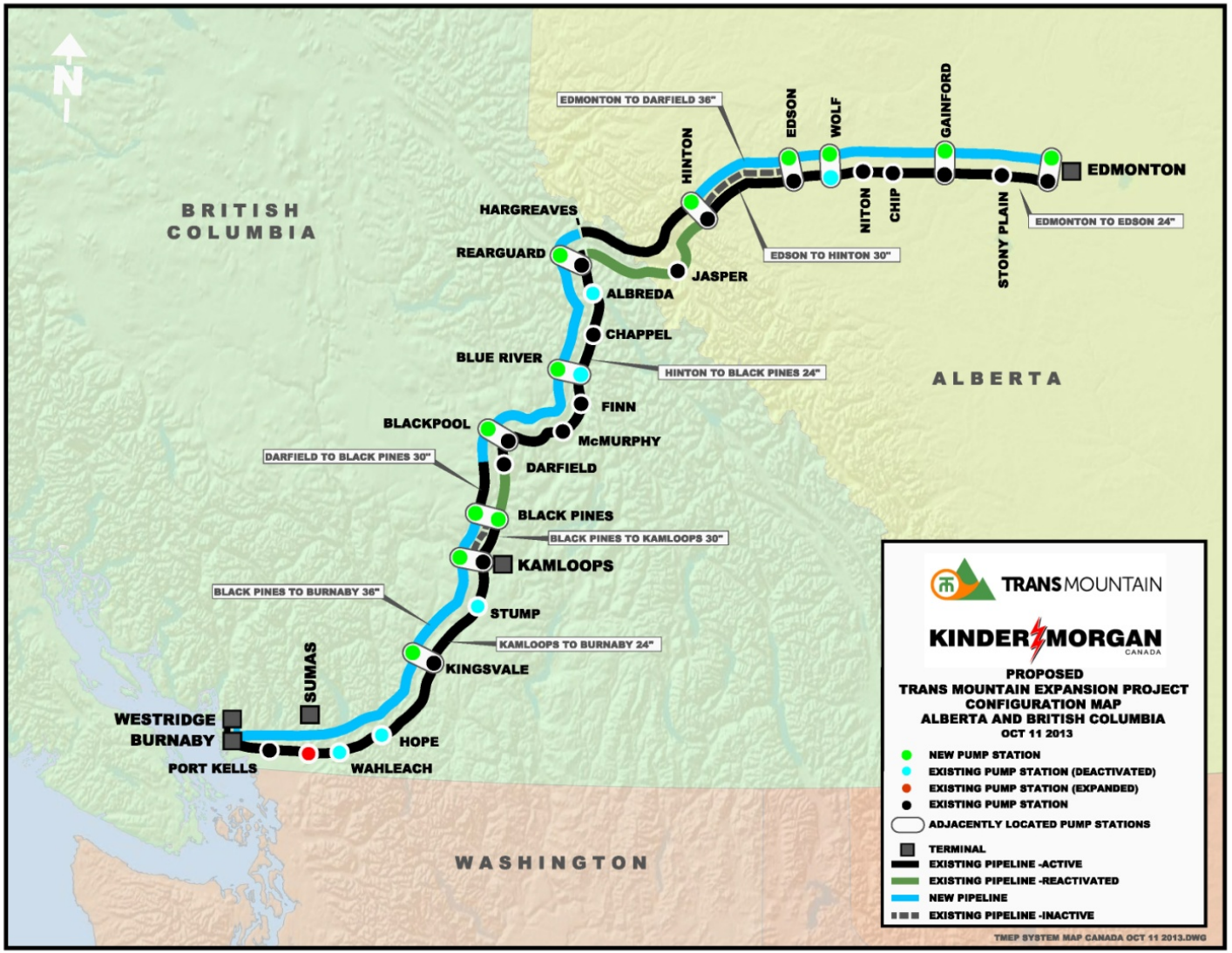


Figure 1.2.1 Project Configuration Map

1.3 Scope of the NEB Review

On May 23, 2013 Trans Mountain filed a Project Description with the NEB, the first formal step in a comprehensive federal regulatory process seeking approval of the Project. Based on the results of early consultation with interested parties that began in 2012, and in recognition of the high level of public interest and the transition to the *CEA Act, 2012*, Trans Mountain recommended the NEB treat TMEP as a "Designated Project" under the *CEA Act, 2012*.

In addition to the general guidance provided by the NEB for applicants in the NEB Filing Manual (NEB 2013c), the Onshore Pipeline Regulations (OPR), and the *CEA Act, 2012* the NEB issued two directives for the Project.

On July 29, 2013, the NEB released its List of Issues for the Project:

1. *The need for the proposed project.*
2. *The economic feasibility of the proposed project.*
3. *The potential commercial impacts of the proposed project.*
4. *The potential environmental and socio-economic effects of the proposed project, including any cumulative environmental effects that are likely to result from the project, including those required to be considered by the NEB's Filing Manual.*
5. *The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed Project, including the potential effects of accidents or malfunctions that may occur.*
6. *The appropriateness of the general route and land requirements for the proposed project.*
7. *The suitability of the design of the proposed project.*
8. *The terms and conditions to be included in any approval the Board may issue.*
9. *Potential impacts of the project on Aboriginal interests.*
10. *Potential impacts of the project on landowners and land use.*
11. *Contingency planning for spills, accidents or malfunctions, during construction and operation of the project.*
12. *Safety and security during construction of the proposed project and operation of the project, including emergency response planning and third-party damage prevention.*

The Board does not intend to consider the environmental and socio-economic effects associated with upstream activities, the development of oil sands, or the downstream use of the oil transported by the pipeline.

Although the NEB does not have regulatory jurisdiction over marine transportation, the potential environmental and socio-economic effects of the Project-related increase in tanker traffic have been included for consideration during the NEB review. Further to the List of Issues, the NEB

released The Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project on September 10, 2013 (NEB 2013b), clarifying the scope of the information requirements related to the marine aspects of the Project.

1.4 Structure of Application

The application was developed to meet multiple information needs and the NEB's regulatory requirements. Specifically, the application has been developed to meet the information requirements of:

- The NEB Filing Manual (NEB 2013c);
- The *CEA Act, 2012*;
- NEB List of Issues for the Trans Mountain Expansion Project (NEB 2013a); and
- The Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project (NEB 2013b).

The application was also developed to provide information and responses to Aboriginal communities and public stakeholders who continue to participate in the Aboriginal engagement and the public consultation programs.

The application is divided into 21 volumes as outlined in Table 1.4.1. A summary of each volume is provided in Section 2.0.

TABLE 1.4.1

SUMMARY OF APPLICATION CONTENT

Volume	Title
1	Summary
2	Project Overview, Economics and General Information
3A	Public Consultation
3B	Aboriginal Engagement
3C	Landowner Relations
4A	Project Design and Execution - Engineering
4B	Project Design and Execution - Construction
4C	Project Design and Execution - Operations and Maintenance
5A	Environmental and Socio-Economic Assessment - Biophysical
5B	Environmental and Socio-Economic Assessment - Socio-Economic
5C	Environmental and Socio-Economic Assessment - Biophysical Technical Reports
5D	Environmental and Socio-Economic Assessment - Socio-Economic Technical Reports
6A	Environmental Compliance
6B	Pipeline Environmental Protection Plan

TABLE 1.4.1

SUMMARY OF APPLICATION CONTENT (continued)

Volume	Title
6C	Facilities Environmental Protection Plan
6D	Westridge Marine Terminal Environmental Protection Plan
6E	Environmental Alignment Sheets
7	Risk Assessment and Management of Pipeline and Facility Spills
8A	Marine Transportation
8B	Marine Environmental and Socio-Economic Technical Reports
8C	TERMPOL Reports

Each volume is presented with:

- a guide, illustrating to readers at which point they are in the application;
- the NEB Checklist, showing reviewers where NEB Filing Manual information requirements have been met in the application; and
- a *CEA Act, 2012* Concordance Table, showing reviewers where environmental and socio-economic effects assessment requirements have been met in the application.

2.0 SUMMARY AND CONCLUSIONS

Section 2.0 is an overview of each volume of the application, focusing on the key messages and conclusions included therein. Given the importance of potential Project-related effects, and because the environmental assessment is found in more than one volume, the summary of the Environmental and Socio-Economic Assessment (ESA) of the Project and Project-related marine aspects is provided in Section 3.0 of this volume.

2.1 Project Overview, Economics and General Information (Volume 2)

2.1.1 The Applicant

The Trans Mountain Pipeline system began transporting crude oil in 1953, ushering in a new era of economic growth in western Canada. Originally designed to transport just crude oil, the pipeline was later modified to allow customers to also ship refined products and production from Alberta's (AB's) oil sands. The TMPL system has been transporting crude oil from the oil sands since the late 1980s.

Kinder Morgan, through its operating company KMC, has owned and operated the TMPL since 2005. Trans Mountain is the holder of the operating certificate from the NEB for the TMPL and is the applicant for the Project.

Across all its operations, Kinder Morgan strives to provide for the safety of the public, its employees and contractors; protect the environment; comply with applicable laws, rules, regulations, and permit requirements; and operate and expand efficiently and effectively to serve our shareholders and customers. The Operations Management System plays a critical role in setting the objectives and expectations for all these activities. Individual business unit operations including those of KMC, its maintenance procedures, and site-specific procedures are designed to meet these objectives and expectations.

Trans Mountain and KMC are experienced in the effective design, construction and operation of projects in challenging environments. For example, the TMX - Anchor Loop Project required construction through Jasper National Park in Alberta and Mount Robson Provincial Park in BC, both of which are part of the United Nations Environmental, Scientific and Cultural Organization Canadian Rocky Mountain Parks World Heritage Site. In recognition of this setting and through consultation with Aboriginal communities, stakeholders and various government agencies, Trans Mountain implemented a number of unique and innovative restoration measures at particularly sensitive areas, with the objective of restoring ecological integrity of these lands and watercourses. Following construction of the TMX - Anchor Loop Project, Trans Mountain reported on the effectiveness of mitigation and restoration that was implemented during and following construction as outlined in the Environmental Protection Plan (EPP) and Restoration Plan for the Project. Many of the successes identified during post construction monitoring can be attributed to the implementation of those mitigation measures outlined in the plans. The mitigation measures were successful at achieving the desired end results and management objectives of Parks Canada (TERA Environmental Consultants [TERA] 2013). The TMX - Anchor Loop Project is viewed by many as a legacy project, and has achieved a level of success that has exceeded expectations in many areas. This project proved that an oil pipeline can be constructed, maintained and operated in a highly valued ecological and historical setting of international importance. Many of the approaches, plans and programs which were implemented on the TMX - Anchor Loop Project have been adapted and enhanced for the TMEP.

KMC will continue to operate the TMPL system on behalf of Trans Mountain. Trans Mountain accepts that KMC applies its own corporate policies and practices in its operations of the TMPL system, and will continue to do so for the expanded TMPL system if the Project is approved. In particular, the expanded TMPL system will be operated and maintained in accordance with the KMC Integrated Safety and Loss Management System (ISLMS). The ISLMS has been developed in response to the 2013 amendments to the OPR, and applies to all activities involving the design, construction, operation, and abandonment of the TMPL system.

KMC, as the operator of the TMPL system, is committed to operating in a manner that minimizes adverse environmental effects and ensures that operations comply with all environmental legislation, permits, and regulatory agency requirements. Safety and environmental requirements will be incorporated into all business decisions and operational activities for the Project. The expanded TMPL system will be operated and maintained by KMC in accordance with the KMC ISLMS. A key component of the ISLMS is the KMC Environment, Health, and Safety Policy:

> *"Environment, Health and Safety Policy*
>
> *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."*

2.1.2 Regulatory Framework

The Project will require a CPCN pursuant to Section 52 of the *NEB Act* to permit construction and operation of the expanded TMPL system. A comprehensive ESA and a public hearing is required as part of the NEB regulatory process for the Project. The recent NEB Reasons for Decision RH-001-2012 concerning Trans Mountain's tolls and tariff application provides the financial grounding that Trans Mountain sought to proceed with this application under Section 52 of the *NEB Act*. The NEB Section 52 application constitutes Trans Mountain's formal application to the NEB seeking approval for the Project. The Section 52 application forms the basis for the regulatory process and public hearing for the Project.

In addition to seeking a certificate under the *NEB Act* to construct and operate the Project, other federal permits and approvals may be required for certain construction activities to proceed. The Project is federally regulated and subject to obtaining a CPCN from the NEB and complying with

the conditions imposed by the NEB. Trans Mountain intends to work with provincial and municipal regulatory agencies to provide them the information they need to fulfill their permitting requirements.

In addition to the federal authorizations, Trans Mountain is participating in Transport Canada's voluntary Technical Review Process of Marine Terminal Systems and Transshipment Sites (TERMPOL) process to address the increase in marine traffic to offload product from the Project. The TERMPOL process will take into consideration the operating systems and protocols associated with existing marine transportation, and examine the implications of the possible increase in marine vessel traffic to offload the product transported by the Project. This is an operational review process led by a federal interdepartmental committee 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.

2.1.3 Project Description

The physical components of the Project include:

- installation of new pipeline segments and reactivation of existing lines that are current maintained in a deactivated state;
- construction of pump stations;
- expansion of existing terminals by the addition of new tanks and other infrastructure and construction of a new dock complex at Westridge Marine Terminal;
- installation of new mainline block valves; and
- addition of new power lines under the jurisdiction of the appropriate provincial authorities.

2.1.3.1 Pipeline

The major components of the pipeline portion of the Project include:

- using existing active 610 mm (NPS 24) and 762 mm (NPS 30) OD buried pipeline segments;
- reactivating two 610 mm (NPS 24) OD buried pipeline segments that have been maintained in a deactivated state:
  - Hinton to Hargreaves – 150 km;
  - Darfield to Black Pines – 43 km;

- constructing three new 914 mm (NPS 36) OD buried pipeline segments totaling approximately 987 km:
  - Edmonton to Hinton – 339.4 km;
  - Hargreaves to Darfield – 279.4 km;
  - Black Pines to Burnaby – 367.9 km; and
- constructing two parallel 3.6 km long 762 mm (NPS 30) OD buried delivery lines from the Burnaby Terminal to the Westridge Marine Terminal.

The Project will result in two continuous pipelines between Edmonton and Burnaby:

- Line 1 will have a sustainable capacity of 55,640 m^3/d (350,000 bbl/d); and
- Line 2 will have a sustainable capacity of 85,850 m^3/d (540,000 bbl/d).

To minimize environmental and socio-economic effects and facilitate efficient pipeline operations, use of the existing TMPL 18.3 m wide right-of-way will be maximized. Where it is not possible to align along the existing TMPL right-of-way, construction along other linear facilities was evaluated including other pipelines, power lines, highways and roads, railways, communication lines and other utilities.

2.1.3.2 Pump Stations

New electrically-powered pump stations located at regular intervals along the TMPL system will be added as part of the Project. The major components of the pump station portion of the Project which support mainline operation include:

- adding 35 new pumping units at 12 locations (*i.e.*, 11 existing and one new pump station site); and
- deactivating some elements of existing Wolf and Blue River pump stations.

The TMEP pump stations, like those in the existing TMPL system will be remotely operated and continuously monitored by a Control Centre Operator (CCO) using the Supervisory Control and Data Acquisition (SCADA) system at the Primary Control Centre in Sherwood Park, AB. In the event of an emergency, an emergency shut-down (ESD) can shut down pump units and close the pump station suction and discharge valves. The ESD systems initiate automatically in the case of certain abnormal conditions. In addition, the CCOs will be able to use the expanded TMPL SCADA system to shut down mainline pumps and booster pumps, close pump station and terminals valves and close remote mainline block valves (RMLBVs).

2.1.3.3 Terminals

The major components of the associated facilities of the Project include:

- constructing 20 new tanks at the Edmonton (5), Sumas (1) and Burnaby (14) terminals, preceded by the demolition of 2 existing tanks at Edmonton (1) and Burnaby (1), for a net total of 18 tanks to be added to the system; and
- constructing a new dock complex, with a total of three Aframax-capable berths, as well as a utility dock (for tugs, boom deployment vessels, and emergency

response vessels and equipment) at the Westridge Marine Terminal, followed by the deactivation and demolition of the existing berth.

All terminals, with the exception of Sumas Terminal, which is designed for fully remote operation, will continue to have operations staff on site at all times. Tanks will be placed within secondary containment areas and will be fitted with fire-protection systems. Tanks, pumps, motors, piping, and other components will also be protected by sophisticated control and ESD systems.

2.1.3.4 Mainline Block Valves, Sending/Receiving Traps

Remote mainline block valves and sending/receiving trap facilities are important components for the safe operation and long-term integrity of pipelines. RMLBVs will complement mainline block valves, which are located at the pump stations.

Seventy-two new buried RMLBVs will be installed on Line 2. RMLBV sites are typically 5 m × 12 m and will be located within the right-of-way. Twenty-one new buried check valves will also be installed on Line 2. Preliminary RMLBV site locations have been identified with final locations to be established during the detailed engineering and design phase.

A total of 23 new sending or receiving traps for in-line inspection (ILI) tools will be installed at facility locations along the pipeline, involving nine existing sites and one new site.

2.1.3.5 Power Lines and Access Roads

The environmental and socio-economic effects of new utility power lines for the Project have been considered by Trans Mountain and authorizations for construction and operation will be sought from the appropriate provincial authorities. New 25 kV or 138 kV power lines will be constructed to supplement the electric power supply to three existing pump station sites (Edmonton, Edson, and Kingsvale) and to provide a new power supply to one new pump station site (Black Pines). Electrical power will also be required at each automated RMLBV site and at cathodic protection system rectifier locations.

A permanent access road will be required for the new Black Pines Pump Station; which will be located less than 0.5 km from the nearby road. Permanent access roads may also be required for the RMLBV or cathodic rectifier sites and a secondary emergency only access road may be considered for Westridge Marine Terminal.

2.1.4 Project Need

The primary purpose of the Project is to provide additional transportation capacity for crude oil from Alberta to markets in the Pacific Rim including BC, Washington State, California, and Asia. The provision of enhanced access to growing Pacific Rim markets will provide a critical alternative market to Canadian crude oil producers. The additional capacity is required to meet both the needs of Trans Mountain's long-term contractual shippers and the general growth in demand for transportation service by all shippers.

The demand for transportation services exceeds the current TMPL system capacity and has resulted in the ongoing need to apportion the available capacity. This has also affected the quality of common carriage, as shippers have experienced increasing uncertainty that they will have adequate access to capacity on a month-to-month basis.

The need for the Project has also been strongly demonstrated by the long-term financial commitments shippers have made through entering into firm contracts for 80 per cent of the nominal capacity on the expanded system. The tolling methodology, including all aspects of the transportation service agreements, was approved by the Board in its Reasons for Decision RH-001-2012, released on May 13, 2013. It can be reasonably assumed that shippers would not have freely entered into these contracts, which obligate them to make substantial financial commitments on a take-or-pay basis over the lifetime of their contracts, if they were not convinced of the need for the Project and that they would utilize the capacity.

Beyond the needs of the contracting shippers, there is a need for the Project to meet the demands of spot shippers. There are shippers that have a requirement to move crude oil and products to markets, but did not for their own reasons, commit to firm contract space. The expanded pipeline system will reserve 20 per cent of the total nominal capacity on a spot basis for those shippers.

More generally, the Project is required to provide needed flexibility for Western Canadian producers. Oil markets are continually subject to changing market conditions, refinery shut-downs, supply interruptions and other events that impact markets. In order for Western Canadian producers to obtain access to the highest value markets, sufficient pipeline capacity to alternative markets is required.

Finally, the Project is required from a broader public interest perspective to ensure that producers and governments obtain the highest value for their petroleum resources. Canadians are the ultimate owners of petroleum resources as represented through their provincial governments. The Canadian public is deprived of receiving the full market value for these resources when it is not possible to access the highest value end markets.

2.1.5 Pipeline Routing and Facility Siting

Early in the Project planning process, Trans Mountain determined that the new pipeline segments should be contiguous with the existing 18 m wide TMPL easement to the greatest extent practical to minimize environmental and socio-economic effects and facilitate efficient pipeline operations. While this was determined to be possible for over 70 per cent of the distance, it was not possible in all locations.

Looping (“twinning”) of the 1,147 km existing TMPL from Edmonton to Burnaby will require construction of 987 km of new mainline pipeline and two, parallel 3.6 km delivery lines from Burnaby Terminal to Westridge Marine Terminal. The new pipe segments will be within a proposed corridor on or adjacent to the existing 18.3 m wide TMPL easement (including areas where other linear facilities have pre-empted TMEP from being directly contiguous with the original TMPL easement) for 722 km, or 73 per cent of the total length. Approximately 170 km (17 per cent) follows beside other existing rights-of-way, making for a total parallel length of 892 km (90 per cent). A total of 98 km (10 per cent) of the TMEP will be on new corridor.

In general, the existing TMPL terminals and pump station sites are sufficiently large to accommodate TMEP facilities. The two pump stations at Black Pines, approximately 38 km north of Kamloops, will require a new site approximately 150 m × 150 m (2.25 ha) in size.

Three candidate sites are under consideration with the preferred location to be finalized in early 2014.

In addition, a small extension to the foreshore area at the Westridge Marine Terminal will be required.

2.1.6 Land Matters

Trans Mountain will acquire the necessary easement interests, permits and rights from private land owners and Crown License agreements in both Alberta and BC for the construction, operation, and maintenance of the Project. Private landowners and the Crown have been engaged by Trans Mountain as part of the Landowner Engagement Program (see Section 2.4 in this volume and Volume 3C).

The summary in Table 2.1.1 provides an estimate of the land required for the Project at this time. The actual quantity of land will be determined at completion of detailed engineering design and construction planning.

