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August 31, 2020

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC
V6Z 2N3

Attention: Ms. Marija Tresoglavic, Acting Commission Secretary

Dear Ms. Tresoglavic:

Re: FortisBC Energy Inc. (FEI)

Application for Approval of a Certificate of Public Convenience and Necessity (CPCN) for the Pattullo Gas Line Replacement Project (Application)

Pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), FEI applies to the British Columbia Utilities Commission (BCUC) for a CPCN for the Pattullo Gas Line Replacement Project (PGR Project or Project). The PGR Project is needed due to the Province of British Columbia's Pattullo Bridge Replacement Project, which includes the demolition of the existing Pattullo Bridge on which FEI's Pattullo Gas Line is mounted. The PGR Project is necessary for FEI to continue to deliver natural gas to approximately 35 thousand residential, commercial and industrial customers in the cities of Burnaby, New Westminster and other parts of Metro Vancouver who rely on natural gas to heat their homes and businesses.

FEI also seeks BCUC approval, pursuant to sections 59 and 61 of the UCA to establish a deferral account, entitled the PGR Application and Preliminary Stage Development Costs Deferral Account, to be amortized over three years and costs recorded in this deferral account to attract an after-tax weighted average cost of capital return.

Application Sections 5, 6, 7 and 8 will be filed in an evidentiary update

The Ministry of Transportation and Infrastructure's (MoTI) Pattullo Bridge Replacement Project necessitates FEI removing its gas line from the existing Pattullo Bridge. In order for the BCUC to commence review of the Application such that FEI may remove its gas line from the existing Pattullo Bridge to meet the MoTI's project schedule, FEI has filed the Application with Sections 5 through 8 omitted because Project Cost Estimates and preliminary Consultation Activities have not concluded as of the filing date. FEI will file Sections 5 through 8 in an evidentiary update as discussed in Section 1 of the Application.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Parties in the FortisBC Application for a Multi-Year Rate Plan for 2020 through 2024



FORTISBC ENERGY INC.

**Application for a Certificate of Public
Convenience and Necessity for the
Pattullo Gas Line Replacement Project**

Volume 1 - Application

August 31, 2020

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1. APPLICATION

1.1 INTRODUCTION

FortisBC Energy Inc. (FEI or the Company) applies to the British Columbia Utilities Commission (BCUC), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), for a Certificate of Public Convenience and Necessity (CPCN) for the Pattullo Gas Line Replacement Project (PGR Project or Project) as described in this application (Application). FEI also applies for approval of a deferral account, entitled the “PGR Application and Development Costs”, pursuant to sections 59 to 61 of the UCA, to record the costs of preparing the Application, developing the PGR Project prior to approval of this Application, and the regulatory review process.

The PGR Project is needed to replace the distribution system capacity currently provided by FEI's distribution pressure gas line affixed on the Pattullo Bridge (Pattullo Gas Line), which must be decommissioned in 2023 prior to the demolition of the Pattullo Bridge by the Province.

As will be described in detail in Section 5 of the Application, the PGR Project consists of the following:

- Constructing and installing in the City of Burnaby a 508 mm gas line that will operate at a maximum operating pressure (MOP) of 2,070 kPa;
- Constructing and installing a new district pressure regulating station (PRS);
- Constructing and installing a 508 mm gas line that will operate at a MOP of 700 kPa to connect the PRS to the distribution system;
- Abandoning and removing the existing Pattullo Gate Station in the City of Surrey and approximately 800 m of 508 mm gas line operating at a MOP of 700 kPa affixed to the Pattullo Bridge;
- Abandoning in place approximately 1.2 km of the remaining 508 mm gas line operating at a MOP of 700 kPa from the Pattullo Gate Station to the intersection of McBride Boulevard and Royal Avenue; and
- Modifying approximately 5.5 km of the Livingston-Pattullo 457 mm transmission gas line and associated work due to the removal of the Pattullo Gate Station.

For clarity, in requesting a CPCN for the PGR Project, FEI is requesting that the BCUC approve each of the components of the PGR Project set out above as will be described in Section 5 of the Application.

In order to maintain the safe and reliable supply of natural gas to customers in Burnaby, New Westminster and Coquitlam, FEI must complete the PGR Project prior to the demolition of the existing Pattullo Bridge under which the Pattullo Gas Line is affixed. The Ministry of Transportation and Infrastructure (MoTI) has denied multiple requests from FEI for approval to install a replacement gas line on the new bridge being constructed to replace the Pattullo Bridge (New Bridge). FEI pursued and examined a number of other alternatives, including trenchless

1 crossings, an aerial crossing of the Fraser River, a peak shaving facility, a virtual pipeline, and
2 various overland gas line routes (i.e., that do not require a crossing of the Fraser River).
3 However, after a comprehensive evaluation of all alternatives, FEI determined that an overland
4 gas line route through the City of Burnaby is the only feasible solution that can be completed in
5 advance of the MoTI's scheduled Pattullo Bridge demolition and meet the main Project objective
6 of replacing the distribution system capacity currently provided by the Pattullo Gas Line.

7 FEI began consultation with the City of Burnaby on the Project in February 2020, and has
8 continued to consult and negotiate with the City of Burnaby regarding the route for the Project
9 since that time. On July 20, 2020 City of Burnaby Council passed a recommendation brought
10 forward by the City's Finance Management Committee to "oppose the proposed FortisBC
11 Pattullo Gas Line Replacement Project pipeline route through Burnaby".¹ On July 31, 2020, the
12 City requested that FEI investigate a new route on Sperling Avenue (Sperling Route) in the City
13 of Burnaby as an alternative to FEI's previously identified route on Gaglardi Way (Gaglardi
14 Route). At the time of filing this Application, FEI is investigating the feasibility of the Sperling
15 Route.

16 In order to meet the stringent Project schedule requirements driven by the Province's Pattullo
17 Bridge Replacement Project, FEI must initiate the detailed design and procurement of long lead
18 material items in the first quarter of 2021. This will give FEI the necessary time to obtain all the
19 required permits and approvals prior to executing and completing the construction of the new
20 gas line in 2022. This would enable the decommissioning of the Pattullo Gas Line, Project
21 completion and Project close-out activities, including the removal of the Pattullo Gas Line and all
22 equipment in 2023, prior to the demolition of the Pattullo Bridge planned for the third quarter of
23 2023.

24 As outlined in detail in Section 1.4, to meet the Province's timelines, FEI is seeking an expedited
25 regulatory review process. In order to commence the regulatory process, FEI is filing this
26 Application with a number of components incomplete. FEI will be filing an evidentiary update by
27 the end of September 2020, the content of which will depend on FEI's continuing consultation
28 with the City of Burnaby, other stakeholders and Indigenous communities. If FEI has determined
29 by the end of September that the Sperling Route is not feasible or should not be pursued, then
30 FEI anticipates that the preferred route for the Project will be the Gaglardi Route and that it will
31 be able to provide the remaining information needed to complete the Application in its
32 evidentiary update at the end of September. However, if FEI determines that the Sperling
33 Route continues to look feasible and requires further investigation, then the evidentiary update
34 will provide an update to the alternatives analysis, and provide a timeline for when FEI will be
35 able to complete the Application. FEI currently anticipates that it could potentially complete the
36 Application based on the Sperling Route, if determined to be the preferred route, by the end of
37 November 2020.

¹ See Burnaby Council Minutes, Page 7 Section 4.8. Online:
<https://pub-burnaby.escrimemeetings.com/FileStream.ashx?DocumentId=47967>

Thus, whether in the first evidentiary update at the end of September, or the second at the end of November, FEI will provide:

- The results of FEI's consultation and negotiations with the City of Burnaby regarding the route for the Project (to be included in an addendum to Section 4 of the Application).
- A detailed description of the Project, including project components, final route selection process, basis of design and engineering, construction, project schedule and resourcing requirements, as well as a qualitative risk assessment and the risk analysis and contingency estimate (to be included as Section 5 of the Application);
- The cost estimate, the assumptions upon which the financial analysis is based, and the rate impacts (to be included as Section 6 of the Application);
- FEI's assessment of the potential environmental and archaeological impacts of the Project and measures to mitigate those potential impacts (to be included in Section 7 of the Application); and
- FEI's public consultation and communication efforts regarding the Project and FEI's consultation with Indigenous communities potentially impacted by the Project (to be included as Section 8 of the Application).

FEI respectfully requests that, with the filing of the initial information in the Application, the BCUC assign a Panel and have intervener registrations prior to the first round of information requests (IRs), which would commence after filing of the evidentiary update at the end of September. FEI believes that this approach is necessary to complete the PGR Project in time to meet the Pattullo Bridge Replacement Project schedule.

In addition, in order to commence the regulatory review process and meet the Project schedule, in the evidentiary update FEI will be providing the PGR Project cost estimate at an AACE Class 4 level of project definition. While the BCUC's CPCN guidelines prescribe an AACE Class 3 level of estimate, FEI believes a Class 4 level of estimate is sufficient in this case, given that:

- FEI will have undertaken additional preliminary constructability and other site reviews to better define the Project scope than is ordinarily completed for a Class 4 cost estimate.
- The Project budget will include a contingency estimate, determined through a comprehensive risk identification process, detailed qualitative assessment and a risk quantification analysis using the latest revision of AACE International Recommended Practices.
- The need for the PGR Project is driven by the demolition of the Pattullo Bridge, and, as such, project cost is not a factor in determining need.
- FEI's alternatives analysis of available overland gas line route options based on "apples-to-apples" Class 5 estimates shows that the route through the City of Burnaby has the lowest rate impact, in addition to being the only option that can be constructed in time to meet the Project schedule. As such, a more defined level of Project cost is not needed for the analysis of project alternatives.
- While a Class 4 estimate has a wider accuracy range than a Class 3 estimate, only prudently incurred costs may be recovered from customers in rates in any case.

For these reasons, FEI requests that the BCUC accept a Class 4 estimate as providing sufficient information on which to make a determination of whether the Project is in the public interest. This will allow the regulatory process to proceed so that FEI can meet the Project schedule driven by the Province's replacement of the Pattullo Bridge.

All other information presented in the Application is, or will be, consistent with the CPCN guidelines.

A draft Procedural Order and draft Final Order are included in Appendices B-1 and B-2 respectively.

1.2 EXECUTIVE SUMMARY

1.2.1 Need to Replace the Capacity Provided by the Pattullo Gas Line

FEI needs to undertake the PGR Project due to the Province's Pattullo Bridge Replacement Project, which includes construction of a New Bridge and demolition of the Pattullo Bridge on which FEI's Pattullo Gas Line is affixed. As explained in detail in Section 3.3, FEI's existing Pattullo Gas Line and its location within its natural gas system is integral in providing the following key benefits:

- Distribution system capacity to supply natural gas to customers in the Cities of Burnaby, New Westminster and Coquitlam; and
- Resiliency to FEI's larger Metro Vancouver area.