TABLE 2.1.1

LAND AREA SUMMARY

Requirements	Alberta		BC	
	Area (ha)	**Comment**	**Area (ha)**	**Comment**
Right-of-Way	621.2	18.3 m wide combination of existing TMPL and new right-of-way. Proportion to be determined following engineering design.	1,178.9	18.3 m wide, combination of existing TMPL and new right-of-way. Proportion to be determined following engineering design.
Temporary Work Space (TWS)	906.2	Average 26.7 m wide.	1,726.8	Average 26.7 m wide.
Temporary Construction Lands	26.0 (min)	Total is undetermined at this time.	50.0 (min)	Total is undetermined at this time.
Pump Stations	0.3 (min)	Total is undetermined at this time.	3.02 (min)	Total is undetermined at this time.
Pump Stations Temporary Workspace		Undetermined at this time.		Undetermined at this time.
Power Lines	0.3 (min)	Total is undetermined at this time.	129.5	Total is undetermined at this time.
Subtotal	1,554		3,088	
Total	**4,642 ha**			

2.1.7 Project Schedule

Subject to receiving the necessary regulatory approvals, plans provide for the pipeline segments to be constructed over three seasons: summer 2016; winter 2016/2017; and summer 2017 (Volume 4B provides details). In this context, the summer construction seasons will extend from May through October and the winter construction season will extend from November to April. Preparatory work for pipeline construction will begin in October 2015. Work on the facilities will take place starting in the late fall of 2015 and continue through 2017. A master schedule is provided in Figure 2.1.1. The Project workforce is expected to peak at approximately 4,500 workers. The schedule is predicated on receipt of a CPCN by mid-2015 to allow for the final decision by Trans Mountain to proceed with the Project, the ordering of materials, securing provincial and local permits, utilizing the upcoming construction windows, and the awarding of major contracts.

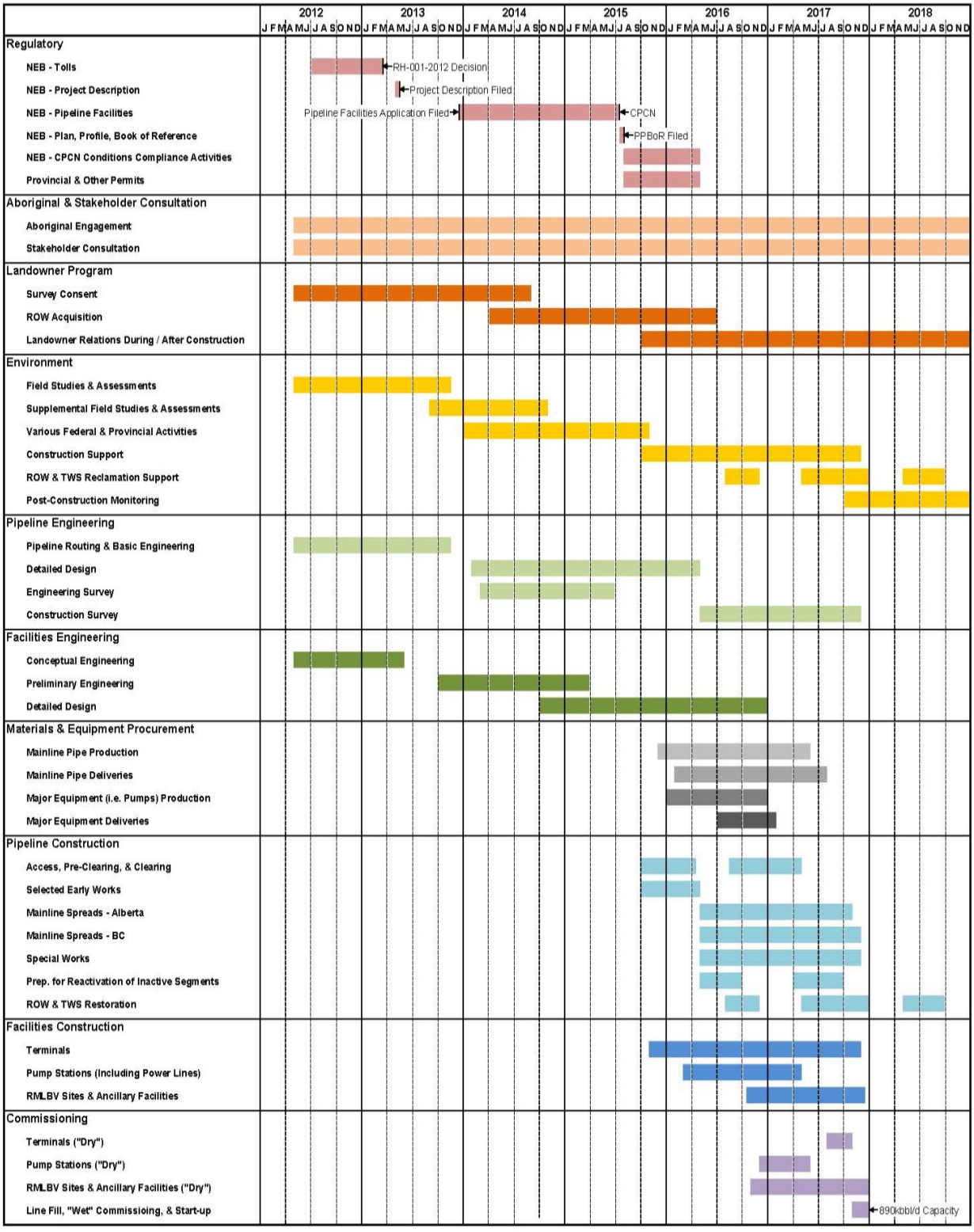


Figure 2.1.1 Master Project Schedule

2.1.8 Project Cost Estimate

The $5.5 billion capital cost estimate (exclusive of the firm service fee credit) for the TMEP was included in NEB Decision RH-01-2012. The cost estimate has been re-sorted in Table 2.1.2 to be generally consistent with the breakdown indicated in the NEB Filing Manual. The cost estimate will be updated for the purpose of toll calculations at the conclusion of the regulatory proceedings and prior to the start of construction. The expected capital cost for the Project is approximately $5.5 billion. Financing will be arranged by Trans Mountain's parent company KMP.

TABLE 2.1.2

PROJECT COST ESTIMATE

Item	Estimate (M$)*
Project Management	192.3
Engineering, Survey, and Environment	252.6
Pipeline Materials	674.7
Right-of-way and Other Land Costs	370.0
Pipeline Construction and Reactivation	2,267.6
· New Construction	2,217.7
· Reactivation	49.9
Facilities Materials and Construction	1,332.2
· Pump Stations	440.6
· Terminals	861.2
· Other Facilities	30.4
Other	94.6
Subtotal	**5,184.0**
AFUDC	322.3
Total	**5,506.3**

Note: *as spent Canadian dollars

2.2 Public Consultation (Volume 3A)

Section 2.2 is a summary of the Project Public Consultation Program, commonly referred to as stakeholder engagement. The full details of the stakeholder engagement program are provided in Volume 3A.

For the purpose of this application, unless otherwise stated, the feedback reported in Volume 3A includes engagement activities conducted from May 2012 through to July 31, 2013. Updates to engagement initiatives that continue to occur, and which will continue through the regulatory process, will be provided periodically to the NEB.

2.2.1 Vision

When developing the Project stakeholder engagement program, the Project team adopted KMC's Community Relations philosophy, which states:

> *"At KMC, we believe Aboriginal communities, our neighbours, governments and local communities play an important role in how we conduct our business. Our*

success depends on earning the trust, respect and cooperation of all community members.

We are committed to respectful, transparent and collaborative interactions with communities to develop long-term effective relationships. To honour this commitment, we participate in local communities by hosting open houses, providing newsletters and Project updates, making safety and public awareness presentations, participating in community events, regulatory processes, and informal meetings."

2.2.2 Principles and Goals

The Project stakeholder engagement program 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 continued development and execution of the stakeholder engagement program:

- **Accountability** – Address issues as they emerge. Trans Mountain believes that effective problem solving and mitigation strategies can be identified through engagement with stakeholders.
- **Communication** – Facilitate the involvement of stakeholders; listen and gather input, and work collaboratively to resolve concerns. Use multiple channels for communication to meet the communication needs of diverse stakeholder groups.
- **Local focus** – Seek local input and understanding of the region, its people, the environment, and reflect local values and attitudes in communications with stakeholders.
- **Mutual benefit** – Seek solutions to challenges that result in shared benefits for all interests.
- **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.
- **Respect** – Respect individual values, recognize the legitimacy of concerns, and value the stakeholder input.
- **Responsiveness** – Utilize input and, where feasible, provide timely feedback to stakeholders on how their input has affected plans and decisions.
- **Shared process** – Design the Project stakeholder engagement program based on public input, taking into consideration various stakeholder group interests, knowledge levels, time, and preferred method of engagement.
- **Sustainability** – Report on social, environmental and economic concerns raised, and identify how concerns might be addressed.
- **Timeliness** – Initiate engagement processes as early as possible to provide adequate time for stakeholders to assess information and provide input.

- **Transparency** – Commitments made to stakeholders will be documented and carried out. When Trans Mountain is unable to act on input, an explanation will be provided.

2.2.3 Design of Stakeholder Engagement Program

Trans Mountain has implemented, and continues to conduct an open, extensive and thorough stakeholder engagement program which was designed to foster participation from those who have an interest in the scope, activities, and routing of the Project. The program sought meaningful input regarding the proposed pipeline corridor; environmental effects, and socio-economic effects and benefits. In addition to communicating timely information on the Project, Trans Mountain has also provided, and will continue to provide, information on how stakeholders can provide comments to the NEB prior to a project decision.

The stakeholder engagement program focused on pipeline corridor communities (those affected by the proposed pipeline and related facilities) and marine corridor communities (those potentially affected by the incremental increase in Project-related marine vessel traffic). Engagement in pipeline communities has broadly discussed the greater terrestrial (pipeline) impacts, and in the coastal communities, efforts have focused on maritime matters related an increase in tanker traffic and the expansion of Westridge Marine Terminal.

Through early discussions with local governments and community leaders, Trans Mountain identified stakeholders that may have an interest in the Project including government authorities, Environmental Non-governmental Organizations (ENGOs), special interest groups, industry, and the general public. In addition the program has been developed to be sufficiently flexible to allow for the identification of new information and additional stakeholders.

2.2.4 Communication Methods and Opportunities

A variety of communication initiatives supported the Project stakeholder engagement activities including:

- **Comprehensive Website** (www.transmountain.com) - Launched on May 29, 2012, the website provided an overview of all facets of the Project, copies of all Project materials, and identified communication methods for contacting Project representatives. The most popular pages include the *Homepage*, *Have Your Say* (previously called *Talk Trans Mountain*), *Proposed Expansion*, *Current Operations*, and *Route*. The website has been and continues to be a living communications tool, and continues to expand on a weekly basis.

- **Website Forum** - Trans Mountain hosted and continues to host a forum on the website where visitors can ask questions. As questions are submitted, they are put in a queue to be answered publicly or privately. Between October 25, 2012, and July 18, 2013, 87 questions were answered publicly on the website, 22 were answered privately via email, and 11 were comments not requiring an answer.

- **Trans Mountain Updates** - To provide timely updates or news about the Project, the Project team frequently published short stories or backgrounders on the Project website; prominently promoted on the website homepage. When applicable this information was distributed via the Project's Twitter account and to the media through the media relations program.

- **Phone Line and Email** - A toll-free phone line and a Project email address were both launched on May 29, 2012. Both the toll-free phone line (1.866.514.6700) and the email address (info@transmountain.com) are staffed during regular business hours. Trans Mountain has committed to providing responses to stakeholder inquiries in a timely manner. Trans Mountain has committed to providing responses to stakeholder inquiries in a timely manner. Between May 29, 2012, and July 31, 2013, approximately 33 phone line inquiries and 83 emails were received and responded to.

- **Trans Mountain Project Business Card** - A general Project business card was produced for use at various events such as speaking engagements and open houses, and other interactions with stakeholders. The general Project business card was also provided to all Trans Mountain operations staff and all Project field staff. The card provides a quick reference to key Project contact information (phone and email) for public and media inquiries.

- **E-blasts** - The stakeholder engagement program provides updates by email called E-blasts. The email list of over 1,500 stakeholders to date is generated from people who indicated on the Trans Mountain website, at public events, or meetings, their interest in receiving Project updates. Trans Mountain adheres to both BC's and Alberta's *Personal Information Protection Act* in collecting this information and participants have the freedom to unsubscribe at any time. Since May 2012, Trans Mountain has sent out five E-blasts to participants on the email list.

- **Field Studies** - During the two field study seasons held between May 2012 and July 2013, Trans Mountain placed advertising in local newspapers along the Project proposed pipeline corridor to notify people that environmental studies associated with the Project were taking place. In addition, a four-page brochure was produced in June 2012, to outline the various field studies associated with the Project. Copies were distributed at open houses, by mail to landowners along the pipeline corridor and on the website.

- **Project Update Newsletters** - Between May 1, 2012, and July 31, 2013, Trans Mountain produced four newsletters that provided updates to Project information and a summary of recent activities. These were distributed to stakeholders and available at public events and meetings and are also available on the Project's website. A link to the website was provided in the relevant E-blasts.

- **Kinder Morgan Canada Publications** - General information about the proposed Project has regularly appeared in KMC publications such as corporate brochures and company newsletters. Before the Project was announced in April 2012, the KMC Energy Pathways community newsletter included a letter to residents around the Burnaby, BC, Terminal outlining a possible expansion.

- **Community Events** - Trans Mountain representatives took the opportunity to attend community events between April 1, 2012, and July 31, 2013. Community events provided a forum for direct contact with stakeholders, and for people to meet Project staff and ask questions about the Project or engagement

opportunities. Attending these events provided an opportunity for direct contact with stakeholders.

- **Speaking Opportunities** - Trans Mountain representatives participated in marine-related forums, panel discussions, and presentations between April 1, 2012, and July 31, 2013, to a wide variety of stakeholders. These events offered Trans Mountain an opportunity to outline Project details to various audiences and answer questions.

To broaden the reach of the stakeholder engagement program and expand upon the methods identified in the NEB Filing Manual (NEB 2013c), Trans Mountain provided the following in parallel to the in-person engagement opportunities:

- **Twitter** - In September 2012, the @TransMtn Twitter account was launched. The Twitter account was used and continues to be used to distribute messaging about the Project, drive traffic to the website, and promote open houses and online engagement tools. Between August 13, 2012, and July 31, 2013, 1,530 tweets were sent by @TransMtn. As of July 31, 2013, the @TransMtn Twitter account had 591 followers.

- **YouTube** - On February 14, 2013, Trans Mountain launched a Project-specific YouTube channel located at http://www.youtube.com/user/TransMtn. As of July 31, 2013, 12 videos about the Project had been posted generating a total of 9,278 views and 1,775 estimated minutes watched.

- **Social Media Business Card** - Trans Mountain produced a social media card in May 2013, to provide the public with information on social media profiles. This card, the size of a typical business card, was used as an additional way to invite people to connect with the Project.

2.2.5 Media Relations

To respond to incoming media inquiries in a timely and efficient manner, Trans Mountain initiated a media relations program in May 2012, with dedicated Project media phone numbers 604.908.9734 and 855.908.9734, and a media email address (media@transmountain.com).

Trans Mountain reached out to media outlets with invitations to public open houses as well as offered pre-briefing sessions. Media contacts included newspapers, magazines, radio stations, and TV stations. Trans Mountain offered media kits that contained the Project discussion guide, media backgrounder, feedback form, and the most recent Project update. Project spokespeople were available for interviews. As well, other subject-area expert spokespeople were available for interviews covering topics including stakeholder engagement, routing, Aboriginal engagement, and regulatory matters as well as providing accurate Project information.

2.2.6 Stakeholder Engagement Activities

Trans Mountain adopted a phased approach to stakeholder engagement. Each phase has been further developed and refined in response to information gathered from the previous phase as well as identified interests and needs. The Project Stakeholder Engagement Program consists of six phases.

2.2.6.1 Phase 1 Engagement: Stakeholder and Issue Identification (May – September 2012)

The first phase of engagement focused on Project introduction, identifying interested stakeholders, and identifying locally-appropriate means for engagement. Trans Mountain provided information through mail, email, and website posts as well as hand delivering information to stakeholders at Project introduction meetings.

A mail-out to municipal governments, members of the legislative assemblies, and members of parliament along the proposed pipeline corridor and in marine communities took place between June 12, 2012, and July 20, 2012. Materials in the mail-out included a letter introducing the Project, notification of the Toll Application for the Project that was filed with the NEB on June 29, 2012, an overview of summer field activities, a Project Update newsletter (June 2012), and a Field Studies brochure.

Project introduction meetings were offered to stakeholders near the pipeline and marine corridors who expressed an interest in the Project. Stakeholders indicated how and when they preferred to be engaged. Trans Mountain also received recommendations on seeking input from other individuals or groups. By September 2012, meetings had been held with 89 Municipal Governments, 25 Federal Government representatives, 34 Provincial Government representatives, and 165 other organizations or individuals including chambers of commerce, local interest groups, and environmental organizations.

In an effort to best inform the ESA, engagement with environmental groups was formally initiated in April 2012, beginning with key sustainability opinion leaders, clean technology proponents, and environmentalists.

2.2.6.2 Phase 2 Engagement: Public Information and Input Gathering (October 2012 to January 2013)

Phase 2 continued the outreach and discussions with municipalities and other stakeholders. Trans Mountain focused on engaging stakeholders through open house sessions and through conversation, feedback forms, online discussion, and Project-specific social media accounts.

2.2.6.2.1 Public Open House Format

Between October 2012 and January 2013, Trans Mountain implemented an advertising campaign to notify stakeholder about upcoming open houses and online opportunities to provide feedback. The campaign consisted of print advertising supplemented with online advertising and direct mail postcard drop. Trans Mountain also posted the date and details of each open house on the Project website at least two weeks in advance, and tweets were issued on the Twitter account (@TransMtn) leading up to events. In some communities, Trans Mountain posted the links to event information on the municipal website and posted flyers in community spaces.

From November 19, 2012, to December 9, 2012, Trans Mountain ran online banner advertising to encourage click-through of the online engagement forum. This advertising was geographically targeted to website views coming from Alberta and BC along the proposed pipeline and marine corridors. During the three weeks these advertisements were in the marketplace, they generated 9,617 click-throughs and almost 10.5 million impressions (counted as every time the advertisement is shown on a webpage).

Starting in October 2012 and continued to mid-January 2013, Trans Mountain held 37 open houses in 30 communities along the proposed pipeline and marine corridors. The sessions were

structured as drop-in events where stakeholders were provided information, and asked questions about the Project. Company management and technical experts including representatives from marine biological science, maritime navigation and industry, environment, routing, geotechnical, regulatory, operations, stakeholder engagement, and media relations were on hand to answer questions, and receive comments and concerns from attendees.

Trans Mountain produced a Discussion Guide for the open houses that provided a summary of key Project information. The Discussion Guide was available for attendees during their interactions with Project team members and for them to take away. Over the course of the 37 public open houses in 30 communities, approximately 2,500 Discussion Guides were distributed. The guide (in English, French and Chinese) is available for download on the Trans Mountain website (http://www.transmountain.com/information-materials).By having the guide available on the website, online access to the same information was provided to those who were unable to attend the open houses.

Following the open houses, Trans Mountain has updated this guide throughout the Project and renamed it, Information Guide. In addition to providing updated Project information, the guide provides information to stakeholders on three methods to which they can comment to the NEB prior to a Project decision. This includes:

- filing a letter of comment: a written statement about the writer's views;
- with advanced notice to and approval from the NEB, asking to make an oral statement; presenting views in-person at a public hearing; and
- applying for intervenor status: an individual or group granted intervenor status by the NEB may file written evidence, receive all filling submitted by the company, comment on evidence filed, and make a final argument.

Attendees at the public open houses were provided with feedback forms and were encouraged to provide completed forms to Project representatives or at a later date by mail, email, facsimile, or through the digital engagement portal on the Trans Mountain website. A digital version of the feedback form was available on the website between October 19, 2012, and January 14, 2013. Translated versions were available for download from the Project website in French, Chinese, and Punjabi.

As a complement to the open houses, Trans Mountain launched a digital engagement program on the Trans Mountain website. Regional forums, complete with the same information presented at the open houses, allowed stakeholders not in attendance to review the information and provide feedback. The forums were hosted for a month and the end date for each was clearly identified.

To maximize the reach of notification and ensure directly affected stakeholders in densely populated areas were informed, Trans Mountain performed a direct mail drop from Hope to Burnaby, BC. Residences within 200 m of either side of the right-of-way plus a wide area around the Burnaby Tank Facility received a postcard asking them to provide their feedback about the Project in the online feedback forum. More than 170,000 postcards were distributed by mail.

After each public open house, the Project team placed thank-you advertisements in local newspapers and followed up by mail or email with all attendees who provided contact

information, thanking them for participating and encouraging them to complete the feedback form.

A Phase 2 Engagement Summary Report, released publicly on March 7, 2013; summarized the feedback received during the public open houses as well as upcoming opportunities for engagement on the Project. On March 14, 2013, Trans Mountain issued an E-blast regarding the summary report to stakeholders and members of the public who have subscribed to the Trans Mountain website and various participant lists.

2.2.6.2.2 Meetings with Government Representatives

From October 2012 to January 2013, the following engagement activities were held with government representatives:

- 45 meetings with municipal governments representatives;
- 25 meetings with federal government representatives;
- 34 meetings with provincial government representatives; and
- 165 meetings with other organizations including local interest groups, chambers of commerce, and ENGOs.

2.2.6.2.3 Media Relations

Trans Mountain contacted 110 reporters and members of the news media by phone or email during the Phase 2 engagement period. The Project team provided 85 interviews with newspapers, magazines, radio stations, and TV broadcasters. In addition, two full media briefings were held, one in Vancouver, BC, and the other in Victoria, BC.

2.2.6.2.4 Project Updates

Project updates were released on October 25, 2012 and January 10, 2013, and were made available on the 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.

2.2.6.2.5 Email and Toll-Free Inquiries

In Phase 2, 228 emails were received by the Trans Mountain email address and 64 phone calls were received by the toll-free Project line.

2.2.6.3 Phase 3 Engagement: Community Conversations (February to July 2013)

Phase 3 continued stakeholder discussions through a series of ESA workshops, community workshops, and routing open houses.

2.2.6.3.1 Environmental and Socio-Economic Assessment Workshops

Given that the Project traverses distinct geographic regions that include diverse ecosystems ranging from grasslands to rainforest and marine, Trans Mountain held regional ESA workshops to gather information related to environmental assessment. The workshops targeted municipal, federal and provincial governments, local ENGOs, and other environmental interest groups. Participants were invited based on their specific technical and/or local knowledge. Workshops

were held in Edmonton, AB, and Kamloops, Surrey, North Vancouver, Langford, and Abbotsford, BC.

All workshop materials were made available on-line to support each regional session. Access to these portals was provided to session attendees and invitees who were unable to attend the workshop sessions in person.

Feedback received at these sessions, and afterwards, was shared with the relevant environmental disciplines and was considered in setting the scope and methodologies for the Project's ESA.

2.2.6.3.2 Community Workshops

Sixteen community workshops provided an opportunity for local stakeholders to receive updated information and provide feedback on issues and concerns relative to their community specifically as it related to routing and environmental studies. Attendees included municipal representatives, local community representatives, business groups, recreational representatives, and guides and outfitters that had knowledge of community interests, the environment, economic activity, recreation, and land use. Workshops were held in the following communities:

- Edson, AB
- Hinton, AB
- Edmonton, AB
- Parkland County, AB
- Valemount, BC
- Blue River, BC
- Clearwater, BC
- Kamloops, BC
- Hope, BC
- Merritt, BC
- Chilliwack, BC
- Abbotsford, BC
- Langley, BC
- Surrey, BC
- Coquitlam, BC
- Burnaby, BC

Information presented in the community workshops was made available online the day following each session and was live for three weeks. Community residents, not in attendance at the workshops, were able to view maps, watch videos, and read about proposed study corridor selections for their area. They also had the opportunity to provide feedback through discussion forums, surveys, and question and answer (Q&A). Generally the community comment sections were open for a three week review period after the community workshop. In some locations, the community pages were open longer to accommodate the timing of another workshop in an adjacent region.

To drive awareness of online engagement opportunities, notification advertising was run in local community newspapers, online, and on some local radio stations. The advertising directed the audience online where they had the opportunity to view maps, watch videos, read about study corridor selections, and provide their feedback through discussion forums, surveys, and Q&A. The advertisements ran in each community during the three weeks that the community online page was open for comment.

2.2.6.3.3 Routing Open Houses

Trans Mountain hosted Routing Open Houses to review area-specific routing changes with affected communities and to share updated Project information with stakeholders. These routing changes were in areas where the proposed pipeline corridor would likely deviate from the excising TMPL right-of-way. Routing Open Houses were held in Edmonton, Hinton, Kamloops, Abbotsford and Burnaby.

Like previous TMEP open houses, display boards and technical representatives were available. In addition, at the Abbotsford open house, Trans Mountain provided a bus tour of the Sumas Pump Station and Terminal. The bus tour provided participants with visual of the Trans Mountain facilities.

Notification was conducted for each of the open houses through paid newspaper advertising, Twitter mentions, and media relations. In addition, direct mail drops were made in Kamloops, Burnaby and Abbotsford.

2.2.6.3.4 Terminal Open Houses

Trans Mountain held Terminals Information Sessions in Edmonton, AB and Burnaby, BC, to inform stakeholders of the proposed plans for terminal expansions and to share the proposed footprint, technical specifications, safety considerations, and to seek stakeholder feedback.

2.2.6.4 Phase 4 Engagement: Feedback to Stakeholders and Application Filing (August to December 2013)

Phase 4 included community and economic benefit presentations in conjunction with chambers of commerce, attending events, one-on-one meetings, emergency response workshops, and presentations/speaking opportunities. In addition, meetings with local government and interested parties will be ongoing. Trans Mountain will continue digital engagement efforts and seek out more public opportunities to share information and gather feedback.

Engagement initiatives in Phase 4 will be documented and provided as updates to the NEB during the proceeding.

2.2.6.5 Phase 5 Engagement: Ongoing Engagement during Regulatory Process through to In Service (January 2014 – In Service)

Additional engagement and communications phases will be developed to support the regulatory process and, if successful, the construction phases of the Project. Engagement in this phase will include sharing results of any new studies or work being completed on the Project, to communicate any changes and or updates to Project plans, to share information with stakeholders on the regulatory process, and to engage on construction effects and mitigation measures. Additional objectives include community readiness discussions that focus on communicating the benefits of the Project to local stakeholders and engaging on environment offsets.

Engagement and communications activities will be undertaken through a number of initiatives, including but not limited to, open houses, workshops, one-on-one meetings, presentations, website, online discussion forums, printed materials, and digital media including social media.

2.2.6.6 Phase 6 Engagement: Ongoing Operational Consultation, Post Construction Throughout Operational Life

Trans Mountain believes its neighbours, governments and Aboriginal communities play an important role in how Trans Mountain conducts its business. Trans Mountain's, and KMC's, success depends on earning the trust, respect, and cooperation of all community members.

Trans Mountain is committed to respectful, transparent and collaborative interactions with communities to develop long term effective relationships. Once the pipeline becomes operational, engagement opportunities will continue through hosting open houses, providing

newsletters and Project updates, making safety and public awareness presentations, participating in community events, regulatory processes, and ongoing informal meetings with stakeholders.

2.2.7 Summary of Outcomes

The Project team has received feedback through open houses, workshops, one-on-one meetings, public presentations, online discussion forums and comment forms, and directly through email and telephone contact. The full detail of stakeholder feedback collected, which has helped shape aspects of the Project, is found in Volume 3A. Figure 2.2.1 highlights the top areas of interest or concern raised between Strathcona County, AB, and Burnaby, BC:

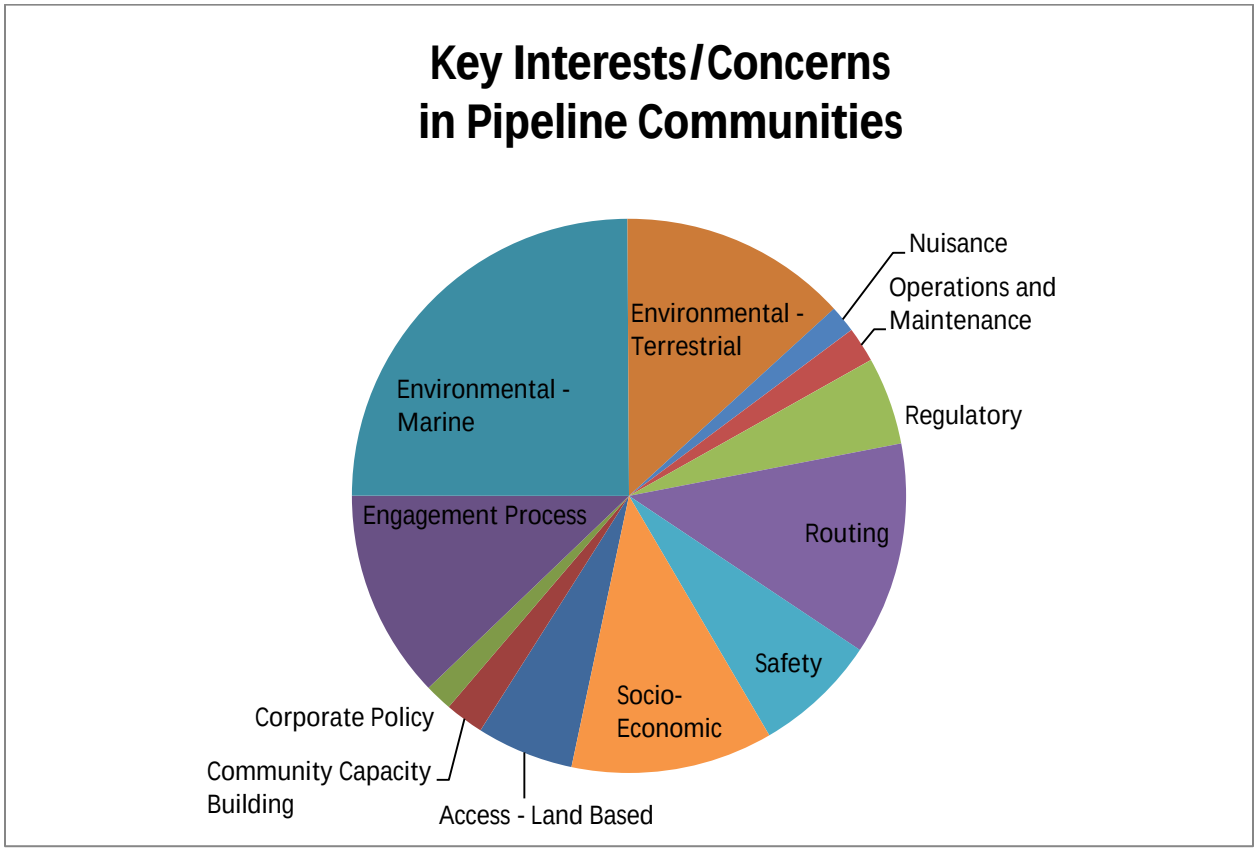


Figure 2.2.1 Key Interests/Concerns in Pipeline Communities

2.3 Aboriginal Engagement (Volume 3B)

The TMEP Aboriginal Engagement Program has been exclusively designed for engagement with Aboriginal communities and Aboriginal groups in regard to the Project. Starting in April 2012, Trans Mountain engaged with over 100 Aboriginal communities and Aboriginal groups to provide comprehensive information to them and seek feedback from them on the Project and to identify anticipated impacts of the Project on the assertion of Aboriginal rights and title governing traditional and cultural use of the land and marine environment.

For the purpose of this application, unless otherwise stated, the feedback reported in Volume 3B includes engagement activities conducted from May 2012 through to 30 September,

2013. Updates to engagement initiatives that continue to occur, and which will continue through the regulatory process, will be provided periodically to the NEB throughout the proceeding.

Trans Mountain respects the Aboriginal and treaty rights, unique culture, diversity, languages, and traditions of Aboriginal peoples. Trans Mountain acknowledges the importance of teaching, the significance of culture and language, and the considerable traditional knowledge that has been passed on for generations.

The purpose of the Aboriginal Engagement Program is to provide an open, transparent and inclusive process, which seeks to exchange information in a respectful manner to address concerns shared by those who might have an interest in the Project or have Aboriginal interests potentially affected by the Project, to incorporate feedback into Project planning and execution; and to provide opportunities to maximize Project benefits to Aboriginal communities and Aboriginal people.

2.3.1 Vision

The vision for the Aboriginal Engagement Program is to work with Aboriginal communities and Aboriginal groups in the spirit of cooperation and shared responsibility, and to build and sustain effective relationships based on mutual respect and trust to achieve respective business and community objectives.

The Trans Mountain Aboriginal Engagement Program is guided by the KMC Aboriginal Relations Policy, located in Appendix B of Volume 3B.

2.3.2 Principles

The Aboriginal Engagement Program is also guided by the following principles:

- **Build trust and respect** – these values form the basis of Trans Mountain's engagement with Aboriginal peoples.
- **Ensure meaningful engagement** – conduct meaningful engagement with Aboriginal peoples who assert Aboriginal and treaty rights.
- **Address legal requirements** – carry out Trans Mountain's legal requirements as a regulated company under the NEB jurisdiction to engage with and mitigate, where necessary, there are any Project impacts on the assertion of Aboriginal rights and title governing traditional and cultural use of the land and marine environment.
- **Provide capacity funding** – provide funding, as appropriate, to Aboriginal communities and Aboriginal groups who have an interest in the Project and who wish to engage in the Aboriginal Engagement Program.
- **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** – in partnership with Aboriginal communities and Aboriginal groups, potential impacts will be identified and assessed, and mitigation measures will be implemented where necessary.

- **Reach understandings** – reach understandings or agreements that address potential infringement of Aboriginal rights affected by the project.

- **Provide benefits** – provide procurement, employment, and workforce development opportunities to Aboriginal communities and Aboriginal groups affected by the Project, and consider Mutual Benefit Agreements (MBAs).

2.3.3 Design of Aboriginal Engagement Program

Using an inclusive approach beginning in 2011, Trans Mountain worked in collaboration with the federal government and provincial ministries to identify Aboriginal communities and Aboriginal groups in Alberta and BC that might have an interest in the Project or have Aboriginal interests potentially affected by the Project. The final list was a compilation that was further guided by the NEB, the BC Oil and Gas Commission and the Major Project's Management Office; as well as an existing list of Aboriginal communities and Aboriginal groups held by KMC, where existing relationships were in place as a result of the operating Trans Mountain Pipeline system. The result was a comprehensive list of 103 Aboriginal communities with traditional territories located within 10 km of the corridor in BC and 100 km in Alberta. In addition to the list of 103 communities, two non-land based BC Métis groups were included in the engagement list: the BC Métis Federation and the Métis Nation of BC. Section 1.3.3 of Volume 3B provides the list of all communities and groups engaged at the time of filing.

2.3.3.1 Geographic Location of Aboriginal Communities

In Alberta and BC there are substantial areas of shared territory with the 103 communities engaged. Trans Mountain has organized its Aboriginal Engagement Program into the following five regions, based on the location of Aboriginal communities along the pipeline corridor:

- Edmonton, AB to the Alberta/BC border;

- the Alberta/BC border to Kamloops, BC;

- Kamloops, BC to Hope, BC;

- Hope, BC to the Burnaby Terminal-Burrard Inlet, BC; and

- the marine transportation corridor from the Burrard Inlet to international waters.

Five regional maps that illustrate the location of the 103 communities in proximity to the pipeline corridor are included in Appendix C of Volume 3B.

2.3.3.2 Engagement Method

The Aboriginal Engagement Program uses a comprehensive process led by experienced engagement advisors in Alberta and BC. The process for engagement with Trans Mountain about the Project is flexible, allowing each community and group to engage in meaningful dialogue in the manner they choose, and in a way that meets their objectives and values.

In May 2012, the Trans Mountain Aboriginal engagement team was created and Aboriginal engagement team field advisors were assigned to each of the groups based on their knowledge and experience. Each advisor is a professional experienced in engagement. In addition to the field advisors, the Aboriginal engagement team is made up of professionals working in the areas

of Aboriginal relations, economic development, education, training, employment, and procurement.

The Aboriginal Engagement Program focuses on:

- enhancing trusting and respectful relationships;
- sharing Project information such as the Project scope, routing options, safety and emergency response, scheduling, environmental field study components;
- negotiating group and community-specific protocols, capacity agreements, Letters of Understanding (LOUs), and Mutual Benefit Agreements, as appropriate;
- facilitating traditional land use (TLU) and traditional marine resource use (TMRU) studies, including traditional ecological knowledge (TEK) and socio-economic research;
- identifying potential impacts and addressing concerns;
- discussing the adequacy of planned impact mitigation and opportunities; and
- identifying education, training, employment, and procurement opportunities.

2.3.3.3 Comprehensive Aboriginal Engagement Process

Acting as a framework for the engagement process, the following activities provide guidance to ensure a comprehensive and consistent process in working with each of the Aboriginal communities and Aboriginal groups identified by Trans Mountain:

- Project announcement;
- initial contact with Aboriginal community or Aboriginal group;
- meetings with Chief and Council, and meetings with staff;
- negotiate and execute confidential LOU/capacity agreement;
- host community information session(s);
- conduct TLU/TMRU/TEK studies;
- identify interests and concerns;
- review key mitigation options;
- provide additional capacity funding, if required; and
- negotiate and execute confidential MBA.

Trans Mountain is committed to continued listening and learning to ensure that knowledge and advice is considered and incorporated in the Project. Each community and group has the opportunity to engage with Trans Mountain in the manner they choose, depending on Project interests and potential affects.

Trans Mountain understands that it must work with Aboriginal people to identify shared goals, and our focus will be on continued consultation and collaboration with Aboriginal communities and Aboriginal groups to address concerns that have been raised.

2.3.4 Summary of Outcomes

The Aboriginal Engagement Program uses a comprehensive process led by experienced engagement advisors in Alberta and BC. The process for engagement about the Project is flexible, allowing each community and group to engage in meaningful dialogue in the manner they choose, and in a way that meets their objectives and values. Engagement methods include Project letters, meetings, phone conversations, email dialogue and public open houses. Additionally, Project information is shared through Project newsletters and the Project website. At the time of filing this application, Trans Mountain had more than 8,000 points of engagement with Aboriginal communities and Aboriginal groups relating to the Project. Additionally, Trans Mountain has executed 46 agreements including Letters/Memorandums of Understanding, capacity funding, and integrated cultural assessments with an aggregate total dollar commitment to date for capacity funding in excess of $6 million. A total of 37 communities have participated in TLU studies, 9 communities in Traditional Marine Use studies, and 28 communities in Traditional Ecological Knowledge studies.

Trans Mountain, collectively with Aboriginal communities and others, is seeking to provide procurement, employment, and workforce development opportunities, and consider MBAs. A funding program has been established to contribute to education and training initiatives that focus on pipeline construction and related skills that are transferable and allow for employment in many work environments. Through the Aboriginal Procurement Policy, Trans Mountain is actively working to connect with Aboriginal businesses offering services or products relevant to Project construction or operation. Where new investment in oil spill preparedness and response capacity is required, Trans Mountain will seek to maximize the benefit to Aboriginal communities along the pipeline and marine corridor.

The information provided in this application is intended to provide the NEB with a thorough understanding of the Trans Mountain Aboriginal Engagement Program. This submission, especially the summaries of engagement with Aboriginal communities and Aboriginal group provide a comprehensive overview of the consultation that has been undertaken to date. Trans Mountain understands that consultation is a process and not an event, and will be continuing its efforts to build positive long term relationships with the Aboriginal communities and Aboriginal groups that might have an interest in the Project or have Aboriginal interests potentially affected by the Project.

2.4 Landowner Relations (Volume 3C)

Trans Mountain has engaged in a Landowner Relations Program to introduce and discuss the Project to landowners and occupants along the proposed pipeline corridor. Volume 3C describes the program and provides a summary of the issues and concerns raised by landowners.

The primary objectives of the Landowner Relations Program were to introduce the Project to landowners and occupants and obtain approval for land access on a timely basis to support engineering surveys and environmental studies.

Stakeholder groups in the Landowner Relations Program include private landowners, freehold and Crown occupants, and public landowners (federal, provincial, and municipal).

Through the course of the Landowner Relations Program, a number of information letters serving various purposes were distributed to Landowners and Crown Occupants.

In April 2012, an initial contact letter was sent to 2,390 landowners along the TMPL with information regarding the Project and links to further information on the Project and NEB websites.

Residents along the TMPL right-of-way in Edmonton and the BC Lower Mainland raised concern of potentially expanding the pipeline corridor through residential areas. A communication was issued to those urban residents that Trans Mountain intended to pursue alternative routing in their communities.

In October 2013, further communication began to those landowners along TMPL where deviation from TMPL was likely. The landowners have been advised that entry onto their property is not required at this time because an alternative route is preferred and will be studied. These communications are ongoing.

A mail-out was distributed in July 2013 to select Crown tenure holders that may be impacted by the Project. The purpose of the mail-out was to provide project information and encourage feedback for consideration of socio-economic impacts and assessment of human occupancy and resource use. The mail out was directed at the following tenure holder categories: agricultural tenure holders, commercial recreation tenure holders and guide-outfitters; and registered trap line tenure holders.

In the summer of 2012, a process commenced to contact all landowners and certain categories of Crown Occupants within the study corridor to provide general Project information, specific information about routing and seek consent for access to the lands for engineering and environmental investigations. This provided a further opportunity for landowners and occupants to directly convey their comments, concerns and issues.

Along the study corridor, 1,325 landowners and 295 Crown rights holders in Alberta were contacted. In BC, 4,013 landowners and 615 Crown rights holders and pending land purchasers were also contacted.

Based on feedback received, landowner issues generally include: land rights, compensation, land-specific construction and restoration activities, as well as broader Project and policy issues.

Landowners of approximately 85 per cent of all tracts of land raised no comments or concerns at this phase of the program. Of those that did comment within Alberta, the primary concerns are about environmental and land-related effects. In BC, the primary concerns relate to environmental and compensation/financial issues.

Trans Mountain will continue to respond to concerns and issues of each Landowner or Occupant.

2.5 Project Design and Execution – Engineering, Construction, and Operations and Maintenance (Volumes 4A, 4B, and 4C)

Volumes 4A, 4B and 4C of the application provide technical details about the proposed changes to the TMPL system between Edmonton, Alberta and Burnaby, BC to create two parallel pipeline systems and to add two more pipelines between Burnaby and the Westridge Marine

Terminal. Among many other elements, it explains the process for determining the proposed and final alignments of the new pipeline segments.

2.5.1 Design

The existing 1,147-km pipeline system has an average annual capacity of approximately 300,000 bbl/d. The expanded TMPL system will include two independently operated pipelines from Edmonton Terminal to Burnaby Terminal that will have a combined average annual capacity of 890,000 bbl/d.

Several existing active pipeline segments and two existing inactive pipeline segments (which will be reactivated) will be combined to create Line 1, which will have an average annual capacity of 350,000 bbl/d and will continue to provide transportation for light crude oils and refined products. Line 1 will also be capable of transporting heavy crude oils at a reduced capacity. The new pipeline segments and two existing active pipeline segments will be combined to create a second pipeline, Line 2, which will have an average annual capacity of 540,000 bbl/d and will provide transportation for heavy crude oils. Line 2 will also be capable of transporting light crude oils at the same rate.

The pipeline scope includes 994 km of new, buried pipeline segments in Alberta and BC, including two new parallel 3.6 km segments between Burnaby and Westridge, as well as the reactivation of 193 km of existing inactive pipeline segments. The scope also includes new and modified facilities such as pump stations and terminals, including three new berths at the Westridge Marine Terminal each capable of handling Aframax class vessels.

The expanded Westridge Marine Terminal has been designed to be capable of serving 34 Aframax class vessels per month, with actual demand to be driven by market conditions. The maximum size of vessels (Aframax class) served at the terminal will not change as part of the Project. Similarly, the future cargo will continue to be crude oil, primarily diluted bitumen. Of the 141,500 m^3/d (890,000 bbl/d) capacity of the expanded system, up to 100,200 m^3/d (630,000 bbl/d) may be delivered to the Westridge Marine Terminal for shipment.