Specifically, as described in detail in Section 3.5 of the Application, the Pattullo Gas Line currently supplies all or a portion of natural gas to approximately 35,000 customers in Burnaby, New Westminster and Coquitlam. Not replacing the existing system capacity of the Pattullo Gas Line would lead to a loss of gas supply to approximately 10,700 customers during the coldest days of the year when peak demand occurs. This includes approximately 2,100 customers in Burnaby, 2,800 customers in New Westminster, and 5,800 customers in Coquitlam. Further, based on FEI's 20-year forecast, an additional 14,800 customers (for a total of approximately 25,500 customers) would be without gas during cold winter periods by 2039.

Therefore, FEI must replace the distribution system capacity of the Pattullo Gas Line prior to its decommissioning in 2023 to continue to provide safe and reliable natural gas supply to customers.

As explained in Sections 3.3.2 and 3.6 of the Application, in addition to distribution supply capacity, the Pattullo Gas Line provides system resiliency for customers in the Metro Vancouver area. By supporting flexible operation of the Metro Vancouver distribution system, this resiliency allows FEI to maintain safe and reliable supply to all customers during outages or failures of other feeds to the Metro Vancouver distribution system. FEI investigated and pursued

alternatives that would replace both the distribution capacity and the system resiliency benefits of the Pattullo Gas Line. However, FEI has determined that there is no feasible Project alternative that would replace the system resiliency benefits of the Pattullo Gas Line, while also meeting the schedule constraints of the PGR Project. Therefore, FEI concluded that the resiliency benefits of the Pattullo Gas Line cannot be replaced at this time and another project or system improvement will have to be undertaken at a later date to restore Metro Vancouver's system resiliency.

1.2.2 Alternatives Analysis Concluded Overland Gas Line Alternative is only Feasible Option

FEI conducted a comprehensive evaluation of the alternatives to meet the Project need and that would have the least impact, including consideration of technical design and scope complexity, cost, construction, environmental, archaeological and societal impacts, and impacts to FEI's existing system capacity and resiliency. FEI examined six alternatives and a number of sub-alternatives as listed below in Table 1-1, and described in further detail in Sections 4.3 and 4.4.

Table 1-1: Alternatives and Sub-Alternatives Considered for PGR Project

Alternatives and Sub-Alternatives Considered	
Alternative 1	Attachment to the New Bridge
Alternative 2	Trenchless Crossing of the Fraser River <ul style="list-style-type: none"> • Alternative 2A - High Pressure Horizontal Directional Drill (TP/IP HDD) • Alternative 2B - Distribution Pressure Horizontal Directional Drill (DP HDD) • Alternative 2C - Alternate High Pressure Horizontal Directional Drill (TP/IP) • Alternative 2D - Other Trenchless Methodologies (Micro-tunneling)
Alternative 3	Through Richmond with Fraser River Crossing <ul style="list-style-type: none"> • Alternative 3A - TP Gas Line with 1 Gate Station • Alternative 3B - IP Gas Line with 1 Gate Station and 1 District Station
Alternative 4	Aerial Gas Line Crossing
Alternative 5	Peak Shaving Facility / Virtual Gas Line <ul style="list-style-type: none"> • Alternative 5A - Liquefied Natural Gas (LNG) • Alternative 5B - Compressed Natural Gas (CNG)
Alternative 6	Overland Gas Line <ul style="list-style-type: none"> • Alternative 6A - Broadway and Gagliardi Way Corridor • Alternative 6B - Cape Horn Gate Corridor • Alternative 6C - Fraser Gate Corridor • Alternative 6D - Sperling Avenue Corridor

Alternative 1 is effectively a like-for-like replacement with the installation of a gas line on the New Bridge. FEI pursued this option from the time it initially received notice that it would need to decommission the Pattullo Gas Line and continued to pursue the option while simultaneously evaluating other alternatives until January 2020. FEI made multiple requests to MoTI for approval to install the gas line on the New Bridge. However, for the reasons explained in

Section 4.3.1.1, MoTI denied FEI's requests. Without approval from MoTI, this alternative is not feasible.

The next alternative that FEI evaluated was Alternative 2, a trenchless crossing of the Fraser River. FEI began pursuing this alternative in September 2018 after receiving MoTI's initial response in July 2018 denying FEI's request to install a gas line on the New Bridge. As explained in Section 4.3.2, after conducting preliminary designs, FEI engaged a drilling contractor as part of an early contractor involvement project delivery method to evaluate the constructability and feasibility of this alternative. FEI and the drilling contractor concluded in August 2019 that the drilling options were not feasible due to constructability issues and the low likelihood of successfully completing the drill and pipe installation.

After determining that Alternative 2 was not feasible, FEI proceeded to analyze all other alternatives beginning in August 2019. Due to the higher impact of these solutions, significant work on these alternatives was not started until more preferred options were deemed infeasible. Further, these remaining alternatives would not be like-for-like replacements, and would not be able to replace the resiliency benefits currently provided by the Pattullo Gas Line.

FEI screened out Alternatives 3, 4 and 5 based on their inability to meet the Project objectives as further explained in Section 4.3.3 through 4.3.5. This left Alternative 6: Overland Gas Line as the only feasible alternative to replace the system capacity provided by the Pattullo Gas Line while meeting Project schedule requirements.

Within Alternative 6, FEI identified three overland gas line route corridors (prior to the recent addition of 6D - the Sperling Route – as further explained below): 6A - Broadway and Gagliardi Way Corridor; 6B - Cape Horn Gate Corridor, and 6C - Fraser Gate Corridor. FEI compared the three route corridors using the financial and non-financial evaluation criteria in Table 1-2 below (specified in detail in Section 4.4.2).

Table 1-2: Alternatives Evaluation Criteria with Weightings

Evaluation Criteria	Weighting
<u>Non-Financial</u> <ul style="list-style-type: none"> Schedule Impacts Community, Indigenous and Stakeholder Impacts Environmental and Archaeological Impacts 	90%
<u>Financial</u> <ul style="list-style-type: none"> Levelized Delivery Rate Impact 	10%

FEI's evaluation of the three overland route corridors using the financial and non-financial criteria indicated that Alternative 6A (through the City of Burnaby) has the shortest schedule duration, least community impacts, and lowest financial impact based on AACE Class 5 conceptual cost estimates. Further, FEI concluded that Alternative 6A was the only route that could be constructed in time to allow FEI to decommission the Pattullo Gas Line before MoTI's scheduled demolition of the Pattullo Bridge.

FEI has been consulting and negotiating with the City of Burnaby regarding the route for the Project since February 2020. On July 31, 2020 the City requested that FEI investigate a new route option – the Sperling Route. FEI considers that it is important to determine if there is a feasible route that is supported by the City of Burnaby. If supported by the City, and other factors are favourable, the Sperling Route could be the most cost effective alternative for the PGR Project. Therefore, at the time of filing this Application, FEI is investigating the Sperling Route as well as continuing to advance the Gaglardi Route in the Gaglardi Way Corridor.

In an evidentiary update, FEI will provide the conclusion of its evaluation of the Sperling Route and analysis supporting FEI's preferred route for the Project.

1.2.3 Project Description

In an evidentiary update, FEI will provide Section 5 of the Application which will include a detailed description of the proposed Project, including project components, final route evaluation and selection process, basis of design and engineering, construction, project schedule and resourcing requirements, as well as a qualitative risk assessment and analysis and contingency estimate.

1.2.4 Project Costs and Rate Impact

In an evidentiary update, FEI will provide Section 6 of the Application which will include the Project cost estimate and the assumptions upon which the financial analysis and the rate impacts are based. The Project cost estimate will be provided in as-spent dollars including the Allowance for Funds Used During Construction (AFUDC) and cost of removal of the Pattullo Gas Line.

1.2.5 Environmental and Archaeological Evaluation

In an evidentiary update, FEI will provide Section 7 of the Application, which will describe the evaluation of the potential environmental and archaeological impacts of the PGR Project and FEI's plans to mitigate those potential impacts.

1.2.6 Consultation and Engagement

Consultation, engagement and communication with the public, local government, Indigenous communities and other stakeholders is a critical component in the development of FEI's PGR Project.

In an evidentiary update, FEI will provide Section 8 of the Application, which will describe FEI's public and other key stakeholders consultation and communication efforts regarding the Project, and FEI's consultation with Indigenous communities potentially impacted by the Project.

1.2.7 British Columbia's Energy Objectives and FEI's Long-Term Resource Plan

In alignment with considerations for the issuance of a CPCN, FEI confirms that the Project was identified within FEI's most recent 2017 Long Term Gas Resource Plan (2017 LTGRP), and will support British Columbia's energy objective of encouraging economic development and the creation and retention of jobs. The Project is anticipated to have positive employment impacts and will contribute to the local economy of British Columbia.

1.2.8 Conclusion

FEI submits that the Project is necessary and in the public interest. FEI requests that the BCUC grant a CPCN for the PGR Project as described in this Application, including any evidentiary updates.

1.3 APPROVALS SOUGHT

1.3.1 CPCN for PGR Project

Pursuant to sections 45 to 46 of the UCA, FEI requests that the BCUC grant a CPCN for the construction and operation of the PGR Project as described in the Application, including the September 2020 evidentiary update. In granting a CPCN for the PGR Project, FEI requests that the BCUC approve the components of the PGR Project as will be described in detail in Section 5 of the Application.

1.3.2 Application and Development Costs Deferral Account

Pursuant to sections 59 to 61 of the UCA, FEI requests approval of a deferral account, entitled the "PGR Application and Development Costs", to capture the costs of the Application and the costs of developing the PGR Project prior to approval of the Application. The Application costs will include expenses incurred by FEI for the development of the Application for filing, and the regulatory review process such as legal fees, BCUC costs, hearing costs and BCUC-approved intervener costs, a forecast of which is provided in the Application. The Project Development costs include expenses for Project management, engineering, and consultants for assessing the potential design and alternatives.

The Application and Development costs are recorded in the proposed non-rate base deferral account on a net-of-tax basis until January 31, 2020 attracting FEI's weighted average cost of capital (WACC) and will be transferred to rate base on January 1, 2021 with a three-year amortization period. The balance of the Application and Development Costs deferral account is \$2.85 million.

This request will be set out in more detail in Section 6 of the Application, which FEI will file in an evidentiary update.

1.4 PROPOSED REGULATORY PROCESS

As explained in Section 1.1, in order to maintain Project schedule requirements, FEI is proposing an accelerated regulatory review and approval process. FEI proposes that a round of IRs from the BCUC and interveners followed by a Streamline Review Process (SRP) will provide for an appropriate and efficient review of the Application. The SRP will provide an opportunity for follow up questions directly to FEI. The format of the SRP has proven effective in addressing a variety of applications, and FEI believes that it is well-suited for this Project.

If FEI has selected the Gagliardi Route as its preferred route and, therefore, is able to complete the Application in an evidentiary update at the end of September 2020, FEI proposes the regulatory timetable set out in Table 1-3 below.