The pipelines and facilities will be designed in accordance with the requirements of the NEB *On-Shore Pipeline Regulations* (OPR), Canadian Standards Association (CSA) Z662 Oil and Gas Pipeline Systems, and the applicable standards referenced therein. The new Line 2 pipeline segments and the new facilities, including the tanks and the dock complex, will be designed to withstand a one-in-2,475-year seismic event, consistent with current requirements of the National Building Code of Canada.

2.5.2 Construction

Pending the receipt of regulatory approval, the construction of the TMEP pipeline segments is scheduled for an approximately 24-month period between the fourth quarter of 2015 and the fourth quarter of 2017. Preliminary plans provide for the pipeline to be constructed using seven concurrent construction spreads during consecutive construction seasons: summer 2016; winter 2016/2017; and summer 2017. In this context the summer seasons will extend from May to October and the winter season will extend from November to April. Early work activities such as clearing and access road construction will begin as soon as possible after the receipt of the CPCN.

The pump stations are anticipated to be constructed over a 14 month period from March 2016 to April 2017.

Work at Edmonton Terminal is expected to take about 18 months from May 2016 through October 2017. Work at Sumas Terminal is expected to take about 14 months from July 2016 through August 2017. Work at Burnaby Terminal is expected to take about 23 months from January 2016 through November 2017. Work at Westridge Marine Terminal is expected to take about 26 months from November 2015 through December 2017.

Local existing commercial accommodations will house the workforces to the extent practical for the construction of the pipeline, pump stations, and terminals. Temporary construction camps will be deployed to house workers where local accommodation will not meet the need.

2.5.3 Operations and Maintenance

The expanded TMPL system will be operated and maintained by KMC in accordance with the KMC ISLMS.

The elements of the ISLMS that are of particular relevance and interest to the Project include:

- operation philosophy and procedures;
- systems integrity management;
- leak detection; and
- emergency management.

Most of the elements of the expanded TMPL system will be operated from the existing Primary Control Centre located in Sherwood Park, AB. The pipeline will be monitored and controlled by KMC CCOs 24 hours per day, seven days per week. Field operations will be performed by personnel located along the TMPL system at existing operations bases. KMC CCOs and field operating personnel are qualified using a comprehensive, procedure-based training program. The existing preventative maintenance system and procedures will be applied to the expanded TMPL facilities.

Systems integrity management involves structured risk identification and assessment. Various tools and techniques are currently in use and will be used to generate, assess and evaluate operational risks within the expanded TMPL system. The integrity risk assessment results are and will be used to prioritize maintenance activities and ILI programs. These activities and programs are and will be formalized in the Integrity Management Program (IMP) for pipelines and the Facilities Integrity Management Program (FIMP).

As is the case for the existing TMPL system, ongoing surveillance and inspection of the expanded TMPL system pipelines will include aerial and ground patrols, investigation and removal of unauthorized encroachments, monitoring of natural hazards, including potentially unstable slopes and water crossings, vegetation control, monitoring of the cathodic protection (anti-corrosion) system, pipeline ILI surveys, using a variety of sophisticated ILI tools and mainline block valve inspection and function testing.

Scheduled runs of ILI tools will be undertaken to assess the integrity of the expanded TMPL system pipelines in accordance with the KMC IMP. ILI tools (sometimes known as smart pigs), are highly sophisticated instruments sent through pipelines, usually while they are in operation. ILI tools include sensors and electronics that collect and store various forms of data during their inspection runs. The data is subsequently analyzed by the ILI service provider and KMC integrity engineers using sophisticated algorithms. The results are used to prioritize anomalies

for further investigation. Anomalies that fail to meet the requirements to remain unmitigated, thereby posing a threat to the integrity of the pipeline, will be considered defects and repaired in accordance with applicable legislative requirements and KMC protocols, standards and procedures.

The expanded TMPL system, like the existing TMPL system, will include the implementation of the state-of-the-art, real-time, transient, computational pipeline leak detection system, that is currently in service on the existing TMPL system. KMC has a long and successful history with the implementation of these types of leak detection systems, which are widely viewed as the most effective type of system for liquid petroleum transmission pipelines.

As is the case on the existing TMPL system, facilities on the expanded TMPL system will have ESD systems, which will initiate automatically in the case of certain abnormal conditions. For example, at pump stations, an automated ESD may be initiated by combustible gas or fire detectors, sump tank high level switches, hydrocarbon detectors, or pressure transmitters. Initiation of an ESD at a pump station will result in the immediate and automatic stopping of all running pump units, the closing of the station suction and discharge valves. Similar ESD systems will exist at the terminals.

In addition to the automated ESD systems, the CCOs will be able to use the expanded TMPL SCADA system to shut down mainline pumps and booster pumps, close pump station and terminals valves and close RMLBVs. When an alarm is received from the leak detection system, a pump station, a terminal, or an ancillary facility, the CCO will take whatever immediate action is required by the Control Centre Procedures, including issuing step by step shut-down and isolation commands using the SCADA system and dispatching field staff to investigate and initiate further emergency response measures, as appropriate.

KMC has a mature Emergency Management Program, which is based on a combination of legislative compliance, operational need, industry best practice, and lessons learned through regular exercises and actual incidents. The Emergency Management Program is embedded within the management system framework provided by the ISLMS and the Environment, Health and Safety Management System.

KMC was an early adopter of the Incident Command System (ICS) for emergency response, with introduction of the system in the early 1990s. The ICS is designed to enable effective, efficient incident management through integration of facilities, equipment, personnel, procedures, and communications within a common organizational structure. The ICS provides a standard format, with the purpose of enabling incident managers to identify the key concerns associated with the incident, often under urgent conditions, without sacrificing attention to any component of the response. It represents organizational best practices and, as an element of the Command and Management Component of National Interagency Incident Management System, has become the world-wide standard for emergency management.

Emergency Response Plans (ERPs) have been developed for the existing TMPL system and will be enhanced and implemented on the expanded TMPL system. These plans detail prescriptive procedures, activities, and checklists to ensure consistent response to incidents with the common objective of protecting company personnel and contractors, the public and public property, and the environment.

There are seven Oil Spill Containment and Recovery (OSCAR) response units placed strategically along the existing TMPL route, at a spacing of approximately two to three hours of road driving distance. All units are equipped to a standard level, which includes a minimum of

229 m of containment boom, skimmers, sorbents, pumps, temporary storage, tools, and personal protective gear. Some units have additional specialized equipment to meet the specific needs of the local area. KMC is also a shareholder and sits on the Board of Directors of Western Canada Marine Response Corporation (WCMRC) which has significant resources to respond to marine spills.

KMC has a rigorous training and response exercise program that ranges from detailed equipment deployment drills to full ICS management and organization training and deployment. Training is provided to operations and head office staff, and at locations along the TMPL system. Local response organizations and government agencies are invited to participate in both table-top exercises and field deployments.

KMC recognizes that the Project coincides with a heightened public awareness of the hazards associated with transportation of petroleum products. Although the existing Emergency Management Program is comprehensive and meets current needs, it will be fully reviewed and enhanced as required to address the needs of the expanded TMPL system.

2.6 ESA – Biophysical and Socio-Economic, including Technical Reports (Volumes 5A, 5B, 5C, and 5D)

A detailed summary of the ESA is provided in Section 3.0 of this volume. The ESA for the pipeline and facilities components of the Project concludes that the Project will not have a significant adverse effect on any biophysical or socio-economic element, provided the proposed mitigation measures are implemented. Some potential residual socio-economic effects are positive, particularly where related to increased business, employment opportunities and economic benefits. The ESA concludes that the Project will have two significant positive effects related to provincial and national benefits and increased municipal taxes in local communities. The ESA for the marine transportation component of the Project concludes that the Project will not have a significant adverse effect on any biophysical or socio-economic element except the potential effect of sensory disturbance on southern resident killer whales and the related effect on TMRU by Aboriginal communities. With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. Even though the Project contribution to overall sensory disturbance effects would be small, the potential effect of the increase in Project-related marine vessel traffic was determined to be high magnitude, high probability and significant for southern resident killer whales.

2.7 Environmental Compliance (Volumes 6A, 6B, 6C, 6D, and 6E)

The five related volumes in Volume 6 include:

- Environmental Compliance (Volume 6A);
- Environmental Protection Plans (one each for the TMPL, the pump stations and storage facilities, and the Westridge Marine Terminal) (Volumes 6B, 6C, and 6D); and
- Environmental Alignment Sheets (Volume 6E).

Environmental Compliance (Volume 6A) describes the KMC (as the operator of the TMPL system) compliance strategy, environmental education program, inspection and post-construction monitoring programs.

The EPPs are the tools used to document and communicate mitigation measures, management plans and contingency plans describes in the ESA so they can be effectively implemented during construction and operation of the Project.

The Environmental alignment sheets are the photomosaic maps of the proposed pipeline corridor that identify environmental features and locations where select site-specific mitigation measures are to be implemented.

2.8 Risk Assessment and Management of Pipeline and Facility Spills (Volume 7)

Volume 7 provides a comprehensive overview of the measures to prevent oil spills, risks related to oil spills, emergency response in the event of a spill, fate and behaviour of spills in both fresh and brackish water, and the ecological and human health risks associated with a spill. Volume 7 also provides an assessment of KMC's financial capacity to respond to a spill.

Volume 7 and the systems and processes described therein are specific to the risks associated with the proposed pipeline and expanded Westridge Terminal operations. Volume 7 includes all information required by the NEB Filing Manual (NEB 2013c), NEB OPR (NEB 1999) and CSA Z662-11 - Oil and Gas Pipeline Systems (CSA 2011).

KMC, as the operator of the TMPL system, considers the prevention of spills to be the primary goal and will employ the necessary management systems and resources to ensure that this goal is achieved on the TMEP. The measures available to prevent and mitigate spills from new pipelines and facilities will be appropriate to the nature of the threat and the associated consequences of a spill. Many of the prevention and mitigation measures considered for the Project have been identified in other parts of the application: engineering designs that eliminate or minimize integrity threats are detailed (Volume 4A); construction and quality assurance practices that will ensure the integrity of the pipeline and facilities through to commissioning (Volume 4B); and ongoing integrity management programs that will be applied once the pipeline and facilities are operational (Volume 4C).

Spill prevention and mitigation measures are embedded throughout the full Project lifecycle and start with risk assessment of preliminary engineering designs for the Project. Formalized risk assessments are conducted as part of the design process as documented in Volume 7, Section 3.0, which allows for early identification of all applicable hazards and suitable control measures included in and supplemental to the CSA Z662 Oil and Gas pipelines code.

The KMC IMPs for pipelines and FIMP for facilities will confirm the ongoing operational reliability of all system components including the pipeline, pump stations, valve and launcher/receiver assemblies, tank terminals, and the expanded marine terminal. The IMPs for both pipelines and facilities will contribute to ensuring compliance with applicable regulatory requirements.

In order to understand the potential environmental and socio-economic effects resulting from an oil spill, Trans Mountain completed an assessment of five hypothetical representative spill scenarios, four related to locations along the proposed expanded TMPL system and one at the expanded Westridge Marine Terminal. The assessment included a review of historical oil spills to understand the potential environmental and socio-economic effects resulting from those cases.

The four representative spill scenarios along the TMPL system assume a credible worst case volume as well as a smaller volume of oil released and that the accidental release of oil would

reach a water body. Similarly, the hypothetical scenario at the Westridge Marine Terminal assumes oil would enter the Burrard Inlet. Each of the scenarios are assessed for variable environmental conditions with the assessment of spills under conditions that represent the four seasons of the year. The representative spill scenarios are based on a release of Cold Lake Winter Blend diluted bitumen, with fate and behavior considerations for weathering and assessed impacts to land and water. For the purposes of understanding the extent of potential environmental and socio-economic effects resulting from a hypothetical spill, the scenarios were modelled assuming that no emergency response measures would be undertaken, where in reality, KMC would initiate emergency response measures immediately to mitigate the spread of oil and resulting effects.

Kinder Morgan Canada has a mature Emergency Management Program which is based on a combination of regulatory compliance, operational need, industry best practice, and lessons learned through regular exercises and actual incidents. The Program is embedded within the management system framework provided by the Integrated Loss Management System and the Environment, Health and Safety Management System. The Emergency Management Program is effectively managed through an ICS and ERPs, response equipment, and regular desktop training and field deployment exercises, which all contribute to a highly trained response staff and response readiness within the organization.

Trans Mountain currently has $750 million of spill liability insurance, the first $2 million which is covered by self insurance. Trans Mountain intends to maintain this level of spill liability insurance throughout the life of the TMPL asset. Combined, between the $750 million of spill liability insurance and $3.2 billion of equity upon TMEP completion, TMPL will have sufficient financial capacity to meet either the estimated hypothetical worst case spill scenario ($300 million, as estimated by HJ Ruitenbeek Resource Consulting) or the $1 billion financial capacity that is anticipated to be legislated by the federal government.

KMC recognizes that the Project coincides with a heightened public awareness of the hazards associated with transportation of petroleum products. Sixty years of operation of the Trans Mountain pipeline system provides a comprehensive understanding of the risks inherent to the pipeline corridor, pipeline design factors to be considered, and mature operations and maintenance systems. The TMEP will leverage the existing knowledge and systems, will complete systematic assessments of risk, and incorporate planned mitigation and improvements to enhance system safety, including enhancements to an effective Emergency Management Program.

2.9 Marine Transportation (Volumes 8A, 8B, and 8C)

The proposed Project would result in an increase in tanker traffic transiting the Salish Sea Region as tankers enter from the Pacific Ocean approaching or leaving Westridge Marine Terminal. The Salish Sea includes Vancouver Harbour, the Strait of Georgia, Boundary Pass, Haro Strait, and the Strait of Juan de Fuca. See Figure 2.9.1.

While Trans Mountain does not own or operate the vessels calling at the Westridge Marine Terminal, it is responsible for ensuring the safety of the terminal operations. In addition to Trans Mountain's own screening process and terminal procedures, all vessels calling at Westridge must operate according to rules established by the International Maritime Organization, Transport Canada, the Pacific Pilotage Authority, and Port Metro Vancouver (PMV). Although Trans Mountain is not responsible for vessel operations, it is an active member in the maritime community and works with BC maritime agencies to promote best practices and facilitate improvements to ensure the safety and efficiency of tanker traffic in the Salish Sea. Trans

Mountain is a member of the WCMRC, and works closely with WCMRC and other members to ensure that WCMRC remains capable of responding to spills from vessels loading or unloading product or transporting it within their area of jurisdiction.

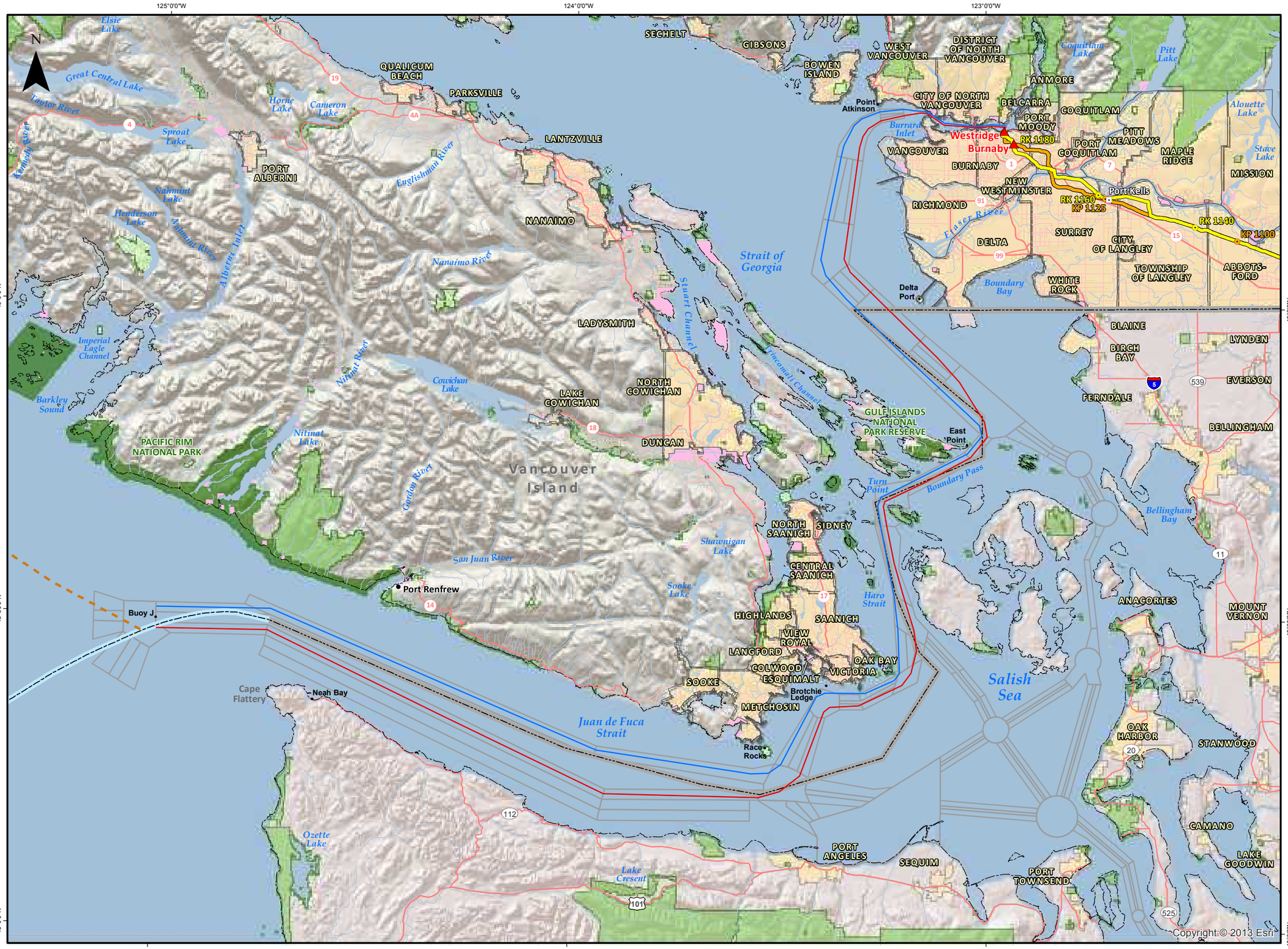
Currently, in a typical month, five vessels are loaded with heavy crude oil at the Westridge Marine Terminal. The expanded system will be capable of serving 34 Aframax class vessels per month, with actual demand to be influenced by market conditions. Similarly, the future cargo will continue to be crude oil, primarily diluted bitumen.

Trans Mountain recognizes that this increase in traffic volume results in an increase in the probability of an accidental oil spill from a laden tanker leaving the Westridge Marine Terminal. In addition, Trans Mountain acknowledges that the Project-related increase in tanker traffic may also result in potentially adverse environmental and socio-economic effects.

The ESA concludes that past and currently ongoing activities and the designation as a *Species at Risk Act* (SARA) listed species indicate there has been a significant adverse effect on the endangered southern resident killer whale population that uses the shipping lanes. Underwater noise modelling completed for the Project demonstrated that additional Project-related marine shipping transits will increase underwater noise and potential sensory disturbance of this population. While the Project's contribution to overall sensory disturbance effects is small, the potential effect of the increase in Project-related marine vessel traffic is considered to be high magnitude, high probability and significant for southern resident killer whales.

With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. PMV is developing a collaborative multi-stakeholder program to look at the current levels of underwater noise in the Strait of Georgia and surrounding waters and to consider options for reducing potential cumulative environmental effects of noise from marine vessel traffic on marine mammals. Trans Mountain is strongly supportive of this regionally-focused collaborative approach to managing cumulative effects of the marine transportation industry as a whole and will continue discussions with PMV to establish how to best participate in current and future initiatives on this topic aimed at reducing the existing effects on southern resident killer whales.

These potential environmental and socio-economic effects are summarized in Section 3.2.6 of this volume.



TRANS MOUNTAIN

FIGURE 2.9.1

REGIONAL LOCATION OF MARINE SHIPPING LANES

TRANS MOUNTAIN EXPANSION PROJECT

- Reference Kilometre Post (RK)
- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Terminal
- Existing Pump Station
- Highway
- Road
- 12 Nautical Mile Limit (Territorial Sea)
- Limit of Exclusive Economic Zone (EEZ)
- International Boundary
- Marine Vessel Outbound Shipping Lane
- Marine Vessel Inbound Shipping Lane
- Traffic Separation Scheme
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial / State Park
- Protected Area/Natural Area/ Provincial Recreation Area/Wilderness Provincial Park/Conservancy Area

Projection: UTM Zone 10N.
Routing:Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Facilities: provided by KMC, 2012; Transportation: BC Forests, Lands and Natural Resource Operations, 2012 & ESRI, 2005; Geopolitical Boundaries: IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005, Natural Resources Canada, 2012; First Nation Lands: Government of Canada, 2013 & IHS Inc., 2011; Hydrology: IHS Inc., 2004, United States National Imagery and Mapping Agency, 2000, Natural Resouces Canada, 2010; Parks and Protected Areas: Natural Resources Canada, 2013, BC FLNRO, 2008; CHS: provided by KMC, 2013; Marine Shipping Lanes: Moffatt and Nichol, 2013; Hillshade: TERA, derived from Geobase; US Hillshade: ESRI, 2009.

tera ENVIRONMENTAL CONSULTANTS

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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ALL LOCATIONS APPROXIMATE

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3.0 SUMMARY OF ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT

The purpose of the ESA is to provide the NEB, other regulatory authorities, Aboriginal communities and interested members of the public with an independent account of:

- the way that the Project could affect people and the environment, including concerns raised about the Project;
- the measures that will be taken by the Project to address concerns and avoid or reduce anticipated adverse effects over the life of the Project (referred to as mitigation measures);
- recommendations to others to implement mitigation measures that are beyond the direct control of the Project;
- any areas recommended for post-construction environmental monitoring (PCEM) as well as areas of uncertainty requiring further study (referred to as follow-up programs); and
- conclusions regarding the 'significance' of anticipated effects after mitigation measures are applied (termed residual effects).