Table 1-3: Proposed Regulatory Timetable

ACTION	DATE (2020)
BCUC Issues Procedural Order by	Friday, September 11
FEI Publishes Notice by	Friday, September 25
FEI files Evidentiary Update	Wednesday, September 30
Intervener Registration	Thursday, October 8
BCUC Information Request No. 1	Thursday, October 22
Intervener Information Request No. 1	Thursday, October 29
FEI Response to Information Requests No. 1	Thursday, November 19
Streamlined Review Process [subject to no need for a second evidentiary update]	Week of December 7
FEI Written Final Submission [subject to no need for a second evidentiary update]	Tuesday, December 22
ACTION	DATE (2021)
Intervener Written Final Submissions [subject to no need for a second evidentiary update]	Thursday, January 7
FEI Written Reply Submission [subject to no need for a second evidentiary update]	Thursday, January 21

If FEI is unable to complete the Application in its evidentiary update at the end of September because FEI is still analyzing the Sperling Route, FEI proposes that the first round of IRs proceed based on the information filed up to that time. In that case, in its September evidentiary update, FEI will indicate when it believes it can complete the Application and will propose an amendment to the regulatory schedule, which FEI anticipates would likely be in the form of an additional round of IRs on the second evidentiary update, and before the Streamlined Review Process.

In order to support an expedited regulatory review, FEI believes it has filed sufficient information in this Application to commence the regulatory review process, which will be supplemented by the evidentiary update(s). As noted in Section 1.1, in an evidentiary update FEI will include the following information:

- Section 4 Addendum: Alternatives Analysis. A description of the conclusion of FEI's consultation and negotiation with the City of Burnaby and analysis supporting FEI's preferred route for the Project.
- Section 5: Project Description. A detailed description of the Project, including project components, final route selection process, basis of design and engineering, construction, project schedule and resourcing requirements, as well as a qualitative risk assessment and analysis and contingency estimate;
- Section 6: Project Cost Estimate. A detailed description of the Project cost estimate, the assumptions upon which the financial analysis is based and the rate impacts.
- Section 7: Environmental and Archaeological Evaluation: A description of FEI's assessment of the potential environmental and archaeological impacts of the Project and the measures that will be taken to mitigate those potential impacts.
- Section 8: Consultation. A detailed description of FEI's public consultation and communication efforts regarding the Project and consultation with indigenous communities potentially impacted by the Project.

FEI respectfully requests a Decision from the BCUC as soon as practicable. FEI plans to initiate the detailed design and procurement for the first phases of the Project in the first quarter of 2021. FEI plans to begin construction of the new gas line in the second quarter of 2022 and is expecting to have all construction complete by the fourth quarter of 2022. Based on this timeline, the removal of the Pattullo Gas Line is expected to be complete by the third quarter of 2023.

1.5 ORGANIZATION OF THE APPLICATION

The Application provides detailed information in support of the approvals sought. The remainder of the Application is organized into the following sections:

- Section 2 provides an overview of the Applicant, and provides information on FEI's financial and technical capabilities to undertake the Project;
- Section 3 describes the need and justification for the Project;
- Section 4 describes the alternatives considered, the criteria for evaluating potentially feasible alternatives, and details the technical and financial evaluation of each of the these alternatives;
- Section 5 (to be included as evidentiary update) will provide a detailed description of the Project, including project components, final route evaluation and selection process, basis of design and engineering, construction, project schedule and resourcing requirements, as well as a qualitative risk assessment and analysis and contingency estimate;

- 1 • Section 6 (to be included as evidentiary update) will provide the cost estimate, the
2 assumptions upon which the financial analysis is based and the rate impacts;
- 3 • Section 7 (to be included as evidentiary update) provides an overview of the Project
4 environment, including a discussion of the environmental and archaeological impacts the
5 Project may have and FEI's plans to mitigate those impacts;
- 6 • Section 8 (to be included as evidentiary update) will discuss FEI's public consultation
7 and communication efforts regarding the Project and FEI's consultation with Indigenous
8 communities potentially impacted by the Project;
- 9 • Section 9 describes how the Project supports BC's energy objectives and its inclusion
10 within FEI's most recent long-term resource plan; and
- 11 • Section 10 concludes this Application.

2. APPLICANT

2.1 NAME, ADDRESS AND NATURE OF BUSINESS

FEI is a company incorporated under the laws of the Province of British Columbia and is a wholly-owned subsidiary of FortisBC Holdings Inc., which in turn is a wholly-owned subsidiary of Fortis Inc. FEI maintains an office and place of business at 16705 Fraser Highway, Surrey, British Columbia, V4N 0E8.

FEI is the largest natural gas distribution utility in British Columbia, providing sales and transportation services to residential, commercial, and industrial customers in more than 100 communities throughout British Columbia, with more than 1 million customers served throughout British Columbia. FEI's distribution network provides more than 95 percent of the natural gas energy delivered to customers in British Columbia.

2.2 FINANCIAL CAPACITY

FEI is regulated by the BCUC and is capable of financing the Project. FEI has credit ratings for senior unsecured debentures from Dominion Bond Rating Service Morningstar and Moody's Investors Service of A and A3, respectively.

2.3 TECHNICAL CAPACITY

FEI has designed and constructed a system of integrated high, intermediate and low-pressure pipelines, and operates approximately 50,000 kilometres of natural gas transmission and natural gas distribution mains and service lines in British Columbia. FEI has completed other large natural gas projects, and has the technical capacity to complete the Project.

2.4 COMPANY CONTACT

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3. PROJECT JUSTIFICATION

3.1 INTRODUCTION

The need to undertake the PGR Project arises from the Province's Pattullo Bridge Replacement Project, which includes the demolition of the Pattullo Bridge on which FEI's Pattullo Gas Line is affixed. The Pattullo Gas Line, which has been in operation since 1956, is integral to FEI's ability to supply natural gas to customers in Burnaby, New Westminister, and Coquitlam, and also provides resiliency benefits to FEI's Metro Vancouver natural gas system. FEI must, however, decommission the Pattullo Gas Line by the end of 2023 in advance of the scheduled demolition of the Pattullo Bridge. Therefore, in order to continue to deliver natural gas to existing customers in the cities of Burnaby, New Westminister and Coquitlam, the PGR Project is needed to replace the system capacity currently provided by the Pattullo Gas Line prior to its decommissioning.

The remainder of this section will provide details of the Project need and justification, as follows:

- Section 3.2 describes the Pattullo Gas Line and its location in relation to FEI's Metro Vancouver natural gas system;
- Section 3.3 describes the capacity and resiliency benefits of the Pattullo Gas Line;
- Section 3.4 describes the Province's Pattullo Bridge Replacement Project, including the timing of the demolition of the existing Pattullo Bridge which drives the need and required in-service date of the Project;
- Section 3.5 explains the need to replace the system capacity of the Pattullo Gas Line to continue to provide safe and reliable service to its customers; and
- Section 3.6 explains the need to replace the system resiliency benefits of the Pattullo Gas Line, which FEI has determined cannot be achieved by this Project.

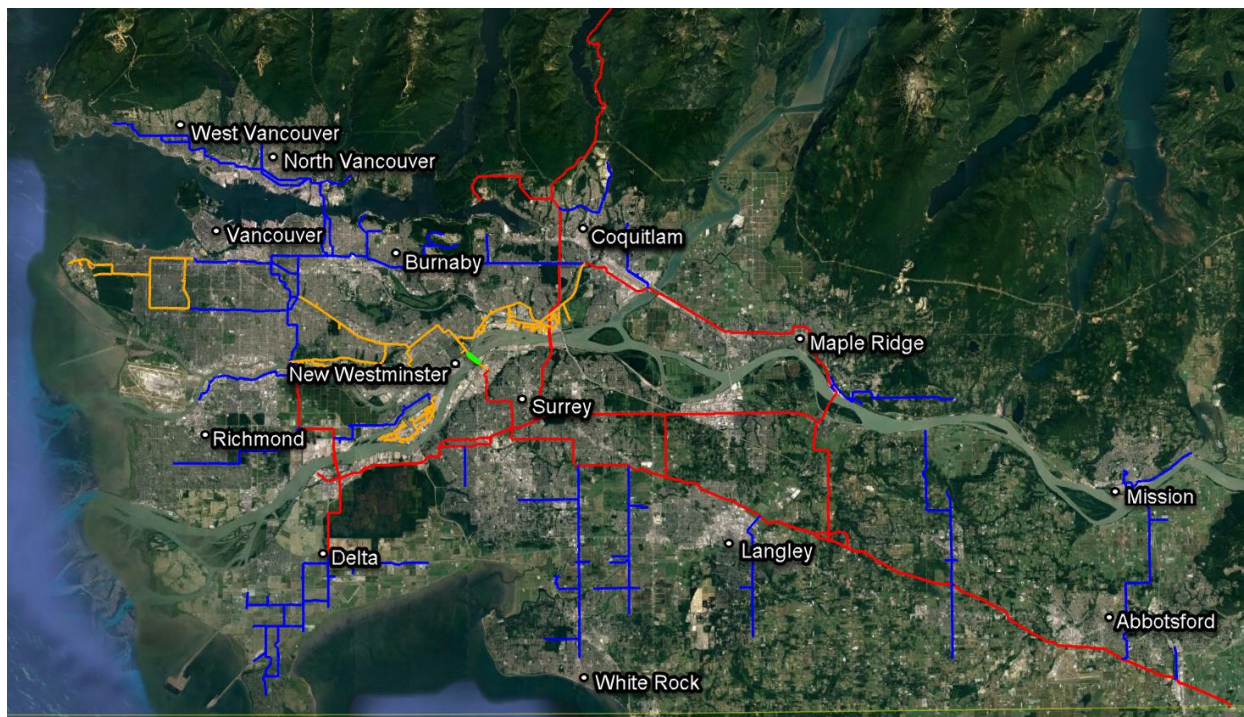
3.2 DESCRIPTION AND LOCATION OF THE PATTULLO GAS LINE

The Pattullo Gas Line is a nominal pipe size (NPS) 20 (508 mm outside diameter) distribution pressure (DP)² gas line affixed to the underside of the Pattullo Bridge, which spans the Fraser River from the City of Surrey to the City of New Westminister. FEI has operated the Pattullo Gas Line safely since its installation in 1956.

Figure 3-1 shows the Pattullo Gas Line (in green) in relation to FEI's Coastal Transmission System (CTS) and adjoining distribution system. The gas lines operating at transmission pressure (TP), which are shown in red, constitute the CTS.

² Distribution Pressure (≤ 700 kPa).

Figure 3-1: Overview of FEI's CTS and Distribution System



Source: FEI data overlaid on Google Earth mapping

- TP gas lines operating at greater than 2069 kPa
- IP gas lines operating between 701 kPa and 2069 kPa
- DP gas lines operating at less than or equal to 700 kPa
- Pattullo gas line operating at less than or equal to 700 kPa

The TP gas lines transport gas from the FEI Huntingdon Station near Abbotsford into the Fraser Valley and Metro Vancouver areas to feed gate stations³ located within various communities in the Lower Mainland. The IP gas lines transport the natural gas supply from the gate stations in a bi-directional corridor to numerous district stations, which in turn feed the DP system that serves customers in Metro Vancouver. Within this system, the Pattullo Gas Line is an integral component of FEI's Metro Vancouver IP and DP distribution system due to the system capacity and resiliency benefits it provides, as described in the following section.

³ A gate station is a station that regulates the pressure of the gas stream prior to it entering a distribution system operating at a lower pressure and the gas usually requires preheating.

3.3 SIGNIFICANCE OF THE PATTULLO GAS LINE TO THE METRO VANCOUVER DISTRIBUTION SYSTEM

Although it is relatively short in length (as shown in Figure 3-1), the Pattullo Gas Line is a critical link in the gas supply to thousands of downstream customers. Specifically, it provides two key benefits:

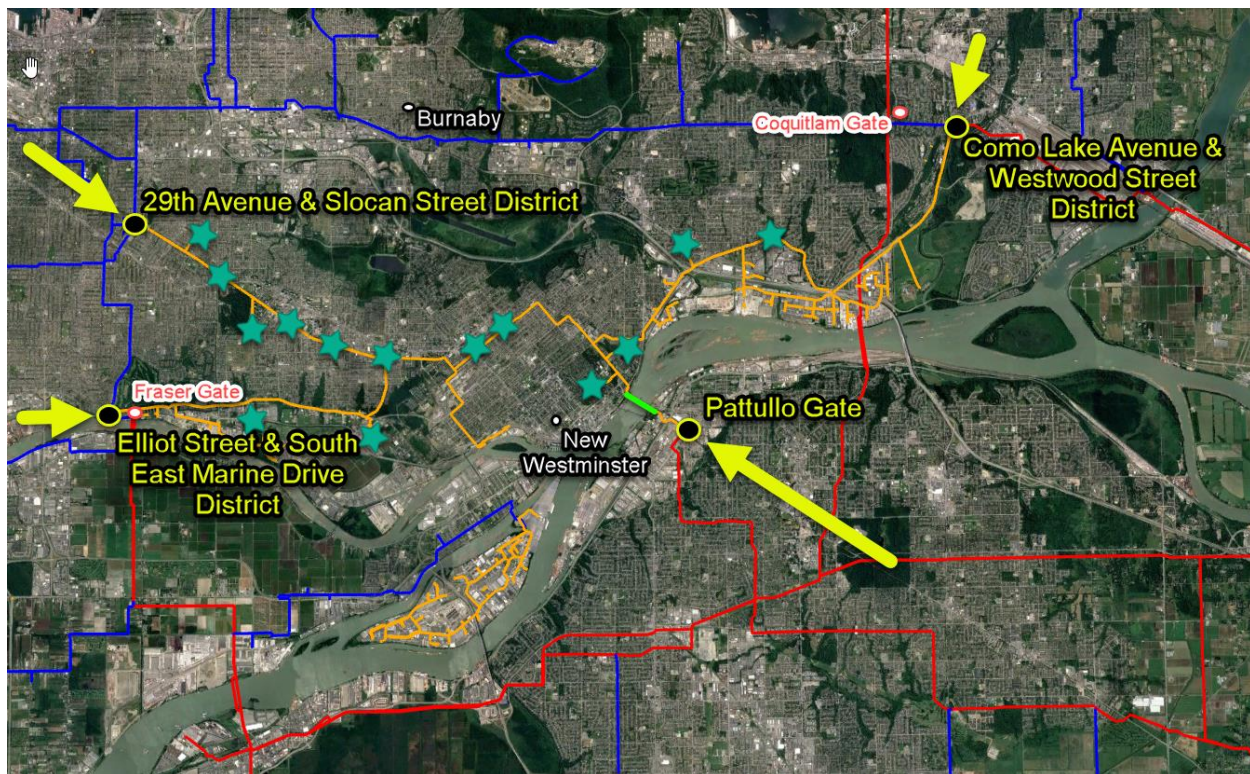
1. Distribution system capacity to supply natural gas to customers in Burnaby, New Westminister and Coquitlam; and
2. Resiliency to FEI's larger Metro Vancouver area.

3.3.1 Capacity to Serve Customers in Burnaby, New Westminister and Coquitlam

Today, the Pattullo Gas Line supplies all or a portion of natural gas to approximately 35,000 customers in Burnaby, New Westminister and Coquitlam.

The Pattullo Gas Line provides capacity to serve customers through the 700 kPa trunk distribution system, depicted in orange in Figure 3-2 below. This trunk distribution system is a subset of Metro Vancouver's distribution system spanning from the south east portion of Vancouver, from Elliott Street and South East Marine Drive (near Fraser Gate) to Como Lake Avenue and Westwood Street in Coquitlam (near Coquitlam Gate). The 700 kPa trunk distribution system supplies 14 regulating district stations, represented by the green stars in Figure 3-2, which feed gas into the 420 kPa distribution system that directly supplies residential, commercial and industrial customers.

Figure 3-2: Stations Supplying the Metro Vancouver 700 kPa Trunk Distribution System



As seen in the figure above, the trunk distribution system is fed at four points:

1. Pattullo Gate Station (via the Pattullo Gas Line);
2. Como Lake Avenue and Westwood Street District Station (fed by Coquitlam Gate);
3. Elliott Street and South East Marine Drive District Station (fed by Fraser Gate); and
4. 29th Avenue and Slocan Street District Station.

The length of the yellow arrows in the figure above represent the proportion of gas supplied from each station. As shown, the Pattullo Gas Line represents the largest and most significant feed into the 700 kPa trunk distribution system. In cold winter weather, the Pattullo Gas Line supplies over half of the gas entering the 700 kPa trunk distribution system.

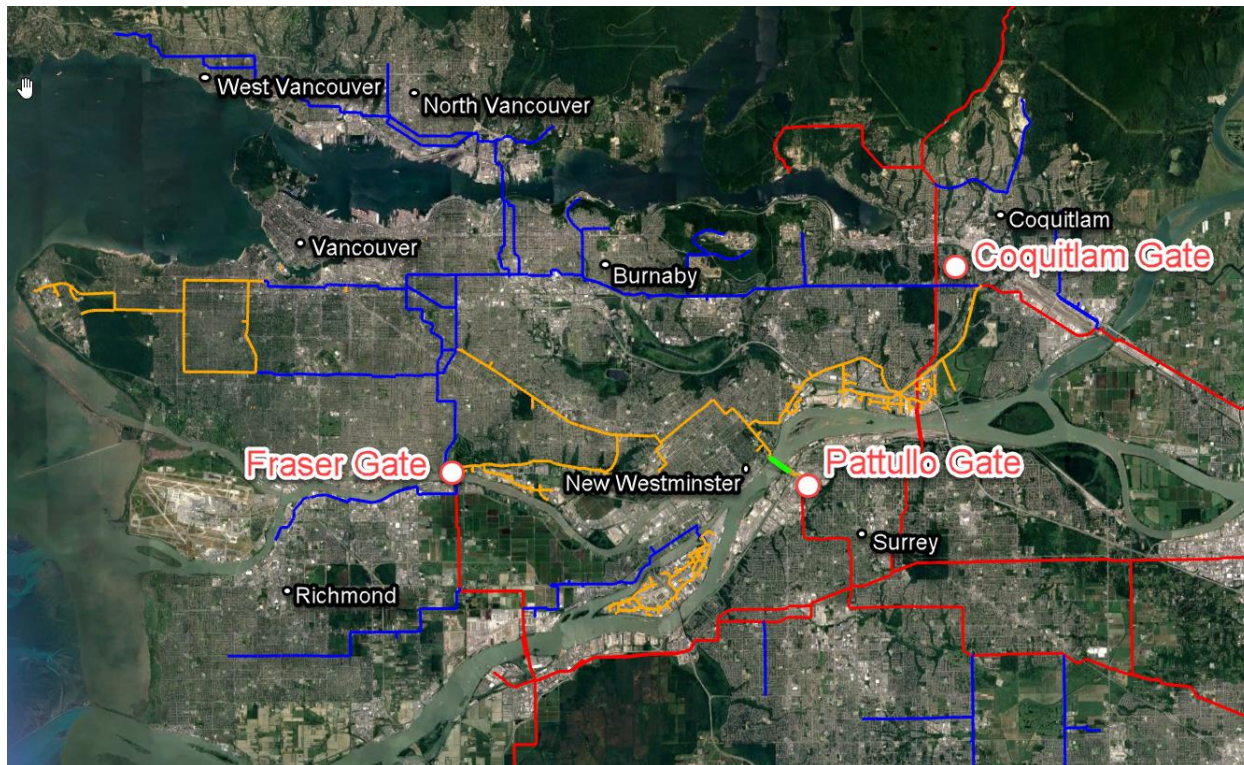
The capacity benefits of the Pattullo Gas Line are discussed further in Section 3.3.

3.3.2 Resiliency for Metro Vancouver Distribution System

The Pattullo Gas Line also provides resiliency benefits to FEI's Metro Vancouver distribution system. As shown in Figure 3-3 below, the CTS supplies natural gas to the Metro Vancouver distribution system primarily through three gate stations:

1. Fraser Gate, located on East Kent Ave South near Kerr Street in Vancouver;
2. Coquitlam Gate, located on Spuraway Avenue near Mariner Way in Coquitlam; and
3. Pattullo Gate, located on 120th Street near Old Yale Road in Surrey.

Figure 3-3: Gate Stations Feeding FEI's Metro Vancouver Distribution System



The three gate stations shown in the figure above are independent feeds into the interconnected distribution system. Coquitlam Gate supplies the majority of gas required to serve customers in FEI's larger Metro Vancouver area, with Fraser Gate and Pattullo Gate (via the Pattullo Gas Line) contributing the remainder of the gas supply. Together, the three gate stations provide the capacity to support the vast majority of customers served by the Metro Vancouver distribution system.

With the recent system improvements completed as part of the Lower Mainland IP System Upgrade (LMIPSU) Project⁴, the Metro Vancouver distribution system is fully supported under peak day conditions if either Coquitlam Gate or Fraser Gate is out of service due to an unanticipated station failure or the failure of an upstream gas line supplying the station. However, the resiliency of the Metro Vancouver distribution system relies on the independent third feed from the Pattullo Gate station (through the Pattullo Gas Line) to support the 700 kPa trunk distribution system. The third feed from the existing Pattullo Gas Line leaves capability in

⁴ BCUC Decision and Order C-11-15, dated October 16, 2015. Online: https://www.bcuc.com/Documents/Proceedings/2015/DOC_44883_10-16-2015_FEI-LMIPSU-CPCN-Decision.pdf

the Coquitlam and Fraser gate stations to compensate if supply from either is lost. This resiliency allows for flexibility in the operation of the distribution system and allows FEI to maintain reliable supply to its customers. The resiliency benefits of the Pattullo Gas Line and the impacts of PGR Project on FEI's system resiliency are discussed further in Section 3.6 and Section 4.4.2 of the Application.

3.4 PATTULLO BRIDGE REPLACEMENT PROJECT

FEI will lose the Pattullo Gas Line, and the benefits it provides, due to the Province's Pattullo Bridge Replacement Project, which includes the demolition of the Pattullo Bridge on which FEI's Pattullo Gas Line is affixed. The Pattullo Bridge Replacement Project has received an Environmental Assessment Certificate from the B.C. Environmental Assessment Office (EAO) under British Columbia's Environmental Assessment Act, as well as a Project and Environmental Review Project Permit from the Vancouver Fraser Port Authority. At the time of filing this Application, the Pattullo Bridge Replacement Project is in the design and construction phase.