By necessity, the Project ESA is detailed and lengthy, because it must discuss and assess the potential implications of a wide variety of Project activities in diverse environmental and human settings including the developed Edmonton region, west-central Alberta, the Rocky Mountains, North Thompson River valley, BC southern interior, Coquihalla corridor through the coast range and the Lower Mainland Developed Area west of Hope to Burnaby, as well as the established shipping lanes from Westridge Marine Terminal in Burrard Inlet to the edge of Canada's territorial waters in the Juan de Fuca Strait to the 12 mile nautical limit. Given this complexity, the ESA is divided into a number of volumes. While these volumes differ in content, they were prepared with a consistent approach (see 3.1.3).

This section provides an overview of key issues and findings presented in the following ESA volumes and supporting technical reports. This section also presents conclusions about overall Project effects and the significance of those effects, taking anticipated Project activities into account. Interested readers are invited to refer to one or more of the individual volumes or technical reports for more detailed discussion on topics of interest as outlined in Table 3.1

TABLE 3.1

SUMMARY OF ESA VOLUMES CONTENTS

Volume	Purpose and Content
5A: ESA - Biophysical	Describes biophysical Project components and activities, engagement and consultation for the ESA, physical and environmental setting, corridor and facility site selection, proposed mitigation, potential Project-specific and cumulative effects, and anticipated significance for pipeline, facilities and Westridge Marine Terminal. Note that terms biophysical and environmental are frequently used interchangeably here, and in the ESA.
5B: ESA - Socio-Economic	Describes socio-economic Project components and activities, engagement and consultation for the ESA, corridor and facility site selection, human setting, identified concerns, proposed mitigation, potential Project-specific and cumulative effects, and anticipated significance for pipeline, facilities and Westridge Marine Terminal.
5C: ESA - Biophysical Technical Reports	Discipline-specific background information, the methodology and results of biophysical field surveys, recommendations, and research conducted in support of the ESA.
5D: ESA - Socio-Economic Technical Reports	Discipline-specific background information, the methodology, results of field survey and recommendations of socio-economic research conducted in support of the ESA.
6A: Environmental Compliance	Describes compliance strategy, environmental education program, inspection and post-construction monitoring programs.
6B: Pipeline Environmental Protection Plan	Detailed mitigation measures, management plans and contingency plans for pipeline construction activities.
6C: Facilities Environmental Protection Plan	Detailed mitigation measures, management plans and contingency plans for facilities construction activities.
6D: Westridge Marine Terminal Environmental Protection Plan	Detailed mitigation measures, management plans and contingency plans for Westridge Marine Terminal onshore and near-shore construction activities.
6E: Environmental Alignment Sheets	Photomosaic maps of the proposed pipeline corridor that identify environmental features and locations where select site-specific mitigation measures are to be implemented.
7: Risk Assessment and Management of Pipeline and Facility Spills	Describes risk, potential environmental and socio-economic effects, and mitigation of credible worst case and smaller spills from the pipeline and Westridge Marine Terminal. Risk assessments conducted in support of the ESA are appended.
8A: Marine Transportation Assessment	Describes physical, environmental and socio-economic setting, identifies concerns, proposes mitigation (including industry best practices and relevant federal regulations), predicts potential Project and cumulative effects, and anticipated significance for increase in Project–related marine shipping as well as risk, potential environmental and socio-economic effects, and mitigation of credible worst case and smaller marine spills.
8B: Marine Transportation Technical Reports	Discipline-specific background information, the methodology and results of biophysical and socio-economic field surveys, research, and risk assessments conducted in support of the ESA.
8C: TERMPOL Reports	Studies on navigational safety and management submitted to support the independent TERMPOL Review Process chaired by Transport Canada. Studies directly relevant to the ESA include: Salish Sea vessel movement patterns; shipping quantitative risk assessment; and oil spill scenario fate and behaviour modelling.

3.1 Environmental and Socio-Economic Assessment Scope and Methods

The contents of an ESA must fulfill regulatory requirements, reflect input from Aboriginal communities, landowners, the public and regulatory authorities, and apply transparent and technically defensible methods appropriate to each discipline or element. This section summarizes applicable regulatory requirements (Section 3.1.1), input from Aboriginal communities and consultation with landowners, regulatory authorities, stakeholders, and the general public (Section 3.1.2), and technical approaches used by the independent specialists who prepared the ESA (Section 3.1.3).

3.1.1 Regulatory Requirements

The Project will require a NEB CPCN pursuant to Section 52 of the *NEB Act* as described in Section 1.0. In addition, according to the Regulations Designating Physical Activities, the Project is a designated project under the *CEA Act, 2012*. The ESA considers the mandatory factors listed in Section 19(1) of the *CEA Act, 2012* and the factors listed in the NEB Filing Manual (NEB 2013c).

The ESA specifically addresses the environmental and socio-economic issues from the NEB's List of Issues for the Project (NEB 2013a) provided below.

4. *The potential environmental and socio-economic effects of the proposed project, including any cumulative environmental effects that are likely to result from the project, including those required to be considered by the NEB's Filing Manual.*

5. *The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed project, including the potential effects of accidents or malfunctions that may occur (addressed in Volume 8A).*

6. *The appropriateness of the general route and land requirements for the proposed project.*

9. *Potential impacts of the project on Aboriginal interests.*

10. *Potential impacts of the project on landowners and land use.*

11. *Contingency planning for spills, accidents or malfunctions, during construction and operation of the project.*

12. *Safety and security during construction of the proposed project and operation of the project, including emergency response planning and third-party damage prevention.*

The Board does not intend to consider the environmental and socio-economic effects associated with upstream activities, the development of oil sands, or the downstream use of the oil transported by the pipeline.

The ESA also addresses the NEB's Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project (September 10, 2013) (NEB 2013b):

> "Guide A.2 of the *Filing Manual provides general guidance on the appropriate level of detail to be included in the application. Detailed information on the baseline setting, potential effects and cumulative effects is not required for particular biophysical or socio-economic elements or interactions if the application demonstrates that potential effects from the increase in marine shipping activities are negligible.*
>
> *The assessment of accidents and malfunctions related to the increase in marine shipping activities must include an assessment of potential accidents and malfunctions at the Terminal and at representative locations along the marine shipping routes. Selection of locations should be risk informed considering both probability and consequence. The assessment must include a description of:*
>
> - *measures to reduce the potential for accidents and malfunctions to occur, including an overview of relevant regulatory regimes;*
> - *credible worst case spill scenarios and smaller spill scenarios;*
> - *the fate and behavior of any hydrocarbons that may be spilled;*
> - *potential environmental and socio-economic effects of credible worst case spill scenarios and of smaller spill scenarios, taking into account the season-specific behavior, trajectory, and fate of hydrocarbons spilled, as well as the range of weather and marine conditions that could prevail during the spill event;*
> - *ecological and human health risk assessments for credible worst case and smaller spill scenarios, including justification of the methodologies used; and*
> - *preparedness and response planning and measures, including an overview of the relevant regulatory regimes.*
>
> *The assessment of accidents and malfunctions must also provide a description of the liability and compensation regime that would apply in the case of a spill."*

The NEB Filing Manual (available on the NEB website) provides a detailed description of the NEB's expectations for an ESA. Trans Mountain has addressed all applicable requirements, including those of Guide A.2 – ESA, developed in accordance with requirements set out in the *NEB Act*. NEB Filing Manual Guide A.2 has been a key reference for Trans Mountain in developing the ESA. Trans Mountain has also considered applicable Operational Policy Statements (OPS) and reference guidance documents issued by the Canadian Environmental Assessment Agency. In addition, other interested groups and individuals have provided ESA scoping guidance, influencing the level of detail included in the ESA as outlined in the consultation and effects assessment methodology sub-sections below.

3.1.2 Public Consultation, Aboriginal Engagement and Landowner Relations

The ESA considers pertinent issues and concerns identified through Aboriginal engagement and consultation with landowners, regulatory authorities, stakeholders, and the general public from which Trans Mountain actively sought comments and suggestions on the ESA approach

and methods. Feedback on the Project in general, and ESA issues and methods more specifically, was received from public open houses, ESA Workshops, Community Workshops, one-on-one meetings, public presentations, online discussion and comment forums. Key topics and issues were considered and incorporated into ESA volumes where applicable.

Trans Mountain hosted ESA Workshops to provide information on the proposed approach used for the Project ESA and to seek input from stakeholders regarding study approach, methodology and regions. The proposed Project traverses distinct geographic regions that include diverse ecosystems ranging from grasslands to coastal rainforest. Regional experts were invited to attend ESA Workshops in representative communities in order to capture specialist knowledge for each region. The ESA Workshops targeted local and regional subject matter experts from municipal, federal and provincial governments, local ENGOs and other environmental interest groups. Trans Mountain hosted the ESA Workshops in Edmonton, Alberta; and Kamloops, Surrey and Abbotsford, BC. Trans Mountain also hosted two Marine ESA Workshops in Langford and North Vancouver, BC. Feedback from local environmental groups was particularly important during Community Workshops and ESA Workshops where local environmental knowledge helped to identify issues of concern in study areas as well as potential mitigation measures and compensation or offset ideas to consider as part of the overall Project proposal.

Interests and concerns noted for each ESA element during consultation/engagement with Aboriginal communities, landowners, federal, provincial and municipal regulatory authorities, stakeholders and the general public, and the location where those issues are addressed in the application, are described in Section 3.0 of Volumes 5A, 5B and 8A.

3.1.3 Effects Assessment Process and Methods

The ESA was prepared by a team of qualified environmental and socio-economic professionals with element-specific expertise led by TERA (note: the NEB Filing Manual uses the term ‘element’ to describe technical disciplines or specialties). ESA team members included representatives from the organizations list in Table 3.1.1.

TABLE 3.1.1

PROJECT ESA TEAM

ESA Element or Discipline	Contributors
Geotechnical evaluation and assessment	BGC Engineering Inc. and TERA
Soil survey and assessment	Mentiga Pedology Consultants Ltd. and TERA
Groundwater assessment	Waterline Resources Inc.
Air quality and greenhouse gas emissions Noise assessment	Rowan Williams Davies and Irwin Inc.
Fish and fish habitat survey and assessment	GeoMarine Environmental Consultants Ltd. Triton Environmental Consultants Ltd. TERA
Marine resources assessment (marine fish and marine mammals) Marine birds assessment Marine sediment and water quality assessment Ecological risk assessment	Stantec Consulting Ltd.
Agricultural resources	McTavish Resource & Management Consultants

TABLE 3.1.1

PROJECT ESA TEAM (continued)

ESA Element or Discipline	Contributors
Palaeontological resources	Steppe Consulting Inc. and L.V. Hills
Forest resources	B.A. Blackwell & Associates Ltd.
Socio-economic assessment Marine commercial, recreational and tourism use assessment	Vista Strategy Corp. and TERA
Economic assessment	Conference Board of Canada
Worker expenditure analysis	Decision Economics Consulting Group
Community health assessment	Habitat Health Impact Consulting Corp.
Human health risk assessment	Intrinsik Environmental Sciences Inc.
Surface water assessment Wetland survey and assessment Vegetation survey and assessment Wildlife and wildlife habitat survey and assessment Heritage resources Traditional land and resource use TMRU Viewshed analysis	TERA

A step-wise ESA process is applied to consistently and transparently determine the significance of potential residual effects resulting from pipeline, facilities and Westridge Marine Terminal construction and operation as well as marine transportation activities after taking into consideration proposed mitigation. It evaluates the environmental effects of the construction (including reactivation/modification), operations, and decommissioning and abandonment phases of each component of the Project. ESA methods are described in Volumes 5A, 5B, 7 and 8A as well as in technical reports that support these volumes (Volumes 5C, 5D, and 8B). ESA process steps include:

- Describe the environmental and socio-economic setting to provide context for Project planning, routing and siting, mitigation, and effects assessment.
- Identify environmental and socio-economic elements that could be affected.
- Define the representative indicators and measurement endpoints to be used to assess each element.
- Determine spatial and temporal assessment boundaries for each element.
- Identify potential environmental and socio-economic effects for each indicator.
- Develop appropriate technically and economically feasible site-specific mitigation and, where warranted, compensation/offset measures that are technically and economically feasible along with inspection and monitoring programs.
- Predict anticipated residual effects and cumulative effects.

- Determine the significance of residual Project-related and cumulative effects.
- Identify the need for, and design of, follow-up programs to address areas of uncertainty that require further study.

3.1.3.1 Environmental and Socio-Economic Setting

The environmental and socio-economic settings described in the application were compiled based on the following sources.

- Existing published literature including topographic maps, aerial photography, scientific papers and reference books, as well as municipal, provincial and federal government maps, reports, interactive websites, guides, information letters, fact sheets and databases.
- Consultation and engagement with Aboriginal communities (including Aboriginal Traditional Knowledge, TEK, TLU, TMRU, socio-economic studies) and landowners, regulatory authorities, stakeholders and the general public.
- Biophysical: geotechnical, soil, groundwater, air quality, greenhouse gas (GHG), acoustic, fish, wetland, vegetation, wildlife, and marine biophysical field studies conducted for the Project.
- Socio-Economic: heritage resources, traditional land and resource use, socio-economic, community health, economic studies, human health, marine commercial, recreational and tourism use, and traditional marine use studies.

The biophysical setting for the pipeline and associated facilities, including marine resources in the vicinity of the Westridge Marine Terminal, is described in Volume 5A (Sections 5 and 6) and supporting technical reports (Volume 5C). Technical reports provide discipline-specific background information, methodologies and results of field surveys and research conducted in support of the ESA. The socio-economic setting for the pipeline and facilities, including Westridge Marine Terminal, is described in Volume 5B (Sections 5 and 6) and supporting technical reports (Volume 5D). The environmental and socio-economic setting for marine transportation is described in Volume 8A (Section 4.2) and supporting technical reports (Volume 8B).

3.1.3.2 Elements, Indicators and Measurement Endpoints

The potential environmental (*i.e.*, biophysical) and socio-economic elements interacting with the Project were identified through: consultation and engagement described above; experience gained during previous pipeline projects with similar conditions/potential issues (*e.g.*, TMX - Anchor Loop Project, Trans Mountain Pump Station Expansion Project, Blue River Pump Station Project); available research literature; and the professional judgment of the ESA team.

An indicator (sometimes called Valued Ecosystem Components or Valued Social Components) is defined as a biophysical, social or economic property or variable that society considers being important and is assessed to predict Project-related changes and focus the impact assessment on key issues. One or more indicators were selected to describe the present and predicted future condition of an element. The list of indicators initially proposed by the ESA team was modified based on feedback from consultation and engagement (*e.g.*, more than ten indicators were changed). One or more measurement endpoints (measurable parameters) were then

identified for each indicator to allow quantitative or qualitative measurement of potential Project effects. Societal views were understood by the assessment team through published information such as management plans and engagement with regulators, the public, Aboriginal communities and other interested groups.

Biophysical and socio-economic indicators selected for the pipeline and associated facilities, and marine transportation volumes are described in the appropriate subsection below.

3.1.3.3 Assessment Boundaries

The ESA considers the potential environmental and socio-economic effects of the Project within defined spatial and temporal boundaries selected for each biophysical and socio-economic element. More than two thirds of the length of the proposed pipeline corridor parallels the existing TMPL system right-of-way in order to reduce the environmental effects and facilitate efficient pipeline operations. However, paralleling the existing TMPL system right-of-way was not possible in all cases because of engineering, constructability, geotechnical, environmental, socio-economic and/or Aboriginal concerns or for other reasons. In these locations, potential alternative corridors were examined. While the proposed pipeline will generally require a construction right-of-way of 45 m, it was decided to study a wider corridor (generally 150 m) to accommodate locations where field information was unavailable due to lack of access to public lands or where additional consultation and input from the environmental, socio-economic, geotechnical or other disciplines would be beneficial to guide final placement of the proposed pipeline centreline and associated right-of-way. It is recognized that corridor and route refinement is an iterative process that will continue throughout the review phase of the Project as more information becomes available.

Temporal boundaries reflect the anticipated duration of Project phases and activities (*i.e.*, planning, construction, operations, decommissioning and abandonment) and the period over which effects could occur. The ESA considers three aspects of temporal context: Duration – the period of the event causing the effect; Frequency – how often the event that causes the effect would occur; and Reversibility – the period of time over which the effect extends.

Individually established element-specific assessment spatial boundaries are described within the discussions in Volumes 5A (Section 7.0) and 8A (Section 4.3) for each applicable biophysical element and Volumes 5B (Section 7.0) and 8A (Section 4.3) for each applicable socio-economic element. Trans Mountain actively sought comments and suggestions on spatial boundaries during public consultation and Aboriginal engagement, and as a result the marine transportation study area was expanded from Burrard Inlet to include the entire shipping route from Burrard Inlet, through the Strait of Georgia, Haro Strait and Juan de Fuca Strait to the 12-mile nautical limit. Spatial boundaries include one or more of the following areas.

- A **Footprint Study Area** consisting of the area directly disturbed by surveying, construction and clean-up of the pipeline and associated physical works and activities (including, where appropriate, the permanent right-of-way, pump stations, tanks, Westridge Marine Terminal, temporary construction workspace, temporary stockpile sites, temporary staging facilities, construction camps, access roads, power lines).

- A **Local Study Area (LSA)** consisting of the zone of influence or area where the element and associated indicators are most likely to be affected by Project construction and operation. This generally represents a buffer from the centre

of the proposed pipeline corridor or edge of the facility or from the outermost edge of each shipping lane.

- A **Regional Study Area (RSA)** consisting of the area extending beyond the LSA boundary where the direct and indirect influence of other activities could overlap with project-specific effects and cause cumulative effects on the indicator. For each element considered, a separate spatial RSA boundary was established in consideration of the regional effects of the Project on the individual element.
- A **Provincial Area** that extends beyond regional or administrative boundaries, but is confined to Alberta and BC.
- A **National Area** that extends beyond Alberta and BC but is confined to Canada.
- An **International Area** that extends beyond Canada.

3.1.3.4 Mitigation Measures

Mitigation measures mean measures for the elimination, reduction or control of a project's adverse effects, including replacement, restoration and compensation/offsets. Siting, routing, and mitigation measures are key components of both the ESA and Project design because they ensure that potential adverse environmental and socio-economic effects, and Project contribution to cumulative effects, are avoided, reduced, or offset.

For the pipeline and associated facilities, mitigation measures developed to reduce potential adverse residual effects for each environmental and socio-economic element are outlined in the ESA, the Project-specific EPPs (Volumes 6B through 6D) as well as element-specific technical reports (Volumes 5C, 5D, and 8B). Accompanying this ESA are Environmental Alignment Sheets (Volume 6E) which identify where some site-specific mitigation measures are to be implemented. These EPPs will be revised prior to construction to reflect changes that occur as a result of the hearing process and ongoing consultation.

For the purposes of the Project-related increase in marine traffic, since Trans Mountain has limited control over the actions of vessel owners and operators, mitigation is considered to include existing regulations and shipping standards that are monitored by federal and international authorities (*e.g.*, PMV, Pacific Pilotage Authority, Canadian Coast Guard, Transport Canada, United States Coast Guard and International Maritime Organization). In addition, mitigation has been proposed where Trans Mountain is able to influence development and implementation of measures intended to reduce potential impacts (*e.g.*, the extended use of escort tugs in the Strait of Georgia and Juan de Fuca Strait).

General and site-specific mitigation measures recommended in this ESA are based on current industry-accepted standards, consultation with regulatory authorities, landowners, stakeholders, and the general public, engagement with Aboriginal communities, and the professional judgment of the assessment team. Mitigation measures suggested by regulatory authorities or other stakeholders have been incorporated into this assessment. Many of the mitigation measures presented in this ESA have been discussed with Aboriginal communities that have been involved in specific supporting environmental studies. A comprehensive review of all the issues that have been raised by each community and the recommended mitigation measures

was conducted with each community during the field surveys and during follow-up results review (Section 3.0 of Volume 5A, 5B and 8A).

Enhancement measures have been developed to promote the likelihood of potential socio-economic residual effects where a positive impact balance was identified. Implementation of the proposed mitigation measures will further reduce the adverse residual socio-economic effects associated with the construction and operation of the Project.

To meet environmental commitments and permit requirements during Project activities, Trans Mountain will implement an environmental inspection and monitoring program that includes management oversight, on-site environmental inspection, various environmental training programs for all on-site personnel and access to other environmental resources (*e.g.*, wildlife biologists, water quality monitors) on an as needed basis.

Trans Mountain will conduct a PCEM program during a period up to the first five complete growing seasons (or during years one, three and five) following commissioning of the Project and as a consequence of conditions that may be attached to the CPCN. The PCEM Program will be initiated following clean-up activities, in order to identify any unresolved issues upon the completion of construction. The purpose of the PCEM Program is to evaluate the success of reclamation and effectiveness of mitigation measures used in areas disturbed during construction; identify environmental issues that may have arisen post-construction on an Environmental Issues List (a monitoring and compliance management tool); and coordinate the implementation of remedial measures that are warranted to address outstanding or new environmental issues.

3.1.3.5 Project-specific Residual Effects and Cumulative Effects

Project-related environmental and socio-economic effects are changes to the biophysical or human environment that are caused by construction, operation, decommissioning and abandonment phases of each component of the Project. This includes the effects of malfunctions or accidents that may occur in connection with the Project. Cumulative environmental and socio-economic effects are changes to the biophysical or human environment that are caused by the Project, in combination with existing activities and reasonably foreseeable developments.

As defined in the NEB Filing Manual (NEB 2013c), residual effects are the environmental and socio-economic effects that are present after mitigation measures are applied. In some situations, the mitigation measures are predicted to eliminate the potential adverse effects while in many other situations, the mitigation measures are more likely to lessen the effects, but not entirely eliminate them. The significance of elements for which no residual effects are predicted is not evaluated.

Project-related residual environmental and socio-economic effects and the Project's contribution to cumulative environmental and socio-economic effects are assessed sequentially. Project-specific environmental and socio-economic effects are discussed first, taking into account Project design measures and mitigation that help to reduce or avoid environmental and socio-economic effects. Predicted Project-related residual environmental and socio-economic effects are then characterized using specific criteria (*e.g.,* magnitude, reversibility, probability) to provide a clear and transparent significance assessment conclusion as described under the Evaluating Significance heading below.