The New Bridge is scheduled to open in fall 2023. The existing bridge will remain in use until the New Bridge is open to traffic. Once the New Bridge is open, the existing bridge will be removed.⁵

Based on the current Project schedule, demolition of the Pattullo Bridge is scheduled to proceed by the end of 2023 after the New Bridge opens. However, MoTI has indicated that it could occur earlier than this target date due to the nature of the performance based, design-build-finance contract it has entered into with its contractor who will be performing the construction and demolition work.

Prior to the demolition of the existing Pattullo Bridge, FEI will need to degasify and purge the existing Pattullo Gas Line to make it safe for removal, and abandon and/or remove all associated infrastructure, as well as complete any required modifications to the existing infrastructure upstream and downstream of the Pattullo Gas Line.

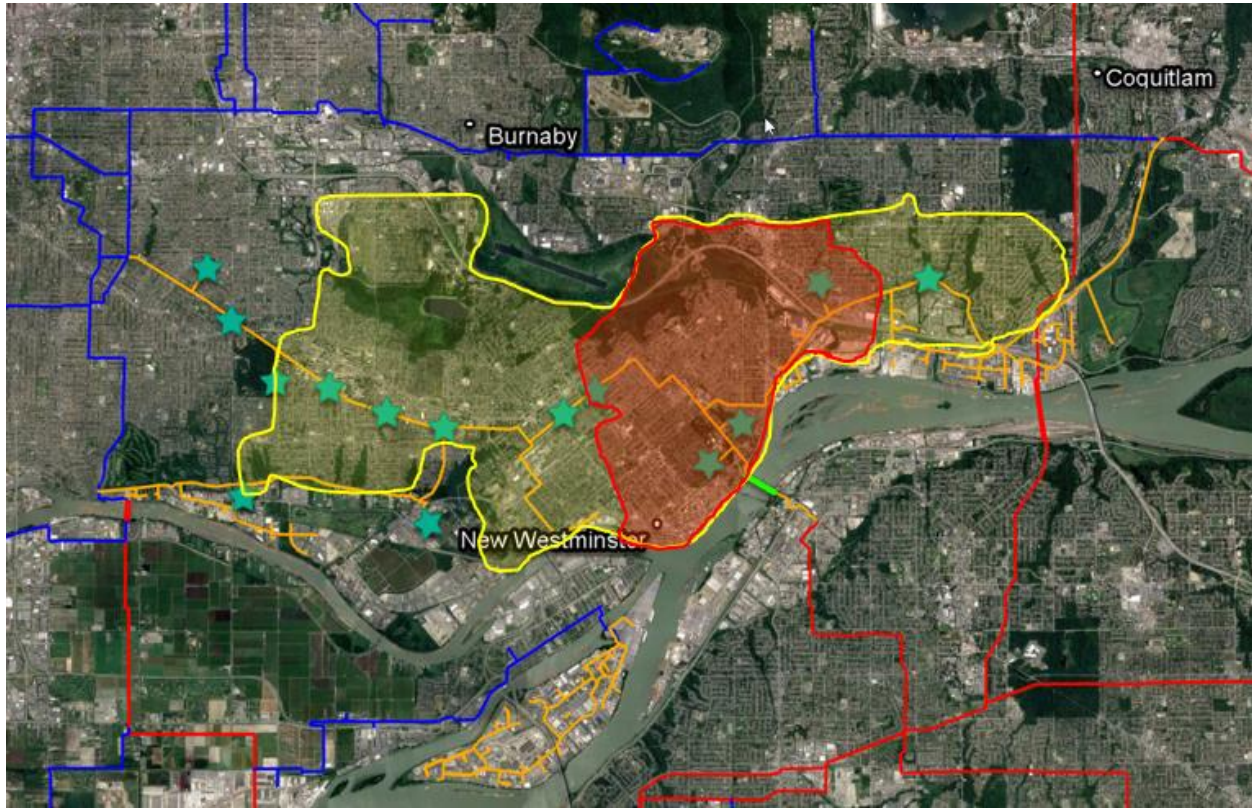
3.5 FEI MUST REPLACE THE DISTRIBUTION SYSTEM CAPACITY PROVIDED BY THE PATTULLO GAS LINE

Prior to the decommissioning of the Pattullo Gas Line, FEI must replace the distribution system capacity currently provided by the Pattullo Gas Line in order to continue to supply natural gas safely and reliably to customers in Burnaby, New Westminster and Coquitlam. The Pattullo Gas

⁵ The Government of B.C.'s website for the Pattullo Bridge Replacement Project (<https://engage.gov.bc.ca/pattullobridge/>) provides details on the project. Transportation Investment Corporation, a provincial Crown corporation, is delivering and overseeing the project, and Fraser Crossing Partners has been awarded the contract to design and build the New Bridge. The Province will own and maintain the New Bridge when complete.

Line currently supplies all or a portion of natural gas to approximately 35,000 customers in these cities. The area where these customers are located is outlined in yellow in Figure 3-4 below.

Figure 3-4: 10,700 Customers Impacted by Loss of Pattullo Gas Line Feed in 2020



Without the Pattullo Gas Line, the area shaded in red in Figure 3-4 would have inadequate gas supply. This represents the distribution area supplied by one regulating district station in southwest Coquitlam and two regulating district stations in New Westminster, all of which are fed from the 700 kPa trunk distribution system. Based on FEI's 2020 peak demand projection⁶, during the coldest days of the year when peak demand occurs, and without support from the Pattullo Gas Line, these district stations would have inadequate inlet pressure leading to a loss of gas supply. This includes approximately 2,100 customers in Burnaby, 2,800 customers in New Westminster, and 5,800 customers in Coquitlam. This represents a disruption in service to approximately 10,700 residential, commercial, and industrial customers who rely on natural gas to provide necessary heat and hot water for their homes and businesses.

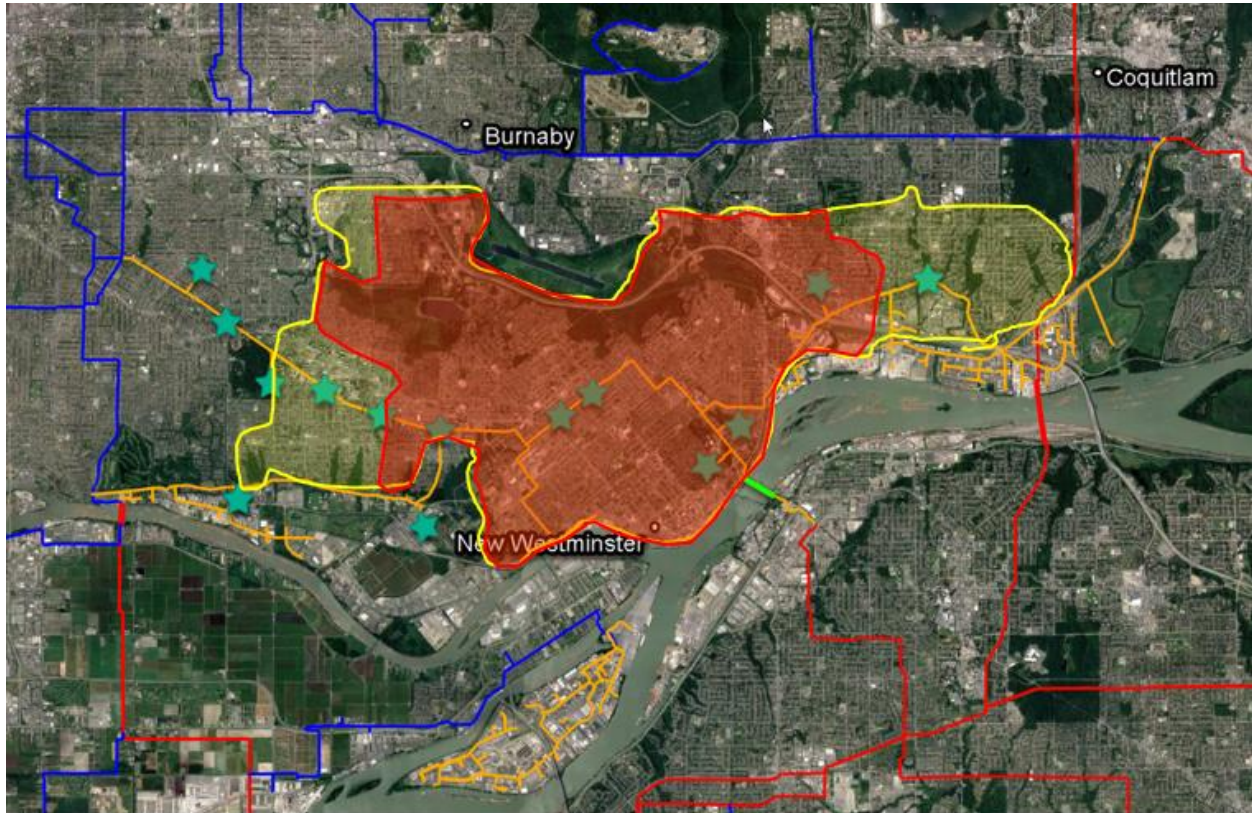
Based on 2020 customer peak demand projections, the customers in the area shaded in yellow (and outside the red region) in Figure 3-4 above could continue to receive service without the Pattullo Gas Line. This is because of the relative proximity of the customers in the yellow-shaded area to either Fraser Gate or Coquitlam Gate and the capacity of these Gate stations to

⁶ Peak demand conditions occur in cold winter when consumer space heating demands are highest. To design reliable distribution systems FEI projects system peak demand based on coldest weather conditions likely to occur 1 in 20 years.

accept some of the load currently provided by the Pattullo Gas Line. This illustrates the resiliency of the current system.

However, without replacement of the Pattullo Gas Line, the impacted area in red would expand as customer load grows over time. Based on FEI's 20-year forecast, by 2039 an additional 14,800 customers (for a total of approximately 25,500 customers) would be without gas during cold winter periods. This is illustrated in Figure 3-5 below.

Figure 3-5: 25,500 Customers Impacted by Loss of Pattullo Gas Line Feed in 2039



In summary, FEI must replace the distribution system capacity of the Pattullo Gas Line prior to its decommissioning in 2023 to continue safe and reliable natural gas supply to existing customers. While the number of customers that would be left without safe and reliable service would grow over time, the need to replace the distribution system capacity of the Pattullo Gas Line is not driven by load growth or an increase in customers' peak demand. Rather, even based on current (2020) customer loads, 10,700 customers would be left without safe and reliable service. Thus, any variation from FEI's load forecast in the area, including any sustained impacts of the COVID-19 pandemic, would not impact the need for the Project. In short, in order to continue providing natural gas service safely and reliably to customers in Burnaby, New Westminster and Coquitlam, FEI must replace the distribution system capacity currently provided by the Pattullo Gas Line prior to its decommissioning in 2023.

3.6 *IMPACTS OF THE PGR PROJECT ON FEI'S METRO VANCOUVER DISTRIBUTION SYSTEM RESILIENCY*

As discussed in Section 3.3.2, the resiliency benefits of the Pattullo Gas Line allow for the full capacity of the Metro Vancouver distribution system to be maintained should Coquitlam Gate or Fraser Gate station be unable to supply gas into the distribution system. If the Pattullo Gas Line is removed without replacement, and if the gas supply from either Coquitlam Gate or Fraser Gate station is lost, the sole remaining gate station would need to compensate for both the loss of the Pattullo Gas Line supply and the failed gate station. Under this scenario, the resiliency of the system is eroded and there is insufficient capacity to support the lost station. This represents a loss of resiliency, as the remaining gate station could only support customers in warmer weather when system demand is lower.

As explained in detail in Section 4, FEI examined a number of alternatives for the PGR Project that would replace both the capacity and resiliency benefits currently provided by the Pattullo Gas Line. However, FEI determined that there is no feasible project alternative that would replace the system resiliency currently provided by the Pattullo Gas Line and meet the schedule requirements of the Project. This is further discussed in Section 4.4.2.

3.7 *CONCLUSION ON PROJECT NEED AND JUSTIFICATION*

FEI must undertake the PGR Project due to the Province's Pattullo Bridge Replacement Project, which requires FEI to decommission the Pattullo Gas Line in 2023. The Pattullo Gas Line provides vital capacity and system resiliency benefits to the Metro Vancouver distribution system. If the Pattullo Gas Line is not replaced, it will result in the loss of safe and reliable gas supply to thousands of customers in Burnaby, New Westminster and Coquitlam.

Therefore, the PGR Project is required and needs to meet following objectives:

1. Replace the distribution system capacity currently provided by the Pattullo Gas Line to maintain the safe and reliable supply of natural gas to customers; and
2. Complete the PGR Project in advance of the scheduled Pattullo Bridge demolition to ensure continued gas supply to its customers.

A desirable secondary objective would be to also replace the resiliency benefits provided by the existing Pattullo Gas Line. However, as discussed above, FEI has determined that it cannot replace the distribution system resiliency benefits of the Pattullo Gas Line at this time. Therefore, another project or system improvements will be undertaken to restore the Metro Vancouver system resiliency at a later date.

4. ALTERNATIVES EVALUATION

4.1 INTRODUCTION

FEI evaluated numerous alternatives for the PGR Project to identify a solution that meets the Project objectives and has the least impact in terms of technical design, scope, complexity, cost, construction, environmental, archaeological and societal impacts, along with consideration of impacts to FEI's existing system capacity and resiliency.

FEI initially pursued alternatives that would have the least impact and would replace both the capacity and resiliency benefits of the Pattullo Gas Line. The obvious least overall impact solution would be to attach a replacement gas line to the New Bridge. FEI pursued the installation of a gas line on the New Bridge, which MoTI would not approve, and investigated a trenchless crossing of the Fraser River, which was found to be not feasible. FEI then considered various other alternatives to meet the project need, including through Richmond and across the Fraser River, an aerial crossing near the site of the Pattullo Bridge, a peak shaving facility or virtual pipeline, and overland gas line routes. Ultimately, FEI determined that an overland gas line routed through the City of Burnaby had the least impact, and would be the only solution available that can be implemented prior to the time when FEI must decommission the Pattullo Gas Line. FEI's consultation and negotiations with the City of Burnaby regarding the route for the Project are ongoing at the time of filing this Application.

The remainder of this section will provide details of the Project alternatives analysis and organized as follows:

- Section 4.2 provides an overview of the alternatives analysis, including the timeline of FEI's analysis.
- Section 4.3 describes FEI's analysis of the alternatives that were determined to be not feasible.
- Section 4.4 describes the overland gas line route options for the Project, and FEI's analysis of the route options based on financial and non-financial criteria. This section also describes FEI's ongoing consultation and negotiations with the City of Burnaby regarding a route for the Project.

4.2 OVERVIEW OF ALTERNATIVES ANALYSIS

The alternatives and sub-alternatives FEI identified and evaluated are listed in Table 4-1 below, and described in detail in Sections 4.3 and 4.4.

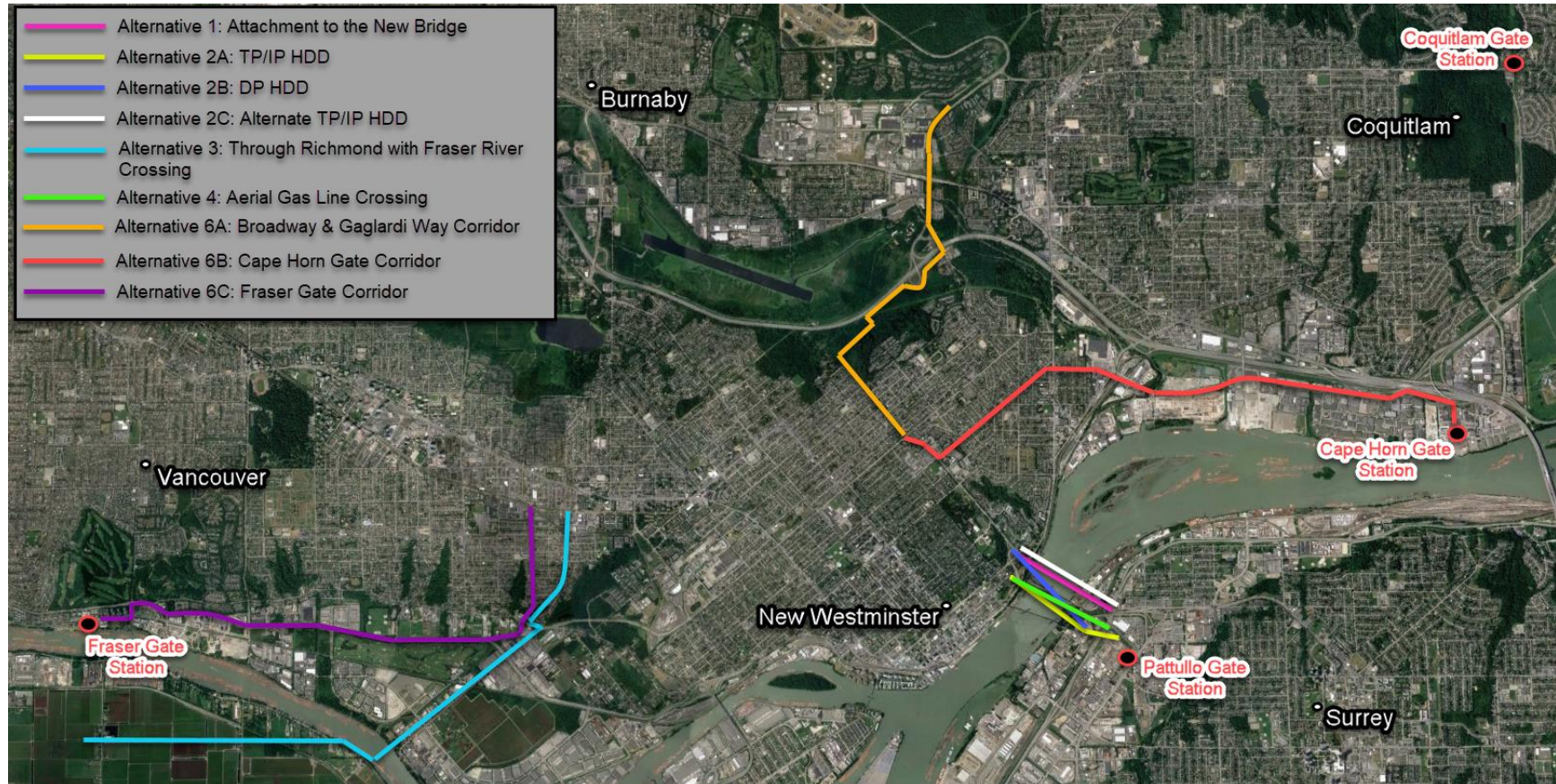
1 **Table 4-1: Alternatives and Sub-Alternatives Considered for PGR Project**

Alternatives and Sub-Alternatives Considered	
Alternative 1	Attachment to the New Bridge
Alternative 2	Trenchless Crossing of the Fraser River <ul style="list-style-type: none"> • Alternative 2A - High Pressure Horizontal Directional Drill (TP/IP HDD) • Alternative 2B - Distribution Pressure Horizontal Directional Drill (DP HDD) • Alternative 2C - Alternate High Pressure Horizontal Directional Drill (TP/IP) • Alternative 2D - Other Trenchless Methodologies (Micro-tunneling)
Alternative 3	Through Richmond with Fraser River Crossing <ul style="list-style-type: none"> • Alternative 3A - TP Gas Line with 1 Gate Station • Alternative 3B - IP Gas Line with 1 Gate Station and 1 District Station
Alternative 4	Aerial Gas Line Crossing
Alternative 5	Peak Shaving Facility / Virtual Gas Line <ul style="list-style-type: none"> • Alternative 5A - Liquefied Natural Gas (LNG) • Alternative 5B - Compressed Natural Gas (CNG)
Alternative 6	Overland Gas Line <ul style="list-style-type: none"> • Alternative 6A - Broadway and Gagliardi Way Corridor • Alternative 6B - Cape Horn Gate Corridor • Alternative 6C - Fraser Gate Corridor • Alternative 6D – Sperling Avenue Corridor

2
3 These alternatives are shown in Figure 4-1 below. Alternative 5 is not shown as locations for a
4 peak shaving facility and injection sites associated with a virtual gas line were never identified.

1

Figure 4-1: Map of PGR Project Alternatives



2

3

FEI conducted a comprehensive evaluation of these alternatives with a focus and priority on the solutions with the least impact.

Given that it would be the most straightforward and overall least impact solution, FEI first pursued a like-for-like replacement with Alternative 1 via an installation of the replacement Pattullo Gas Line on the New Bridge. FEI diligently pursued this alternative with multiple requests to MoTI, complete with supporting documentation, from the time it first received written notice in June 2017 to move the Pattullo Gas Line or cease transmission of gas. FEI pursued this alternative while simultaneously evaluating other alternatives until it received final verbal confirmation from MoTI in January 2020 that the installation of FEI's gas line on the New Bridge would not be allowed. Section 4.3.1 below explains the reasons why MoTI denied FEI's requests. While FEI considered that the new replacement gas line could be designed for safe and reliable long-term operations with no material safety impacts to the New Bridge or its users, without agreement from MOTI's chief engineer to allow the attachment, this alternative is not feasible.

The next alternative evaluated was Alternative 2, a trenchless crossing of the Fraser River. FEI began to pursue this alternative in September 2018 after receipt of MoTI's initial response in July 2018 denying FEI's request to install a gas line on the New Bridge. As explained in Section 4.3.2, after conducting preliminary designs, FEI engaged a drilling contractor using an early contractor involvement project delivery method to evaluate the constructability and feasibility of this alternative. However, FEI and the drilling contractor concluded in August 2019 that the drill options were not feasible due to constructability issues and the high likelihood of hydraulic failures that could lead to a frac-out⁷ in the Fraser River.