Finally, the potential for cumulative effects from the Project in combination with existing and reasonably foreseeable (unrelated to the Project) developments is described and the Project's contribution to cumulative effects is then evaluated for significance. As per Guides A.2.6 and A.2.7 of the NEB *Filing Manual*, if a physical, biological or socio-economic element or indicator evaluated in the Project-related effects assessment has no residual effects predicted or effects are not considered likely, then these elements or indicators are excluded from the cumulative effects assessment. The assessment of cumulative effects includes developments considered to be "certain" or "reasonably foreseeable" based on publicly available information as of May 31, 2013. Project contributions to cumulative effects are predicted or discussed for each indicator or element and detail about Project design and recommended mitigation measures to be implemented by the Project or others is provided.

The scope of the cumulative effects assessment is a project-specific cumulative effects assessment as required under the *CEA Act, 2012* which is appropriate for the scale of the Project. Project-specific cumulative effects assessments must determine if that particular project is incrementally responsible for adversely affecting a given element. They may also assist municipal, provincial and federal agencies by identifying requirements for additional planning, monitoring or mitigation that are beyond the direct control of the proponent and need to be implemented or led by others. Therefore, the total cumulative effect on a given environmental or socio-economic indicator must be identified; however, the cumulative effects assessment must also make clear to what degree the project under review is contributing to that total effect, and the significance of these effects.

3.1.3.6 Evaluating Significance

The NEB Filing Manual requires applicants to include an evaluation of whether or not adverse effects are "significant" and "likely", and to describe the method used to reach these conclusions. Note that the significance evaluation is based on the criteria or method used, and does not mean that effects that are not significant are not important to Trans Mountain, regulatory authorities, landowners, Aboriginal communities, stakeholders and the general public.

The significance of some elements can be assessed quantitatively using regulatory standards, guidelines, objectives or other established accepted thresholds. Where there are no standards, guidelines, objectives or other established and accepted thresholds to define quantitative rating criteria or where quantitative thresholds are not appropriate, the qualitative method that is based on available literature and professional judgment is considered to be the appropriate method for determining the significance of most of the potential residual and cumulative effects. Consequently, the significance is evaluated relative to a set of qualitative criteria that describe: impact balance; spatial boundary; temporal context; magnitude; probability of occurrence; and level of confidence. The ecological context is also considered for each applicable element. Significance criteria definitions are included in Volumes 5A, 5B and 8A.

The anticipated magnitude of residual effects is related to one of four pre-defined categories: Negligible – no detectable change from baseline conditions; Low – changes are detectable and comparatively small; Medium – changes are detectable but consistent with management guidelines or societal views; and High – changes are beyond management guidelines or would be considered severe based on societal views.

Potential effects of credible worst case and smaller spills discussed in Volume 7 and 8A are not evaluated for significance because these represent low probability, hypothetical events.

3.1.3.7 Follow-up Programs

Under the *CEA Act, 2012* and as described in the NEB Filing Manual, a follow-up program is defined as a program to verify the accuracy of the environmental assessment of a designated project, and to determine the effectiveness of any mitigation measures. Follow-up programs are typically implemented when assessment conclusions are uncertain, or unproven mitigation measures are being implemented.

Based on Project assessment and comprehensive field studies to date, the need for follow-up programs under the *CEA Act, 2012* have been identified for select wildlife species at risk and various indicators within the Socio-economic Management Plan. Trans Mountain plans to collect additional information in 2014 to enhance baseline data and to further support the mitigation strategies recommended in the EPPs. Where warranted, additional follow-up studies may be recommended.

3.2 Biophysical Effects

This subsection provides an integrated summary of key issues and findings for individual biophysical (used interchangeably with environmental) resources or elements, considering Project activities and components (pipeline, associated facilities, Westridge Marine Terminal, increase in marine shipping activities). The conclusions presented here are structured to consider overall Project effects and the significance of those effects. This integrated summary differs from the more detailed information in Volumes 5A, 7, and 8A, which is organized by Project component (*i.e.,* pipeline, associated facilities; Westridge Marine Terminal; and marine transportation) followed by resource topic. The different reporting structure used here is intended to integrate material from several documents and provide a general overview to readers interested in one or more environmental resources or elements.

The biophysical component of the ESA for the Project was prepared using the scope and methods described in Section 3.1. Biophysical elements potentially interacting with the Project include:

- physical elements such as the physical and meteorological environment, soil and soil productivity, water quality and quantity, onshore and marine air emissions, onshore and marine GHG emissions and the acoustic environment;
- biological elements such as fish and fish habitat, wetland loss or alteration, vegetation, wildlife and wildlife habitat, and species at risk; and
- marine elements such as marine sediment and water quality, marine fish and fish habitat, marine mammals, marine birds and marine species at risk.

3.2.1 Physical Environment and Soil

The physical environment and soil subsection includes physical features (physiography, bedrock, topography, geology) and soil included in the NEB *Filing Manual* for the Physical and Meteorological Environment, and Soil and Soil Productivity elements. Meteorological conditions contributing to flooding, river ice build-up, seismicity, fire, changing climate and sea level rise are addressed under changes to the Project caused by the environment in Volume 5A. The ESA evaluates seven indicators listed below to consider potential effects associated with ground instability, wind or water erosion, acid generating rock, soil condition and contamination and proposed mitigation and monitoring.

Element	Indicators
Physical and Meteorological Environment	· Terrain instability. · Topographic change. · Acid generating rock.
Soil and Soil Productivity	· Soil productivity. · Soil degradation. · Bedrock and stone disposal. · Soil contamination.

Marine transportation will not affect these physical features or soil, therefore, overall Project and cumulative effects on the physical environment and soil are described in Sections 7 and 8 (soils only) of Volume 5A. Construction activities have the potential to degrade soils and alter existing topography, and a number of mitigation measures to minimize these effects are identified and described in more detail in the EPPs and on the Environmental Alignment Sheets (Volumes 6B, 6C, 6D, 6E). Regulator and public consultation and Aboriginal engagement related to physical environment and soils were conducted for the Project. Key issues identified included geotechnical stability, soil conservation and erosion, concerns with clubroot disease, and restoration of agricultural lands.

The Project will result in some permanent, but localized changes in topography and these are considered to be irreversible, but of low to medium magnitude. Potential effects from acid-generating rock are considered to be unlikely. The severity and extent of terrain instability are rated as low magnitude as a result of construction, but are concluded to be reversible in the short- to medium-term, and not significant.

One soil issue identified was the potential for introduction and spread of clubroot disease as a result of Project construction, however, this was considered to be unlikely. With application of proven mitigation measures, all other Project effects on soils, and Project contribution to cumulative effects, are generally concluded to be of low magnitude, reversible in the short to medium-term, and not significant.

Well-established mitigation measures exist for physical features and soil productivity, and all Project-effects on physical environment and soils are concluded to be not significant.

3.2.2 Air Resources

The air resources subsection combines the NEB *Filing Manual* elements: Air Emissions, GHG Emissions; and Acoustic Environment. The ESA evaluates seven indicators listed below to consider potential effects associated with: air emissions from vehicles, heavy equipment, aircraft, marine vessels, tanks and facilities, including Westridge Marine Terminal; GHG emissions from the pipeline, temporary facilities, pump stations, tanks, Westridge Marine Terminal, and marine vessels; and atmospheric/ground borne noise and vibration from blasting, heavy equipment, pump stations and facilities, pile driving at Westridge Marine Terminal and marine vessels during construction and operations.

Element	Indicators
Air Emissions	· Primary emissions of criteria air contaminants (particulate matter [PM], carbon monoxide [CO], nitrous oxide [N_2O] and sulphur dioxide [SO_2]) and volatile organic compounds (benzene, toluene, ethylbenzene and xylene). · Secondary smog-related products like ozone and $PM_{2.5}$. · Hydrogen sulphide (H_2S) and mercaptans emissions (odour potential). · Fugitive emissions from pump stations. · Visibility (Marine Transportation).
GHG Emissions	· Common GHGs such as methane (CH_4), carbon dioxide (CO_2), N2O and sulphur hexafluoride (SF_6). · Effect of Project on climate change.
Acoustic Environment	· Sound levels. · Vibrations.

Potential effects on air resources were assessed quantitatively. Pipeline and associated facility effects on air emissions, GHG emissions, and the acoustic environment are described in Sections 7 and 8 of Volume 5A while effects from Project-related marine vessel traffic are described in Sections 4.3 and 4.4 of Volume 8A. Proposed mitigation measures are also described in these sections as well as in the EPPs (Volumes 6B, 6C, 6D). Regulator and public consultation and Aboriginal engagement related to air resources were conducted for the Project. Key issues identified included potential odours during construction and operation, dust during construction, noise pollution and vibration during construction.

Both intermittent and periodic air emissions will occur during construction, and periodic and continuous emissions will occur during the operations phase. Changes in ambient air quality are likely to result, however, predicted concentrations are within environmental or regulatory standards and are considered to be of low to medium magnitude, depending on the contaminant and location and are not significant. Emissions will continue for the duration of the operations period. Emissions from marine vessels are reversible shortly after Project-related marine vessels leave the region. Potential overlap between emissions from the Westridge Marine Terminal and shipping traffic was considered in this evaluation.

The Project will result in estimated GHG emissions from pipeline and facilities construction and operation representing <0.5% of annual provincial and <0.15% of annual national GHG emissions. Estimated GHG emissions from additional Project-related marine shipping activity represents 3.5% of estimated provincial marine emissions (this is predicted to exceed reported regional shipping emissions, although the publicly available estimate likely underestimates actual emissions by one to two orders of magnitude). Combined emissions are predicted to contribute to a small but permanent net increase in global GHG and have a negligible and not significant effect on climate change.

A construction noise management plan will be implemented to reduce residual effects on the acoustic environment. Pipeline and facility construction will result in short-term isolated noise and vibration that is predicted to be detectable but within regulatory standards. Pump stations, and Westridge Marine Terminal, and additional marine shipping activity will contribute continuous to periodic noise during operations, but predicted noise levels are also within established standards and not significant.

3.2.3 Freshwater Aquatic Resources

The freshwater aquatic resources subsection combines the NEB *Filing Manual* elements: Water Quality and Quantity; Fish and Fish Habitat; Wetlands; and aquatic Species of Special Status and Related Habitat. The ESA evaluates 20 indicators listed below to consider potential effects associated with: construction and operation of the pipeline, associated facilities and watercourse crossings; and surface water withdrawal during construction.

Element	Indicators
Water Quality and Quantity	· Surface water quality. · Surface water quantity. · Groundwater quality. · Groundwater quantity.
Fish and Fish Habitat	· Riparian habitat. · Instream habitat. · Fish mortality or injury. · Indicator species include: · Alberta: Arctic grayling; Athabasca rainbow trout; bull trout; burbot; northern pike; and walleye; and · BC: bull trout/Dolly Varden; Chinook salmon; coho salmon; cutthroat trout; and rainbow trout/steelhead.
Wetland Loss or Alteration	· Wetland function.
Species at Risk	· Fish species at risk (*i.e.*, bull trout and coho salmon).

Pipeline and associated facility environmental effects and cumulative effects on water quality and quantity, fish and fish habitat, wetland loss or alteration, and freshwater fish species at risk are described in Sections 7 and 8 of Volume 5A. Proposed mitigation measures are also described in these sections as well as in the EPPs (Volumes 6B and 6C). Regulator and public consultation and Aboriginal engagement related to freshwater aquatic resources were conducted for the Project. Key issues identified included watercourse crossing methods and disturbances, groundwater and protection and restoration of wetlands.

The Project is unlikely to affect groundwater quality or quantity following implementation of industry-standard mitigation measures. Surface water quality and flow will be altered during construction, but most effects are concluded to be reversible within 1 to 10 years and of low to medium magnitude and are considered not significant.

The magnitude of predicted Project and combined disturbance to fish habitat is quantified at the RSA scale using watershed-metrics. Effects on fish and fish habitat will also occur primarily during pipeline watercourse crossing construction, but increased access and potential indirect effects on fish harvest will continue during operations. Changes to instream habitat generally will be of low magnitude and reversible within 1 to 10 years while disturbed riparian (bank) habitat will recover over the medium to long-term depending on the existing vegetation community (*e.g.*, grass or trees). Combined effects on fish indicator species and species at risk are concluded to be of low magnitude, reversible in the medium to long-term and not significant.

The Project will disturb wetlands during construction and a number of mitigation measures will be implemented to ensure recovery of wetland function. Follow-up wetland monitoring conducted for the TMX - Anchor Loop Project, indicates that effects are expected to be reversible in the medium to long-term, of low magnitude and not significant.

3.2.4 Vegetation

The vegetation subsection combines the NEB *Filing Manual* elements: Vegetation; and vegetation Species of Special Status. The ESA evaluates four indicators listed below to consider potential effects associated with the construction and operation of the pipeline, associated facilities and Westridge Marine Terminal. Note that wetlands are discussed in Section 3.2.3.

Element	Indicators
Vegetation	· Vegetation communities of concern. · Plant and lichen species of concern. · Presence of infestations of provincial weed species and other invasive non-native species identified as a concern.
Species at Risk	· Vegetation species at risk.

Pipeline and associated facility effects and cumulative effects on vegetation and vegetation species at risk are described in Sections 7 and 8 of Volume 5A. Proposed mitigation measures are also described in these sections as well as in the EPPs (Volumes 6B, 6C, 6D). Regulator and public consultation and Aboriginal engagement related to vegetation were conducted for the Project. Key issues identified included restoration of native vegetation, weed concerns and the protection of rare plants/rare plant communities.

Project effects on vegetation will occur primarily during the construction period and recovery will occur over the medium to long-term depending on the existing vegetation community (*e.g.*, grass or trees). The level of vegetation community disturbance is quantified at both the LSA and RSA scale. Vegetation species or communities of concern include a number of vascular and non-vascular plants and the bunchgrass grassland community in the BC southern interior which has been disturbed or altered by existing activities. Specific mitigation measures are identified to minimize effects on these vegetation species or communities and residual effects are concluded to be of low to medium magnitude and not significant. Project contribution to cumulative effects on vegetation species and communities has been reduced by routing the proposed pipeline corridor to parallel existing linear disturbances for most of its length. The potential for weed introduction and spread is evaluated, along with mitigation measures to minimize residual effects. Weed introduction will be minimized through implementation of effective industry standard measures during construction and operation phases and combined residual effects on vegetation are concluded to be not significant.

3.2.5 Wildlife and Wildlife Habitat

The wildlife and wildlife habitat subsection combines the NEB *Filing Manual* elements: Wildlife and Wildlife Habitat; and wildlife Species of Special Status and Related Habitat. The ESA evaluates 26 indicators listed below to consider potential effects associated with the construction and operation of the pipeline, associated facilities and Westridge Marine Terminal.

Element	Indicators
Wildlife and Wildlife Habitat	· Mammals: grizzly bear; moose; woodland caribou; forest furbearers; coastal riparian small mammals; and bats. · Birds: grassland/shrub-steppe birds; mature/old forest birds; early seral forest birds; riparian and wetland birds; wood warblers; short-eared owl; rusty blackbird; flammulated owl; Lewis's woodpecker; Williamson's sapsucker; western screech-owl; great blue heron; spotted owl; bald eagle; common nighthawk; northern goshawk; and olive-sided flycatcher. · Reptiles: arid habitat snakes. · Amphibians: lentic (pond-dwelling) amphibians; and lotic (stream-dwelling) amphibians.
Species at Risk	· Wildlife species at risk (*i.e.*, grizzly bear, woodland caribou, short-eared owl, rusty blackbird, flammulated owl, Lewis's woodpecker, Williamson's sapsucker, western screech-owl, great blue heron [*fannini* ssp.], spotted owl, common nighthawk, northern goshawk [*laingi* ssp.] and olive-sided flycatcher).

Pipeline and associated facility effects and cumulative effects on wildlife and wildlife species at risk are described in Sections 7 and 8 of Volume 5A. Proposed mitigation measures are also described in these sections as well as in the EPPs (Volumes 6B, 6C, 6D). Regulator and public consultation and Aboriginal engagement related to wildlife and wildlife habitat were conducted for the Project. Key issues identified included protection of species at risk and site-specific habitat features, preventing barriers to wildlife movement, mitigating effects of linear disturbance on predator-prey dynamics and human access, and prevention of contamination (*e.g.*, spills, leaks).

Project construction activities will result in loss or alteration of wildlife habitat; habitat recovery will occur over the long-term depending on the existing vegetation community (*e.g.*, grass or trees). The magnitude of Project and combined habitat-related effects is quantified at both the LSA and RSA scale using habitat models and effects are concluded to be of low to medium magnitude. Potential effects on movement and increased mortality risk will continue throughout the operation phase and these are generally evaluated qualitatively, with the exception of grizzly bear for which an accepted regional mortality risk modelling approach is applied.

Habitat of several species at risk that have been adversely affected by existing disturbance will be disturbed by Project construction and operation. Specific mitigation plans incorporating habitat restoration will be developed in conjunction with regulatory authorities for spotted owl, for grizzly bear in the North Cascade Grizzly Bear Population Unit, and for caribou in the Wells Gray and Groundhog woodland caribou herds. Effects are concluded to be not significant with implementation of these species-specific mitigation plans and other mitigation measures identified in the ESA.

3.2.6 Marine Environmental Resources

Marine environmental resources are not specifically identified as elements in the NEB *Filing Manual.* This grouping includes Marine Sediment and Water Quality, Marine Fish and Fish Habitat, Marine Mammals, and Marine Birds. The ESA evaluates 25 indicators listed below to consider potential effects associated with: construction and operation of Westridge Marine Terminal; as well as increase in Project-related marine shipping activities.

Element	Indicators
Marine Sediment and Water Quality	· Marine sediment quality (Westridge Marine Terminal and Marine Transportation) · Marine water quality (Westridge Marine Terminal and Marine Transportation)
Marine Fish and Fish Habitat	· Marine riparian habitat (Westridge Marine Terminal) · Intertidal habitat (Westridge Marine Terminal) · Subtidal habitat (Westridge Marine Terminal) · Dungeness crab (Westridge Marine Terminal) · Inshore rockfish (Westridge Marine Terminal) · Pacific salmon (Westridge Marine Terminal and Marine Transportation) · Intertidal habitat (Marine Transportation) · Pacific herring (Marine Transportation)
Marine Mammals	· Pacific harbour seal (Westridge Marine Terminal) · Southern resident killer whale (Marine Transportation) · Humpback whale (Marine Transportation) · Steller sea lion (Marine Transportation)
Marine Birds	· Bald eagle (Westridge Marine Terminal) · Great blue heron (Westridge Marine Terminal) · Pelagic cormorant (Westridge Marine Terminal, Marine Transportation) · Barrow's goldeneye (Westridge Marine Terminal) · Glaucous-winged gull (Westridge Marine Terminal, Marine Transportation) · Spotted sandpiper (Westridge Marine Terminal) · Fork-tailed storm petrel (Marine Transportation) · Cassin's auklet (Marine Transportation) · Surf scoter (Marine Transportation)

Regulator and public consultation and Aboriginal engagement related to marine environmental resources were conducted for the Project. Key issues identified included southern resident killer whales, effects to other marine resource users, and effects of construction at the Westridge Marine Terminal.

To be conservative, the ESA assumes that dredging will be required for Westridge Marine Terminal expansion. Dredging would result in short-term and low magnitude effects on marine sediment and water quality. During operations, stormwater will be treated according to permit requirements. Combined effects on marine sediment and water quality are concluded to be not significant.

Construction of the Westridge Marine Terminal is anticipated to result in loss or alteration of marine fish habitat. This could be offset within 10 years by construction of a subtidal rock reef through the marine fish habitat compensation/offset program and overall effects on marine fish indicators are concluded to be of low magnitude and not significant. This conclusion considers all marine fish species at risk. Modelling predictions indicate that vessel wake during the operations phase will have a negligible effect on marine fish and marine fish habitat is not likely to be affected by vessel wake during the operations phase, so combined effects on marine fish from terminal operation and shipping are not anticipated.

Westridge Marine Terminal construction will result in sensory disturbance of harbour seal and increased shipping activity will result in sensory disturbance of marine mammals from underwater noise. Effects on harbour seal in Burrard Inlet will be of medium magnitude and reversible within a few hours to a few months after the end of construction. Ship-related sensory disturbance will continue throughout the operations phase, however, animals affected by

vessels will recover immediately after a vessel passes by. Sensory disturbance is concluded to be of low to medium magnitude and not significant for humpback whale and Steller sea lion.

Construction of the Westridge Marine Terminal will result in loss or alteration of marine bird habitat that is concluded to be of low magnitude and reversible in less than ten years for all indicators. Construction and operation of the Westridge Marine Terminal and increased marine shipping will also result in sensory disturbance of marine birds near the terminal and along the shipping route. The effect of disturbance is concluded to be of low to medium magnitude, depending on species life history and tolerance and reversible in the short term. Potential effects on the indicator species and marine bird species at risk are not significant.

The ESA concludes that past and currently ongoing activities and the designation as a SARA listed species indicate there has been a significant adverse effect on the endangered southern resident killer whale population that uses the shipping lanes. Underwater noise modelling completed for the Project demonstrated that additional Project-related marine shipping transits will increase underwater noise and potential sensory disturbance of this population. While the Project's contribution to overall sensory disturbance effects is small, the potential effect of the increase in Project-related marine vessel traffic is considered to be high magnitude, high probability and significant for southern resident killer whales. With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic.

PMV is developing a collaborative multi-stakeholder program to look at the current levels of underwater noise in the Strait of Georgia and surrounding waters and to consider options for reducing potential cumulative environmental effects of noise from marine vessel traffic on marine mammals. Trans Mountain is strongly supportive of this regionally-focused collaborative approach to managing cumulative effects of the marine transportation industry as a whole and will continue discussions with PMV to establish how to best participate in current and future initiatives on this topic aimed at reducing the existing effects on southern resident killer whales.

3.2.7 Accidents and Malfunctions

The NEB *Filing Manual* requires an ESA to assess the environmental, socio-economic, and health effects of potential accidents and malfunctions. Small spills and other types of accidents and malfunctions are discussed in Section 7 of Volumes 5A and 5B and Section 4.3 of Volume 8A. Although TMPL's 60 year operating history combined with the risk assessment provided in the application demonstrate that the probability of a large pipeline, facility or tanker related spill is low, Aboriginal communities and the public-at-large consulted about this Project were concerned about catastrophic spills - those that are least likely but of highest consequence.