After determining that Alternative 2 was not feasible, FEI proceeded to analyse all other alternatives beginning in August 2019. These remaining alternatives would not be like-for-like replacements, and would not be able to replace the resiliency benefits currently provided by the Pattullo Gas Line.

FEI screened out Alternatives 3, 4 and 5 as they could not meet the Project objectives as further explained in Sections 4.3.3 through 4.3.5.

The only remaining potentially feasible alternative was Alternative 6: Overland Gas Line. FEI analysed and evaluated the route options for this alternative based on the evaluation criteria specified in Section 4.4.2, which included choosing a cost effective feasible solution that minimizes impacts to the project schedule, environment and the public and Indigenous communities. Out of the three Overland Gas Line alternatives originally evaluated (i.e Alternatives 6A, 6B and 6C), Alternative 6A - Broadway & Gagliardi Way Corridor has the shortest schedule duration, least community impacts, and lowest financial impact based on AACE Class 5 conceptual cost estimates. FEI began consulting with the City of Burnaby on the route for the Project in February 2020 and its consultation and negotiations continue at the time

⁷ Frac-out is defined as the uncontrolled release of drilling fluid through fractured bedrock or flows into the rock and sand that surrounds the bedrock and travels toward the surface.

of filing this Application, including investigation of an alternative route in the City of Burnaby (Sperling Route). Details regarding the evaluation of the Overland Gas Line alternatives are provided in Section 4.4.

The remainder of Section 4 describes in further detail FEI's analysis of alternatives determined to be not feasible, and the analysis of the Overland Gas Line alternative based on financial and non-financial evaluation criteria, as well as FEI's ongoing consultation and negotiations with the City of Burnaby.

4.3 ALTERNATIVES INVESTIGATED BUT DEEMED NOT FEASIBLE

FEI evaluated a number of alternatives to meet the Project's objectives and requirements that were ultimately determined to be not feasible. A summary of the assessment for each of the alternatives considered is provided in Table 4-2 below, with the reasons described in detail in the sections below.

Table 4-2: Assessment Summary of PGR Project Alternatives

Alternatives Considered	Feasibility	Evaluation of Alternatives
1. Attachment to the New Bridge	Not Feasible	
2. Trenchless Crossing of the Fraser River (Alternatives 2A, 2B, 2C and 2D)	Not Feasible	
3. Through Richmond with Fraser River Crossing (Alternatives 3A, 3B and 3C)	Not Feasible	
4. Aerial Gas Line Crossing	Not Feasible	
5. Peak Shaving / Virtual Gas Line (Alternatives 5A and 5B)	Not Feasible	
6. Overland Gas Line (Alternatives 6A, 6B, 6C and 6D)	Potentially Feasible	Evaluation Ongoing ⁸

4.3.1 Alternative 1 - Attachment to the New Bridge Not Feasible Based on MoTI's Refusal to Permit

This alternative involves the installation of an NPS 20 (508 mm OD) DP gas line on the underside of the New Bridge similar to the current gas line on the Pattullo Bridge. As shown in Figure 4-2 below, on the south side of the bridge, the gas line would tie into the NPS 20 DP gas line near Highway 17 (South Fraser Perimeter Road) in the City of Surrey. On the north side of

⁸ As explained in Section 4.4, Alternative 6A was found to be superior to Alternatives 6B and 6C, which would not meet Project schedule requirements and were therefore considered to be not feasible. Furthermore, FEI's investigation of the Alternative 6D continues at the time of filing this Application.

the Bridge, the gas line would tie into the NPS 20 DP gas line on McBride Boulevard in the City of New Westminster.

Figure 4-2: Map of Attachment to the New Bridge Alternative



4.3.1.1 Analysis of Alternative 1

FEI pursued Alternative 1 - Attachment to the New Bridge, through multiple submissions to TransLink and MoTI in an effort to obtain approval to install a natural gas line on the New Bridge.

In a letter dated July 3, 2018 MoTI communicated its decision to not allow FEI to install a replacement natural gas line on the New Bridge. The rationale provided was as follows:⁹

1. MoTI's Utility Policy Manual notes that while DP and IP natural pipelines can sometimes be accommodated on provincial bridges, such pipelines are only considered when other crossing alternates are not feasible or if the alternate approaches result in environmental risk or other sensitivities. Fortis has developed potential alternate solutions.
2. MoTI's policies of restricting natural gas pipelines on bridges are in line with other North American jurisdictions, where such installations are highly discouraged and only allowed as a last resort when no other feasible crossing alternative exists.
3. The New Bridge will be designed as a lifeline structure with the highest standard of seismic design, requiring the New Bridge to be usable by traffic after a seismic event for both emergency response and economic recovery. The bridge is a key link between communities. The presence of a natural gas pipeline represents a significant risk to the

⁹ The letter from MoTI to FEI, dated July 3, 2018 is attached as Appendix A-1 to the Application.

1 reliability of the structure post a major seismic event that impacts the Greater Vancouver
2 region.

3
4 In a letter dated September 28, 2018 (see Appendix A-2), FEI responded to MoTI to emphasize
5 the following:

- 6 1. The gas line on the New Bridge will be designed to the same seismic design
7 requirements as that of the bridge (1:2475);
- 8 2. FortisBC will be responsible for all the costs related to the installation and subsequent
9 maintenance of the gas line on the New Bridge; and
- 10 3. Remote controlled valves, similar to ones installed on a number of gas lines in the Lower
11 mainland, will be installed in the line at both ends of the New Bridge. These valves could
12 be closed when an event that could affect the integrity of the lines is detected to ensure
13 gas does not flow through it.

14
15 In a subsequent letter from MoTI to FEI dated October 30, 2018 (see Appendix A-3), MoTI
16 reaffirmed its initial position, stating:

17 The New Bridge will be designed as a lifeline structure and will be a vital link
18 between communities should there be a significant seismic event. The ongoing
19 integrity of the bridge will be key to facilitating an effective response and recovery
20 plan after such an event. Given this context, and the fact that there are other
21 options open to Fortis, MoTI does not intend to revisit the decision taken on this
22 matter.¹⁰

23 FEI believes that installing a replacement gas line on the New Bridge would have the least
24 impact, and therefore it continued to pursue this alternative with multiple attempts to meet with
25 MoTI's chief engineer to discuss the reasons as provided and to discuss any design
26 modifications to meet the new lifeline design criteria. MoTI verbally confirmed that its decision
27 was final in January 2020. Having exhausted all possibilities for approval by MoTI, FEI
28 concluded that this alternative was not feasible.

29 **4.3.2 Alternative 2 – Trenchless Crossing of the Fraser River Not Feasible** 30 **Based on Significant Construction Challenges**

31 FEI evaluated several options for a trenchless crossing of the Fraser River near the Pattullo
32 Bridge, including three horizontal directional drill (HDD) alignments and other trenchless
33 crossing methods. FEI engaged a drilling contractor as part of an early contractor involvement
34 project delivery method to further assess these alternatives. All of the proposed sub-
35 alternatives were identified as not being constructible and had other technical issues and risks
36 which could not be adequately addressed or cost effectively mitigated using risk mitigation
37 techniques. As a result, FEI determined that these alternatives were not feasible.

¹⁰ The letter from MoTI to FEI, dated October 30, 2018 is attached as Appendix A-3 to the Application.

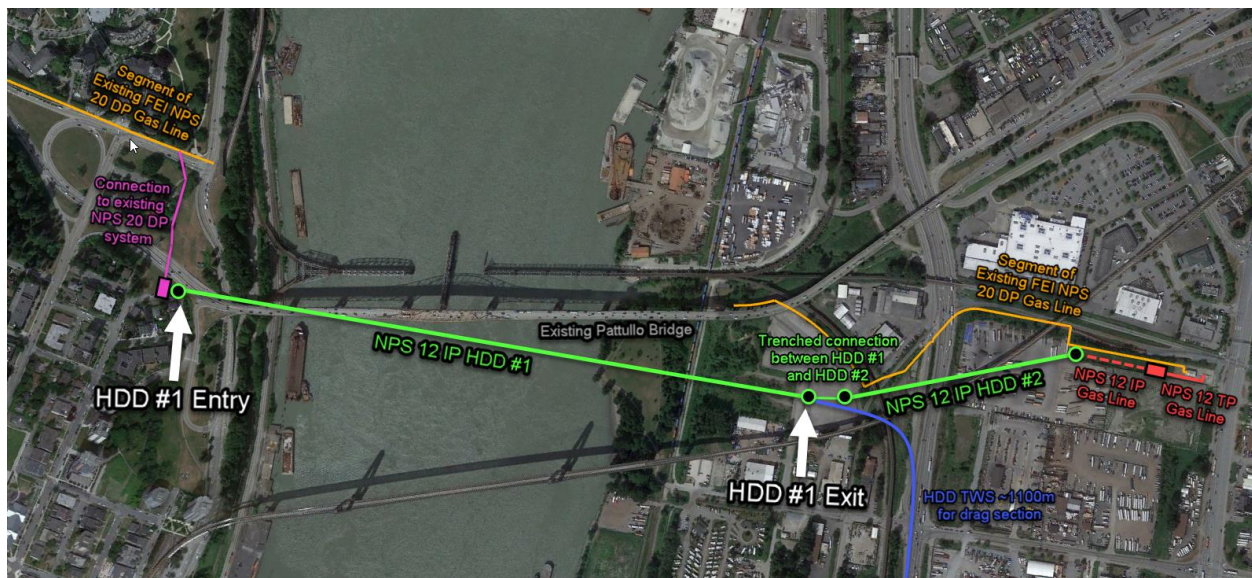
The description and analysis of these alternatives are provided below.

4.3.2.1 Alternative 2A – High Pressure HDD (TP/IP HDD)

This alternative involves the installation of an NPS 12 (323 mm) TP or IP gas line across the Fraser River via an HDD (#1) near the Pattullo Bridge. The drill entry point would be located in a grassed clearing immediately east of Dufferin Street in the City of New Westminster and would exit in a rail storage yard on the south side of the Fraser River in the City of Surrey. The new pipe would be strung and welded together along Highway 17 as shown in blue in Figure 4-3 below. The length of the HDD would be approximately 1,063 meters. The drill path would cross under the existing Pattullo Bridge.

On the south end, the gas line would require additional onshore piping to connect to the existing Pattullo Gate Station via a shorter HDD (#2) approximately 391 meters under Highway 17 and the Burlington Northern Santa Fe (BNSF) Railway. On the north end, a new pressure regulating station would be required to reduce the gas pressure to 700 kPa and a new DP gas line would be required to tie into the NPS 20 DP gas line on McBride Boulevard, as shown in purple in Figure 4-3.