Volume 7 discusses potential environmental and socio-economic effects of credible worst-case and smaller oil spills (accidental releases) from the pipeline and Westridge Marine Terminal. Potential environmental and socio-economic effects of credible worst-case and smaller marine oil spills are discussed in Volume 8A. The spill effects assessment methodology and discussion provided differs from that adopted for routine pipeline, facility and marine shipping activities because spills represent low-probability events; the location and specifics of these events cannot be predicted. Rather than estimating potential residual effects and significance for each element and indicator discussed for routine activities, spill evaluations identify the potential consequences of large, unlikely spills based on evidence from past spills and incidents and consideration of a number of hypothetical scenarios. Ecological risk assessments provided for

each spill scenario describe the potential effects on ecological receptors that might be affected by an accidental spill.

No hypothetical scenario can represent all potential environmental and socio-economic outcomes; however, scenario-based oil spill evaluations can provide decision makers and resource managers with a clearer understanding of potential effects pathways, the range of potential outcomes and vulnerable resources. The four representative pipeline spill scenarios were chosen to reflect worst-case environmental outcomes, namely that spilled oil reaches a large river. The representative tanker spill scenario locations were based on risk assessment studies completed for the Project, but specific locations were selected in consideration of vulnerable or sensitive resources and receptors located nearby. These credible worst-case and smaller spill scenario evaluations help Trans Mountain and other responders confirm the appropriateness of existing ERPs and provide information on opportunities to enhance these plans for the Project.

Section 6.2 of Volume 7 provides information from previous studies of oil spills in freshwater and estuaries, including the Trans Mountain Westridge spill. Section 7 of Volume 7 summarizes ecological risk assessment results for four hypothetical pipeline spill scenarios: Athabasca River; North Thompson River; Fraser River near Hope; and Fraser River and Delta near the Port Mann Bridge. Section 8 of Volume 7 summarizes ecological risk assessment results for a credible worst-case and smaller spill at the Westridge Marine Terminal. These evaluations are conservative both because the scenarios are unlikely, and because the evaluations adopt the unrealistic assumption that initial emergency response efforts to contain or minimize the spill would be limited.

Section 5.6.2 of Volume 8A summarizes ecological risk assessment results for three hypothetical tanker spill scenarios: Strait of Georgia; Race Rocks; and Arachne Reef in the Turn Point Special Operating Area. Beneficial effects of mitigation through spill response are also described.

3.3 Socio-Economic Effects

This subsection provides an integrated summary of key issues and findings for individual socio-economic topics or elements, considering Project activities and components (pipeline, associated facilities, Westridge Marine Terminal and increase in marine shipping activities). The conclusions presented here are structured to consider overall Project effects and the significance of those effects. Note, however, that this integrated summary differs from the more detailed information in Volumes 5B, 7 and 8A, which is organized by project component (*i.e.*, pipeline, associated facilities; Westridge Marine Terminal; and marine transportation) followed by resource topic. The different reporting structure used here is intended to integrate material from several documents as a general introduction to readers interested in one or more socio-economic topics or elements.

Socio-economic elements potentially interacting with the Project include heritage resources, traditional land and resource use, social and cultural well-being, human occupancy and resource use, infrastructure and services, employment and economy, community health, human health and aesthetics, TMRU, and marine commercial, recreational and tourism use.

3.3.1 Heritage Resources

The heritage resources subsection represents the NEB *Filing Manual* element of the same name and considers potential effects on archaeological, palaeontological, and heritage (historic)

resources. The ESA evaluates three indicators listed below to consider potential effects associated with the pipeline and associated facilities, including Westridge Marine Terminal.

Element	Indicators
Heritage Resources	· Archaeological sites. · Historic sites. · Palaeontological sites.

Pipeline and associated facility effects on heritage resources are described in Section 7 of Volume 5B along with proposed mitigation measures. Regulator and public consultation and Aboriginal engagement related to heritage resources were conducted for the Project. Key issues identified included archaeological artifacts and the Archaeological Permit Application.The ESA concludes that because Project disturbances to heritage resources are effectively offset by knowledge gained through the mitigation approved by the provincial regulatory authorities, no residual effects on heritage resource indicators are identified.

3.3.2 Traditional Land and Resource Use

The ESA evaluates three indicators listed below to consider potential effects associated with traditional land and resource use the pipeline and associated facilities, including Westridge Marine Terminal. Potential effects associated with the increase in Project-related marine shipping activities are discussed under Section 3.3.8.

Element	Indicators
Traditional Land and Resource Use	· Subsistence activities and sites · Cultural sites · TMRU (Westridge)

Traditional land use studies were initiated for the Project in 2012 and are ongoing as TERA-facilitated or community directed studies using a third-party consultant. Trans Mountain provided funding to assist Aboriginal communities that elected to conduct their own community-directed TLU. Many TLU sites have been identified through these studies and mitigation measures have been developed to address them as summarized in Sections 7 and 8 of Volume 5B. Aboriginal engagement related to traditional land and resource use was conducted for the Project. Key issues identified included effects to traditional lands and traditional resource users, disruption of the environment (*e.g*., forests and species at risk), and potential effects to the aquatic environment (*e.g.*, freshwater fish habitat) from construction.

Project activities may disturb subsistence activities and sites, cultural sites and TMRU activities. Effects would be temporary and associated with construction or maintenance activities during the operation phase. Recovery would be short to long-term depending on the resource or activity affected and the magnitude of most effects is considered to be medium, but not significant as a result of mitigation measures that will be implemented to reduce potential effects.

In late November and early December 2013, Trans Mountain received interim TLU study results from Lower Nicola Indian Band. The interim report identifies concerns that have been recognized in the ESA as well as a suite of mitigation measures in the Project-specific EPPs that may address the concerns raised. In addition, TMRU study reports received from Cowichan Tribes, Hwlitsum First Nation and Penelakut First Nation identify concerns related to the Project-

related increase in vessel traffic and the potential effects of a marine spill. While Trans Mountain was unable to fully incorporate the results of these TMRU studies into the ESA at the time of filing the application, the issues raised in these draft TMRU study reports were also identified broadly through Trans Mountain's ongoing engagement activities with all three communities. Trans Mountain is committed to reviewing the results of these TMRU studies in the context of the ESA and will report on the findings during the proceedings.

3.3.3 Human Occupancy and Resource Use

The human occupancy and resource use subsection combines the NEB *Filing Manual* elements Human Occupancy and Resource Use, Navigation and Navigation Safety, and Aesthetics and considers potential effects on navigation and a wide variety of land and resource uses. The ESA evaluates nine indicators listed below to consider potential effects associated with the pipeline and associated facilities, including Westridge Marine Terminal. Potential effects associated with the increase in Project-related marine shipping activities are discussed in Section 3.3.8.

Element	Indicators
Human Occupancy and Resource Use	· Parks and protected areas. · Indian Reserves, Métis Settlements and asserted traditional territories. · Residential use. · Agricultural use. · Outdoor recreation use. · Other land and resource use. · Water supply and use. · Aesthetic attributes.
Navigation and Navigation Safety	· Navigable watercourses.

Pipeline and associated facility effects and cumulative effects on human occupancy and resource use are described in Sections 7 and 8 (human occupancy and resource use only) of Volume 5B. Proposed mitigation measures are also described in these sections. Project effects are associated with direct disturbance, sensory disturbance, change in land use patterns, change in perceived quality of land use activities, and direct or indirect effects on resources used for commercial and industrial purposes. Regulator and public consultation and Aboriginal engagement related to human occupancy and resource use were conducted for the Project. Key issues identified included effects to recreational use on and off the right-of-way, routing close to residences, schools and other highly populated areas and sensory disturbance.

Combined Project effects on parks and protected areas, outdoor recreation use and aesthetic attributes are concluded to be an inconvenience or nuisance (low magnitude) and reversible in the short-to long-term. Combined effects on Indian Reserves, and asserted traditional territories are generally concluded to be of medium magnitude and associated with construction and maintenance activities. Overall effects on residential use, agricultural use, and other land uses are also considered to be of medium magnitude and reversible in the short to long-term, depending on the type of use. All combined effects are concluded to be not significant with implementation of mitigation measures.

Effects on navigation and navigation safety are concluded to be of low magnitude, reversible in the short-term, and not significant.

3.3.4 Community Well-being

The community well-being subsection includes social and cultural well-being and community health disciplines that represent the NEB *Filing Manual* element Social and Cultural Well-being and Human Health. The ESA evaluates 10 indicators listed below to consider potential effects associated with the pipeline and associated facilities, including Westridge Marine Terminal. The increase in Project-related marine shipping activities will not affect these indicators.

Element	Indicators
Social and Cultural Well-being	· Population and demographics. · Income levels and distribution. · Community way-of-life. · Aboriginal culture.
Community Health	· Socio-economic health effects. · Infectious diseases. · Environmental health effects. · Public safety. · Health care service provision. · Aboriginal health.

Pipeline and associated facility effects and cumulative effects on social and cultural well-being and community health are described in Sections 7 and 8 of Volume 5B, along with mitigation measures proposed to reduce potential effects. Regulator and public consultation and Aboriginal engagement related to community well-being were conducted for the Project. Key issues identified included traffic management and the influx of temporary workers to communities.

Most social and cultural effects will be restricted to the construction phase, and all will be influenced by the size of the Project-related workforce in relation to the population and labour force of various host communities that serve as construction and operation hubs. As a result, many potential effects are concluded to range from negative to neutral in small communities where changes would be comparatively greater, to neutral or positive in large communities where relative changes would be much less. Overall effects on Aboriginal culture are considered neutral. All effects on social and cultural well-being are considered to be of low to medium magnitude, reversible in the short to long-term, and not significant.

Potential health outcomes will also include both beneficial and adverse effects on overall and individual health, mental well-being, and the incremental use of specific health services. Operations at the Westridge Marine Terminal could contribute to anxiety about the potential for contamination regardless of actual risk. Potential benefits are linked to increased income while adverse effects are associated with changes in the social environment and support networks or decreases in social and community services. With the exception of the Westridge Marine Terminal, most effects will be restricted to the construction phase and combined effects are concluded to range from negligible to medium magnitude and reversible within the year following construction. Effects on health care services will be comparatively larger in small communities than large communities. Effects on Aboriginal health are concluded to be negligible to low magnitude during construction. All potential effects are considered to be not significant.

3.3.5 Infrastructure and Services

The infrastructure and services subsection represents the NEB *Filing Manual* element of the same name and considers potential effects on: local and regional infrastructure; roadways, housing; and local and regional emergency response employment. The ESA evaluates seven indicators listed below to consider potential effects associated with the pipeline and associated facilities, including Westridge Marine Terminal. The increase in Project-related marine shipping activities will not affect these indicators.

Element	Indicators
Infrastructure and Services	· Transportation infrastructure. · Linear infrastructure and power supply. · Waste and water infrastructure. · Housing. · Educational services. · Emergency, protective and social services. · Recreational amenities.

Pipeline and associated facility effects and cumulative effects on infrastructure and services are described in Sections 7 and 8 of Volume 5B, along with mitigation measures proposed to reduce potential effects. Regulator and public consultation and Aboriginal engagement related to infrastructure and services were conducted for the Project. Key issues identified included the use of roads, hotels and food services by temporary workers, power supply to communities and utility crossings.

Most effects on infrastructure and services are associated with increased demand or disturbance during the construction phase, but Project operation will affect power supply and other linear infrastructure. Demand for short-term accommodation and emergency, protective, and social services could exceed supply in smaller communities and Trans Mountain will develop a Code of Conduct for employees and contractors and Worker Accommodation Strategy in collaboration with municipal and regional offices to reduce such effects. With implementation of these mitigation measures, effects on infrastructure and services are concluded to be of low to medium magnitude, generally reversible in a year following construction, and not significant.

3.3.6 Employment and Economy

The employment and economy subsection represents the NEB *Filing Manual* element of the same name and considers potential effects on local and regional employment, business opportunities and government revenues. The ESA evaluates six indicators listed below to consider potential effects associated with the pipeline and associated facilities, including the Westridge Marine Terminal. The increase in Project-related marine shipping activities will have negligible effects on these indicators and is not considered further.

Element	Indicators
Employment and Economy	· National and provincial economies. · Regional employment. · Municipal economies. · Contracting and procurement. · Training and capacity development. · Business and livelihood disruption.

Pipeline and associated facility effects on employment and economy are described in Section 7 of Volume 5B, along with mitigation measures proposed to reduce potential effects. Regulator and public consultation and Aboriginal engagement related to employment and economy were conducted for the Project. Key issues identified included property values, economic benefits and taxes (including municipal, provincial and federal) and the use of local businesses and workers.

The socio-economic assessment concludes that significant positive long-term effects will result for municipal, provincial, and national economies and that positive low to medium magnitude effects on regional employment and contracting and procurement will occur during the construction and operation phases. Disruption of business and commercial income in urban areas during construction is considered unlikely because measures will be implemented to reduce noise, dust and access disturbance and compensation will be negotiated in some form for any proven economic loss. Combined effects on employment and economy are concluded to be of low to high magnitude. Adverse effects are considered not significant while positive effects range from not significant to significant.

3.3.7 Human Health

The human health subsection considers potential human health effects for the NEB *Filing Manual* element of the same name. The ESA evaluates two indicators listed below to consider potential effects associated with the pipeline and associated facilities, including operations at Westridge Marine Terminal as well as the increase in Project-related marine shipping activities.

Element	Indicators
Human Health	· Residents (Aboriginal peoples, urban dwellers, non-urban dwellers). · Area users.

Summaries of human health risk assessment findings for potential health risks to people associated with short and long-term exposure to additional tanks at the Edmonton, Sumas and Burnaby terminals and expansion of the Westridge Marine Terminal are provided in Sections 7 and 8 of Volume 5B. Findings of a human health risk assessment completed for Project-associated routine marine shipping activities is provided in Volume 8A, Section 4.3. Regulator and public consultation and Aboriginal engagement related to human health were conducted for the Project. Key issues identified included health effects from airborne contaminants, including health effects from odours near terminals.

Using extremely conservative assumptions, the terminal tank evaluation concluded that exposure levels are well below levels associated with health effects and adverse health risks are not expected for residents or area users. The human health risk assessments for Westridge Maine Terminal and routine marine vessel traffic also used extremely conservative assumptions and concluded that exposure levels for most chemicals of potential concern are below levels associated with health effects. A few exceedances were identified but based on weight of evidence it is unlikely that people would experience health effects as a result of Westridge Marine Terminal expansion or increased marine shipping activities. Detailed quantitative human health risk assessments will be completed to expand on these findings and conclusions and will be submitted in early 2014.

3.3.8 Marine Socio-economic Resource Use

Marine socio-economic resource use elements address the marine-specific components of NEB *Filing Manual* elements of Human Occupancy and Resource Use, Navigation and Navigation Safety and Traditional Land and Resource Use, interpreted in a marine context. The marine transportation assessment does not consider effects related to: Heritage Resources, Social and Cultural Well-being, Infrastructure and Services, or Employment and Economy, as the *Filing Manual* guidance for these elements is largely not pertinent in a marine transportation setting. The ESA evaluates six marine socio-economic resource use indicators listed below.

Element	Indicators
TMRU	· Subsistence activities and sites. · Cultural sites.
Marine Commercial, Recreational and Tourism Use	· Commercial fisheries and aquaculture. · Marine transportation. · Marine recreational use. · Marine tourism use.

Note: Westridge Marine Terminal elements for socio-economic are included in previous elements

Pipeline and associated facility effects and cumulative effects on TMRU and marine commercial, recreational and tourism use are described in Sections 7 and 8 of Volume 5B, along with mitigation measures proposed to reduce potential effects. Potential effects of Project-related increased marine shipping activities are described in Sections 4.3 and 4.4 of Volume 8A. Aboriginal engagement related to TMRU was conducted for the Project. Key issues identified included effects on navigation for traditional marine users, effects to traditional marine resources, and potential accidents or malfunctions.

Construction and operation of the Westridge Marine Terminal and increased vessel activity may result in disruption of marine access and use patterns for a variety of subsistence, commercial, recreational and tourism users. The combined effects are anticipated to be primarily related to terminal construction. Effects will be that of an inconvenience or nuisance for most, be generally reversible within 10 years following construction, and considered not significant.

Trans Mountain has initiated TMRU studies with the Aboriginal communities that were interested in participating, and these studies are ongoing. Many traditional use sites have been identified through these studies and mitigation measures have been and continue to be developed to address them as summarized in Volume 8A. With one exception, effects of increased marine shipping will not have significant effects on TMRU. Existing activities have had a significant adverse effect on the Endangered southern resident killer whale population that uses the shipping route and this has affected the availability of this species for subsistence use. With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. The continuation of this adverse effect on the southern resident killer whale population would be partially attributed to the Project-related increase in tanker traffic, although it is impossible to quantify this contribution.

Increased routine marine shipping activities will have low to medium magnitude effects on commercial fishing, marine transportation, and marine recreational and tourism use. These could include disruption of normal user activities, disruption of rail traffic on the Second Narrows

Bridge, changes to existing movement and activity patterns, and sensory disturbance of other users. Effects are concluded to be reversible and not significant.

3.3.9 Accidents and Malfunctions

To comply with regulatory requirements and address public concerns, Volume 7 discusses potential environmental and socio-economic effects of credible worst-case and smaller oil spills (accidental releases) from the pipeline and Westridge Marine Terminal. Potential environmental and socio-economic effects of credible worst-case and smaller marine oil spills are discussed in Volume 8A.

Accidents and malfunctions are unplanned events that could result in serious adverse effects to human health, property or the environment, but are unlikely to occur. Industry best practice technology, safety measures and contingency plans also contribute to reduce the probability and magnitude of accidents occurring, while response actions reduce the magnitude of adverse effects. Trans Mountain adopts KMC's plans and policies for the purposes of the Project. Management systems and programs are required under the OPR. While accidents and malfunctions are predicted to be unlikely for the Project, the potential consequences are evaluated so that emergency response and contingency planning can be continually improved so the risk is further mitigated.

The pipeline industry and regulators have developed routine, yet effective, approaches to avoid or minimize the long-term effects of land-based spills on landowners, resource tenure holders, properties, and people's health. These include immediate notification of emergency responders and local, provincial and federal public health officials who are able to implement controls to limit long-term exposure and chronic effects potential, if warranted.

Potential socio-economic effects of credible worst-case and smaller marine and freshwater spills will vary depending on the exact location and nature of the incident, and will be influenced by factors including: distance from human settlements; size and population density of nearby human settlements (*e.g.*, rural versus urban areas); particular patterns of resource use in the vicinity (*e.g.*, commercial, recreational, traditional); key economic activities and sectors in areas that may be reached by the spill, in particular the presence of resource-based economic activities (*e.g.*, tourism, commercial fisheries, traditional uses by Aboriginal communities); constant change that is occurring in socio-economic conditions of any community or region; and the role of human interpretation and its influence on individuals' physical and perceptual experiences of social effects.

3.4 ESA Conclusions and Significance Determination

The ESA for the pipeline and facilities components of the Project concludes that the Project will not have a significant adverse effect on any biophysical or socio-economic element, provided the proposed mitigation measures are implemented. Some potential residual socio-economic effects are positive, particularly where related to increased business, employment opportunities and economic benefits. The ESA concludes that the Project will have two significant positive effects related to provincial and national benefits and increased municipal taxes in local communities.

The ESA for the marine transportation component of the Project concludes that past and currently ongoing activities and the designation as a SARA-listed species indicate there has been a significant adverse effect on the endangered southern resident killer whale population that uses the shipping lanes. Underwater noise modelling completed for the Project

demonstrated that additional Project-related marine shipping transits will increase underwater noise and potential sensory disturbance of this population. While the Project's contribution to overall sensory disturbance effects is small, the potential effect of the increase in Project-related marine vessel traffic is considered to be high magnitude, high probability and significant for southern resident killer whales.

With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. PMV is developing a collaborative multi-stakeholder program to look at the current levels of underwater noise in the Strait of Georgia and surrounding waters and to consider options for reducing potential cumulative environmental effects of noise from marine vessel traffic on marine mammals. Trans Mountain is strongly supportive of this regionally-focused collaborative approach to managing cumulative effects of the marine transportation industry as a whole and will continue discussions with PMV to establish how to best participate in current and future initiatives on this topic aimed at reducing the existing effects on southern resident killer whales.

4.0 PROVINCIAL INTERESTS

The proposed TMEP has been routed to parallel the majority of the existing TMPL system which already crosses the provinces of Alberta and British Columbia. By paralleling the existing system to the maximum extent possible, Trans Mountain will be able to make use of existing infrastructure and minimize potential environmental effects. The Project is designed to increase the system capacity from 300,000 bbl/d to 890,000 bbl/d, which will improve access for Western Canadian oil producers to growing West Coast and offshore Pacific Rim markets and thereby support favourable pricing of Canadian heavy crude oil. The TMEP will provide employment opportunities and long-term revenues for both provinces and at the same time it will have environmental and socio-economic effects; as a result, both provinces are interested in ensuring the potential benefits and effects of the Project are carefully considered and managed appropriately.

On November 5, 2013, the premiers of Alberta and BC announced a framework agreement between the two provinces on moving energy resources to new markets (Government of Alberta 2013). Agreement was reached in the following areas:

- *"…. the Government of British Columbia [will] endorse Premier Redford's Canadian Energy Strategy."*
- *"The governments of B.C. and Alberta agree that British Columbia's conditions are intended to ensure both the responsible production of energy as well as its safe transport to new markets, giving projects the social license to proceed."*
- *"B.C.'s conditions 1-4 are designed to achieve both economic benefit and risk mitigation on increased shipments through B.C. They mirror Alberta's legislated commitments on responsible energy production. Alberta and B.C. agree that only through intensive environmental review and protection, enhanced marine safeguards and First Nations support, can projects proceed. On condition five, Alberta agrees that B.C. has a right to negotiate with industry on appropriate economic benefits. Both governments agree it is not for the governments of Alberta and B.C. to negotiate these benefits. Both provinces reaffirmed that Alberta's royalties are not on the table for negotiation."*

The framework is meant to address concerns that BC raised in July 2012. At that time BC announced five requirements (generally referred to as the BC Five Conditions) that must be established for BC to consider support for heavy oil pipelines (Government of British Columbia 2012):

- *Successful completion of the environmental review process;*
- *World-leading marine oil spill response, prevention and recovery systems for B.C.'s coastline and ocean to manage and mitigate the risks and cost of heavy oil pipelines and shipments;*
- *World-leading practices for land oil-spill prevention, response and recovery systems to manage and mitigate the risks and costs of heavy oil pipelines;*
- *Legal requirements regarding Aboriginal and treaty rights are addressed, and First Nations are provided with the opportunities, information and resources necessary to participate in and benefit from a heavy-oil project; and*

- *British Columbia receives a fair share of the fiscal and economic benefits of a proposed heavy oil project that reflects the level, degree and nature of the risk borne by the province, the environment and taxpayers.*

In the preparation of this application, Trans Mountain has taken into consideration the interests and concerns expressed by both provinces, in particular the BC Five Conditions enunciated by the Province of British Columbia. Trans Mountain has endeavoured to address these conditions in this application through a comprehensive analysis of the potential benefits, effects, and risk mitigation for the expansion. Provincial interests are reviewed below, using the themes of the BC Five Conditions as a template, and within the context of the regulatory process now underway for the Project. If approved by the NEB, the construction and long-term operation of the Project including the associated marine activities will be done to the highest standards of environmental performance, support Aboriginal communities, and benefit all British Columbians, Albertans and Canadians.

4.1 Successful Completion of the Environmental Review Process

The NEB has a well-established process to review Trans Mountain's application for the Project. The NEB is an independent, quasi-judicial tribunal with a mandate to determine whether the Project is in the public interest. In conducting its review of the Project, the NEB must consider the potential environmental, social and economic effects of the project. The NEB has internal experts on pipeline construction, operation and safety and will conduct a review of the design and safety of the Project. In addition, the NEB will also consider the potential impacts on affected Aboriginal groups, landowners and other stakeholders in making its recommendation. The NEB process is designed to ensure the Project is reviewed thoroughly and that affected parties have the opportunity to participate in the process, question the evidence presented by any party to the proceeding and file evidence if they choose.

This application is comprised of 21 volumes including over 15,000 pages of information that address the NEB's List of Issues (Section 1.3). To ensure that the potential effects of the Project along the pipeline and marine corridors, both positive and negative, are fully reviewed, and in addition to Trans Mountain's own evidence, sixty-five expert reports have been commissioned by Trans Mountain and are included in the application. Trans Mountain has engaged with more than one-hundred Aboriginal communities and Aboriginal groups and thousands of landowners and neighbours, including stakeholder communities and groups along the pipeline right-of-way. These engagements are documented in the Volumes 3A, 3B, and 3C of the application.

On July 29, 2013 the NEB released the List of Issues (NEB 2013a) to be considered by the NEB during the review process for the Project. As noted in the List of Issues, the Board stated that it does not intend to consider the environmental and socio-economic effects associated with upstream activities, the development of oil sands, or the downstream use of the oil transported by the pipeline but has included the potential effects of marine shipping activities. An assessment of potential environmental and socio-economic effects, the ESA, is provided in Volumes 5A, 5B and 8A of this application. The NEB's List of Issues for the Project are:

1. *The need for the proposed project.*
2. *The economic feasibility of the proposed project.*
3. *The potential commercial impacts of the proposed project.*

4. *The potential environmental and socio-economic effects of the proposed project, including any cumulative environmental effects that are likely to result from the project, including those required to be considered by the NEB's Filing Manual.*

5. *The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed Project, including the potential effects of accidents or malfunctions that may occur.*

6. *The appropriateness of the general route and land requirements for the proposed project.*

7. *The suitability of the design of the proposed project.*

8. *The terms and conditions to be included in any approval the Board may issue.*

9. *Potential impacts of the project on Aboriginal interests.*

10. *Potential impacts of the project on landowners and land use.*

11. *Contingency planning for spills, accidents or malfunctions, during construction and operation of the project.*

12. *Safety and security during construction of the proposed project and operation of the project, including emergency response planning and third-party damage prevention.*

The NEB does not intend to consider the environmental and socio-economic effects associated with upstream activities, the development of oil sands, or the downstream use of the oil transported by the pipeline.

The NEB also released Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project (September 10, 2013) (NEB 2013b), effectively determining the scope of the ESA and the factors to be assessed.

Based on the regulatory process that applies as described in this section and in Section 1.3 of this volume, Trans Mountain's evidence, and the participation of intervenors and stakeholders in the NEB process will ensure that a rigorous and comprehensive environmental review will be completed by the NEB for the Project. Trans Mountain believes the NEB's environmental and public interest review of the Project, will meet BC's condition 1 (successful completion of the Environmental Review Process).

4.2 World Leading Marine Oil Spill Preparedness and Response

While Trans Mountain does not own or operate the vessels calling at the Westridge Marine Terminal, it is responsible for ensuring the safety of the terminal operations. The Project will result in an increase in tanker traffic to transport the additional volumes that will arrive at Westridge.

The Westridge Marine Terminal has been in operation since 1953. Trans Mountain has developed its own screening process and terminal procedures and all vessels calling at Westridge must operate according to rules established by the International Maritime

Organization, Transport Canada, the Pacific Pilotage Authority, and Port Metro Vancouver (PMV). Although Trans Mountain is not responsible for vessel operations, it is an active member in the maritime community and works with BC maritime agencies to promote best practices and facilitate continuing improvements to ensure the safety and efficiency of tanker traffic in the Salish Sea.

Marine spill response is one part of an overall safety regime that also includes prevention. The safety regime in place today for both tanker traffic and the Westridge Marine Terminal has been developed and continually improved since the terminal entered service in 1953. The regime is based on regulatory requirements, local experience and international best practices. It is comprehensive, well established, and has proven to be safe and effective.

Vessel traffic in the Salish Sea is well managed and important risk controls have been established for all traffic and for oil tankers in particular. Existing risk controls are considered to be state of the art compared to other coastal sailing routes worldwide and in line with global best practices. The risk reducing measures in place today include:

- Inspection of vessels under Port State Control;
- Screening of vessels by charterer and Trans Mountain;
- Aids to Navigation;
- Traffic Separation Protocol;
- Oversight by Vessel Traffic Services;
- Mandatory BC Pilotage;
- Mandatory use of modern navigation equipment;
- Mandatory use of escort tugs; and
- Mandatory participation in spill response regime.

To mitigate the effect of increased tanker traffic a number of enhancements are recommended which, if implemented, will raise the level of care and safety in the Salish Sea to well above globally accepted shipping standards. The primary recommendations include extending tug escorts for laden tankers throughout Strait of Georgia and Juan de Fuca Strait and implementing a moving exclusion zone around laden tankers. In addition to these preventative measures, Trans Mountain is proposing significant improvements to the oil spill response regime for the area, which will be further modified in accordance with anticipated changes to future Canadian Federal regulations and standards.

These recommendations for prevention and response enhancements were informed by a quantitative risk assessment that has been prepared to meet both the requirements of the NEB review as well as a voluntary review of marine safety that Trans Mountain has requested of Transport Canada.

The risk assessment considered regional traffic growth, navigational hazards, vessel construction, and risk controls provided under the existing safety regime. The assessment quantified the risk of spills from tankers in terms of probable spill volume. Further work was conducted to assess the fate and behavior of oil in the local marine environment. This included

testing of diluted bitumen weathering and spill trajectory modelling to establish the extent of potential oil spill effects including those on the environment and human health.

This process was used to identify the recommended enhancements to the safety regime that will reduce the potential for oil spill accidents and mitigate the risk presented by increased tanker traffic. It was also used to assess the adequacy of the existing marine spill response planning standards and recommend enhancements.

Trans Mountain engaged WCMRC to review this work and to describe enhancements to the existing planning standards that would better accommodate the Project. In addition to providing WCMRC with results of the risk assessment, Trans Mountain proposed the following principles:

- Augment capacity within the existing regime. Where the need exists for additional response capacity, it should be met through an expansion of WCMRC's resources.
- Response capacity should reflect the risks. Response capacity should be established based on consideration of probability and consequence with particular consideration to predicted spill volumes, material fate and behavior, and geographic setting including sensitive areas.
- Investments should benefit affected communities. Where new investment in response capacity is required, Trans Mountain will seek to maximize the benefit to First Nations and other communities along the transit route. Benefits may consist of capacity building, capital investment, training and provision of ongoing services.

The enhanced planning standards for marine spill response described by WCMRC will result in a regime that is able to deliver 20,000 tonnes of capacity within 36 hours from dedicated resources staged within the study area. This represents a response capacity that is double and a delivery time that is half the existing planning standards. These enhancements will reduce times for initiating a response to a maximum of two hours for the harbour and six hours for the remainder of the study area and parts of the West Coast of Vancouver Island. These reduced times will be achieved by creating new base locations along the tanker route. Meeting the response capacities within the designated times requires redundancy of equipment, and as a result the overall capacity of dedicated response equipment available in the area will be in excess of 30,000 tonnes. In addition WCMRC maintains mutual aid agreements in place with several oil spill response organizations in Canada and the United States. The standard for cleaning of oiled shoreline is also improved significantly from 500 to 3,000 m/day.

The WCMRC study serves as a practical example of how response capacity could be enhanced to better accommodate the Project. While recognizing that there are alternative means to achieve similar results, Trans Mountain is supportive of the enhanced capacity and the general means of implementation described by WCMRC.

On March 18, 2013 the Government of Canada announced a number of measures toward the creation of a world-class tanker safety system. The implementation of eight tanker safety measures was announced along with the introduction of the *Safeguarding Canada's Seas and Skies Act*, and the creation of a Tanker Safety Expert Panel (the Panel) to review Canada's current tanker safety system and propose further measures to strengthen and bring Canada's tanker safety system to a world-class status.

On October 10, 2013, BC released a comprehensive study assessing current marine-spill preparedness and response capabilities on the West Coast. The report points to where resources and efforts need to be dedicated in order to improve response, readiness and recovery on the West Coast. In the report the current response standard is considered inadequate. Trans Mountain has considered this report in the context of tankers in the Salish Sea.

On December 3, 2013 the federal Minister of Transport, the Honourable Lisa Raitt, released the report by the Panel, providing recommendations resulting from its review of the current state of Canada's ship-source oil spill preparedness and response regime south of the 60th parallel.

Trans Mountain has reviewed the Panel's recommendations and notes that those related to preparedness and response are consistent with the process Trans Mountain followed to conduct its marine risk assessment and to develop the subsequent assessment of response requirements. Trans Mountain concurs with the Panel's finding that emergency response and preparedness measures need to be tailored to the geographic setting and in response to the unique risks in each region in Canada, particularly in the Salish Sea. Overall, Trans Mountain is supportive of the Panel recommendations and looks forward to working with the Federal Government on their implementation.

Trans Mountain is supportive of these complementary efforts led by the federal and provincial governments, and will continue to play an active role to support and work with WCMRC, regulatory agencies, Aboriginal groups, and to implement the requisite enhancements.

4.3 World Leading Land Oil Spill Preparedness and Response

Effective oil spill preparedness and response includes; i) minimizing and managing the risk of spills, ii) developing plans to respond to potential spills including containment and remediation and compensation, and iii) ensuring sufficient financial resources are in place to contain, remediate and compensate.

The Trans Mountain pipeline has been in operation since 1953. KMC, as operator of TMPL, is responsible for land oil spill preparedness and response along the pipeline including the Westridge Marine Terminal. KMC must have the necessary resources and plans to ensure the safety of the public and the environment in the event of an oil spill, and ensure that clean-up is timely and effective. Accordingly, KMC has an established Emergency Management Program that is central to KMC's response to an emergency. The Emergency Management Program is effectively managed through an ICS and is comprised of a number of supporting plans including KMC's ERPs, Control Point and Field Guide Manuals. The NEB enforces the OPR and among other things is responsible for monitoring and auditing the Emergency Management Program and the ERPs.

Key elements of the ERPs include information on responder health and safety, initial response actions, communication and notification protocols, site assessment, containment and recovery methods, protection of sensitive areas including wildlife protection, multiple hazard checklists and a description of the incident management system. ERPs are based on regulatory compliance, operational need, industry best practice, lessons learned through regular exercises and past spills and guidance provided by CAN/CSA – Z731-03 - Emergency Preparedness and Response (CSA 2003). In addition, provincial regulations are also considered including, Alberta Energy Regulator Directive 71, BC guidelines for Industrial Emergency Plans, and Emergency Response Management System Standards. Continuing education and consultation with first

responders, provincial authorities, municipalities, Aboriginal communities and the public adjacent to the pipeline is a key component of the ERPs.

KMP's current Emergency Management Program and ERPs are in the process of being updated to reflect the increased emergency response requirements arising from the Project. Some of the needed revisions to ERPs will come from ongoing consultations with emergency responders and anticipated specific public input during the NEB hearing process.

Geographic control points required for any new right-of-way for the routing of Line 2 will be identified and clearly documented along with any redistribution of the seven existing or addition of new OSCAR units and associated emergency response equipment and personnel. The Westridge Marine Terminal will require additional oil spill equipment including boom and skimmers to deal with any operational spills. Rapid deployment, boom reels may be established on shore to isolate all three berths and the two nearby municipal storm water outfalls. This booming capability is in addition to the normal booming that will continue to occur with each individual vessel berthed at the dock.

KMC was an early adopter of the ICS to manage emergency response. The ICS structure outlines clear roles and responsibilities with respect to emergency response. It represents organizational "best practices" and includes a unified command structure for co-ordination with the multiple levels of government; federal, provincial, municipal, and Aboriginal communities, along the pipeline. The NEB uses ICS for emergency response management through participation in Unified Command, as well as integration of staff within the response structure. The Province of BC employs ICS for provincial emergency programs, and the Province of Alberta is currently developing similar standards as is the Canadian Coast Guard.

As a member of the Canadian Energy Pipeline Association, KMC is a signatory to the recent Mutual Emergency Assistance Agreement between member companies. This agreement strengthens individual company emergency response capacity through commitment and leveraging of management, equipment, and resources. The agreement will formalize an already existing practice whereby member companies can share resources during an emergency. KMC will be able to draw upon the resources of all the member companies should it be necessary.

On November 28, 2012, the BC Ministry of Environment (BC MOE) released the Land Based Spill Preparedness and Response in British Columbia Policy Intentions Paper for Consultation (BC MOE 2012). The Intentions Paper introduced a process to implement industry funded options for strengthening BC's spill preparedness and response policies and capacity, and invited public input in the following three areas:

- world leading regime for land based spill preparedness and response;
- effective and efficient rules for restoration of the environment following a spill; and
- effective government oversight and coordination of industry spill response.

In response to the Intentions Paper, KMC submitted comments and with the pipeline industry as a member of the Canadian Energy Pipeline Association, as did other stakeholders. The BC MOE subsequently established four workgroups to develop elements of a world leading land oil spill preparedness and response regime. The working groups met throughput 2013 and have engaged in discussions in the areas of spill prevention and preparedness; spill response standards; environment and natural resource recovery; and funding and governance.

Recognizing the existing compliment of manpower, equipment, policies and procedures already established by federal regulation, Trans Mountain is committed to continued dialogue with BC and other stakeholders and supports the efforts to strengthen oil spill preparedness and response in the province. One example already underway that aligns with the principles outlined in the Intentions Paper is Trans Mountain's consultation with Aboriginal communities which has indicated an interest in participation in emergency response planning and programs with some communities already participating. The integration of Aboriginal communities provides opportunity for reduced response time in some locations and additional workforce to respond to a spill.

The Canadian federal government has recently announced that they intend to propose regulations to enshrine a polluter pay principle for on-shore federal pipelines and require that companies operating major crude oil pipelines have a minimum of $1 billion in financial capacity to respond to releases (National Resources Canada 2013). Trans Mountain has always operated under the principle of polluter pay and is supportive of this principle being enshrined in regulation. Trans Mountain currently has access to $750 million of spill liability insurance and financial capacity above that. In the event that a new financial capacity standard is required (*i.e.,* $1 billion), Trans Mountain will meet that standard.

4.4 Addressing Aboriginal and Treaty Rights

As a company that has had existing pipeline operations in BC and Alberta for 60 years, Trans Mountain has worked hard to build upon existing and establish new relationships, and foster trust and respect to ensure there is meaningful consultation on the Project. Trans Mountain views working with Aboriginal communities along the route not through an obligatory legal lens, but rather as part of Trans Mountain's commitment to promote open and transparent consultation and communication with Aboriginal communities, and strives to build lasting and mutually beneficial relationships with these communities and with Aboriginal businesses.

In addition to the land-based communities along the pipeline, and in recognition of potential environmental and socio-economic effects of the increased tanker traffic, including the potential effects of an oil spill, Trans Mountain extended consultation to include Aboriginal communities along the marine corridor in the Salish Sea. Trans Mountain has engaged with over 100 Aboriginal communities and Aboriginal groups and at the time of filing this application with the NEB, Trans Mountain will have made more than 8,000 points of engagement in relation to the Project in an effort to provide comprehensive information and seek feedback on the Project and to identify anticipated impacts of the Project on the assertion of Aboriginal rights and title governing traditional and cultural use of the land and marine environment. Many communities have worked cooperatively with Trans Mountain in relation to the application; some openly and others on a strictly confidential basis at their request. Trans Mountain has executed 46 agreements including Letters/Memorandums of Understanding, capacity funding and integrated cultural assessments. The aggregate total dollar committed to date for capacity funding is approximately $6 million. To enhance knowledge about the environment and traditional and cultural use by Aboriginal communities along the corridor, a total of 37 communities have participated in TLU studies, 9 communities in TMRU studies, and 28 communities in Traditional Ecological Knowledge studies.

Trans Mountain has endeavored to gather Aboriginal perspectives on rights and asserted rights, and identify issues and concerns relating to those rights and the Project, and reach understandings or agreements that address potential infringement of Aboriginal rights affected by the Project. To date Trans Mountain has formally received issues and concerns from

12 communities having an interest in the Project. Some, although relatively few, have refused to engage at all, on the basis that they oppose oil pipelines in principal or believe that engagement is the duty of the Crown, and not the proponent's duty.

Trans Mountain is working with Aboriginal communities and other entities to provide procurement, employment and workforce development opportunities, and MBAs. Initially, Trans Mountain has established a funding program to contribute directly to initiatives that focus on education and training with pipeline construction and related skills that are transferable and allow for employment in many work environments. Trans Mountain is actively working to connect with Aboriginal businesses offering services or products relevant to Project construction or operation. Where new investment in oil spill preparedness and response capacity is required, Trans Mountain will seek to maximize the benefit to Aboriginal communities along the pipeline and marine corridor.

In addition to initiatives tied directly to the Project, Trans Mountain is working in partnership to help establish and grow skills in Aboriginal communities. Forty participants recently took part in the training offered by the First Nation Emergency Services Society, and now are provincially recognized as having the ability to respond to an emergency within a community. Trans Mountain is also involved with the BC-based organization, Skill Builder, which aims to develop a qualified pool of Aboriginal individuals and companies to compete for utility sector work. Trans Mountain is also working to set up a scholarship program for field technical and trades positions for permanent employment opportunities.

Trans Mountain understands that consultation is a process and not an event, and will be continuing its efforts to build positive long term relationships with the Aboriginal communities and Aboriginal groups that might have an interest in the Project or have Aboriginal interests potentially affected by the Project.

4.5 BC's Fair Share of Benefits

The construction and operation of the Project will provide substantial economic and fiscal benefits to Canada and its regions, especially BC and Alberta. There will be significant benefits to all Western Canadian oil producers, and to all Canadians and their governments.

Total employment benefits during the development phase and the first 20 years of the Project's operation will support approximately 108,000 person-years of employment across Canada. This increases by 15,000 person-years if all the TMEP spot capacity is utilized. Most of the employment impacts are expected to occur in Western Canada, with approximately 60 per cent of the total in BC and 25 per cent in Alberta.

Spending on the Project during the development (construction) phase is expected to generate approximately $1.2 billion of combined provincial and federal government revenues. Assuming federal tax revenues will be distributed across the provinces on a per capita basis, BC ($394 million) and Ontario ($307 million) will experience the largest combined federal and provincial fiscal effects. Other regions of the country, such as Alberta ($239 million), Quebec ($166 million), and the Prairies ($58 million) will also experience fiscal benefits.

Over the first 20 years of pipeline operations, an additional $2.5 to $3.3 billion in combined federal and provincial revenues is forecast to be generated. Assuming the lower end of this range and a per capita distribution of federal revenues, BC ($887 million) experiences the largest combined federal and provincial impact, followed by Ontario ($620 million), Alberta ($469 million) and Quebec ($352 million).

Producer revenues are forecasted to rise by $45.4 billion over the first 20 years of operations, as a result of the higher prices realized through the market access provided by the Project. These higher producer revenues are expected to generate total federal and provincial fiscal benefits of $14.7 billion. The federal government is expected to capture $6.1 billion or 41 per cent of the total through federal corporate income taxes. Assuming that federal tax revenues will be distributed across the provinces on a per capita basis, BC is expected to benefit by $805 million and Alberta by $673 million, which is less than the benefits expected for the more populous provinces of Ontario ($2.35 billion) and Quebec ($1.4 billion). The effect of the higher producer revenues on the combined royalty and provincial corporate income taxes for Alberta is estimated to be $8.2 billion, and for Saskatchewan it is $454 million.

Incremental property taxes paid by Trans Mountain to municipal governments are expected to increase by approximately $25 million per annum. Communities in BC are expected to receive increased property taxes of approximately $22 million, while Alberta communities will benefit by about $3 million annually.

In summary, Trans Mountain is supportive of the progress toward addressing the BC Five Conditions and of the framework agreement reached between the governments of BC and Alberta on moving energy resources to new markets. Trans Mountain believes that the information provided in this application will help continue and advance further dialogue between and with governments, Aboriginal communities and other stakeholders and industry. Trans Mountain is confident that the interests and concerns of both Alberta and BC can be addressed through the review process and ongoing dialogue.

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