Figure 4-3: Map of High Pressure Horizontal Directional Drill (TP/IP HDD) Alternative



4.3.2.1.1 ANALYSIS OF ALTERNATIVE 2A

FEI determined this alternative with the TP/IP HDD alignment shown in Figure 4-3 above was not feasible due to the compounding impacts of the following challenges:

- The HDD alignment crosses below or beside piers of the Pattullo Bridge, which would likely destabilize the existing structure. Considering that the bridge structure must remain operational during the construction of the New Bridge, there is no cost effective risk mitigation that FEI could identify to safely address this issue;

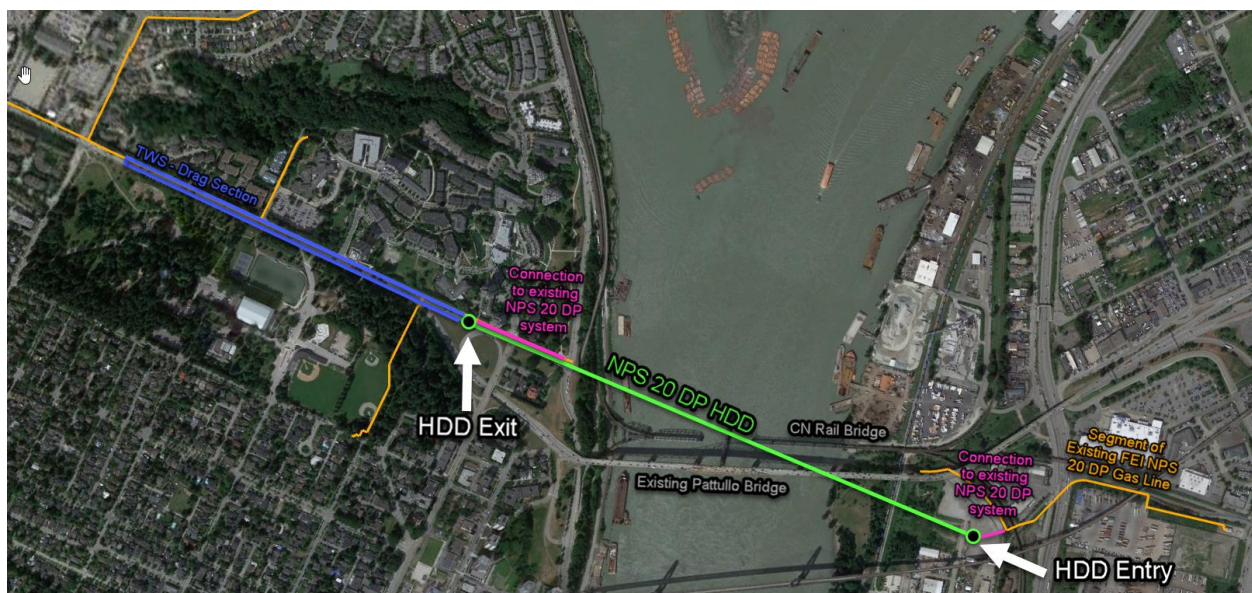
- There is an increased likelihood of a significant environmental event due to increased risk of frac-out causing an uncontrolled release of drilling fluid under the Fraser River due to:
 - elevation differences between entry and river bottom; and
 - soft soil conditions which cannot resist the drilling pressure;
- Limited workspace resulting in the likelihood of overstressing the pipe or damaging the pipe coating during construction and pullback; and
- Conflicts with Highway 17, SkyTrain tunnel and railroad crossings, creating potential for significant transportation system closures.

4.3.2.2 Alternative 2B – Distribution Pressure HDD (DP HDD)

This alternative involves the installation of an NPS 20 (508 mm) DP gas line across the Fraser River via an HDD near the Pattullo Bridge. The drill entry point would be located in a rail storage yard on the south side of the Fraser River in the City of Surrey and would exit on the east side of McBride Boulevard in the City of New Westminster. The new pipe would be strung and welded together along McBride Boulevard as shown in blue in Figure 4-4. The length of the HDD would be approximately 1,293 meters. The drill path (shown in green) would cross under the Pattullo Bridge, the New Bridge, and the Canadian National (CN) Rail bridge.

On the south end, the gas line would require additional onshore piping and would tie into the existing NPS 20 DP gas line near Highway 17, as shown in purple in Figure 4-4 below. On the north end, the gas line would tie into the existing NPS 20 DP gas line on McBride Boulevard between two existing block valves.

Figure 4-4: Map of Distribution Pressure Horizontal Directional Drill (DP HDD) Alternative



4.3.2.2.1 ANALYSIS OF ALTERNATIVE 2B

FEI determined the DP HDD alignment shown in Figure 4-4 above was not feasible due to the compounding impacts of the following issues and risks:

- The HDD alignment crosses below and beside piers of the CN Rail bridge which has the potential to destabilize the structure. There is no cost effective risk mitigation strategy that FEI could identify to safely address this issue and keep the bridge operational. CN Rail will not grant a crossing permit to FEI, which is required for execution of this alternative;
- Increased likelihood of a significant environmental event due to increased risk of frac-out causing an uncontrolled release of drilling fluid under the Fraser River;
- Significant traffic disruption during pipeline string out construction and testing on McBride Boulevard, precipitating lane closures for several months; and
- The proposed HDD entry location is in conflict with the future development plans by the property owner. There is no feasible alternate location.

4.3.2.3 Alternative 2C – Alternate High Pressure HDD (TP/IP HDD) Alignment

This alternative involves the installation of an NPS 12 (323 mm) gas line across the Fraser River near the New Bridge, as shown below in Figure 4-5. There would be drill entry points on each side of the Fraser River that would meet in the middle. The new pipe would be strung and welded together along McBride Boulevard. The length of the HDD would be approximately 1,340 meters. The drill path would run parallel and approximately 16 metres upstream (on the North side) of the alignment of the New Bridge.

On the south end, the gas line would require additional onshore piping to connect to the Pattullo Gate Station via a short HDD under Highway 17 and SFR Railway, shown in red in Figure 4-5. On the north end, a new pressure regulating station would be required where the gas pressure would be reduced to 700 kPa and a new DP gas line would be tied into the NPS 20 DP gas line on McBride Boulevard, as shown in purple in Figure 4-5.

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¹¹ Image taken from MoTI Pattullo Bridge Replacement Project Business Case Scope Sketches, May 2018.

- Significant traffic disruption during pipeline stringing, construction, and testing on McBride Boulevard, resulting in road lane closures for several months;
- Permitting challenges due to multiple railway crossings; and
- Compounding schedule effects to both FEI and the Pattullo Bridge Replacement Project should the HDD fail on the first attempt due to uncertain geological profile.

4.3.2.4 Alternative 2D – Other Trenchless Methodologies

Given that the HDD alternatives were not feasible, FEI requested that the drilling contractor perform an analysis of alternate trenchless methodologies to cross the Fraser River within proximity to the Pattullo Bridge. The other methodologies reviewed by the construction contractor included micro-tunnelling and direct pipe. The construction contractor found that the most promising technology would be micro-tunnelling, which is a method of constructing a tunnel that involves underground installation of a casing pipe, without removal of the ground above the pipe and without requiring entry by personnel. However, the construction contractor concluded that none of the trenchless technologies would be successful at crossing the Fraser River in this area, for the following reasons:

- A crossing length in excess of 750 meters and a depth of at least 70 metres to avoid liquefaction induced flow would make it the longest and deepest attempted micro-tunnel in North America, as of the date of the study. Typical lengths and depths are 600 metres and 35 metres, respectively;
- The required hydrostatic pressure to accommodate the depth would be twice what current technologies are capable of withstanding;
- Geotechnical data indicated that mixed ground (till, cobble and bedrock) would be encountered, which would cause cutter head selection challenges and/or replacements (based upon similar infrastructure projects in the vicinity); cutter head replacements at this depth would require an airlock system, increasing the diameter of the boring machine to at least 2.0 m; and
- Limited availability of experienced contractors in North America to meet the Project schedule.

4.3.3 Alternative 3 – Through Richmond with Fraser River Crossing Screened Out Based on Inability to Meet Schedule Requirements

This alternative involves gas line installations in the Cities of Richmond and Burnaby and a trenchless crossing of the Fraser River. There are two configurations to achieve this alternative:

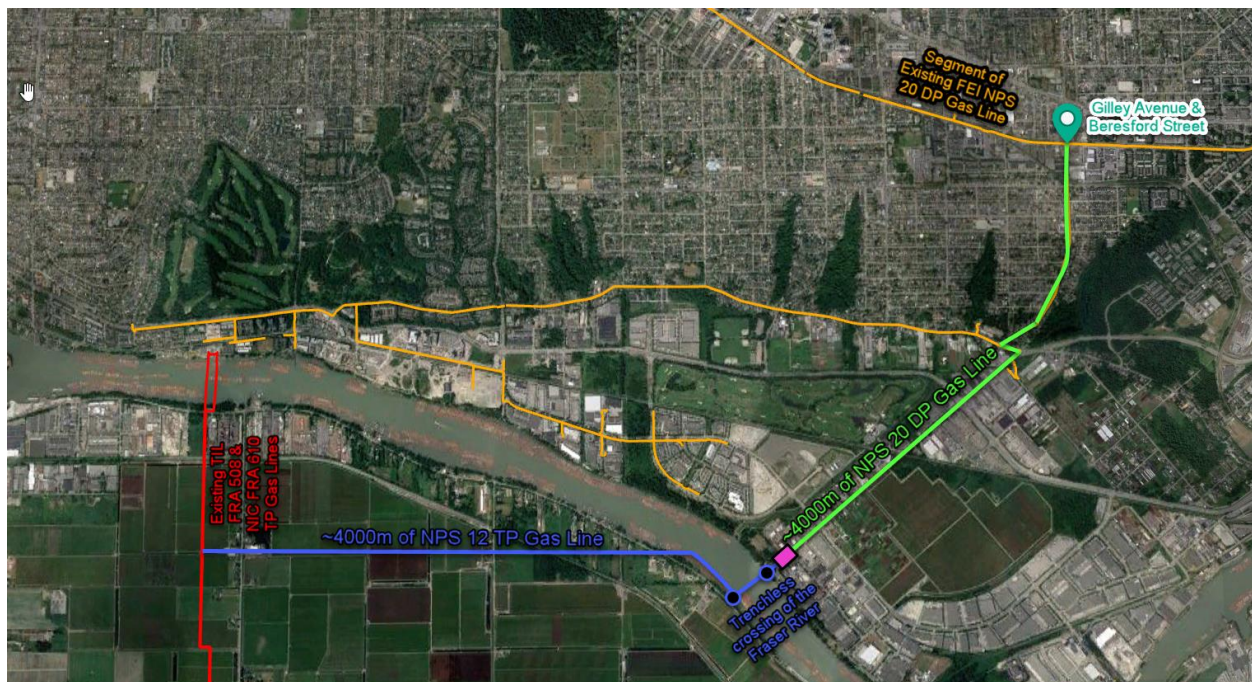
- Alternative 3A - TP Gas Line with one Gate Station; and
- Alternative 3B - IP Gas Line with one Gate Station and one District Station.

Both of these configurations were screened out based on their inability to meet the Project schedule objective. The description and analysis of these two configurations are provided in sections below.

4.3.3.1 Alternative 3A – TP Gas Line with 1 Gate Station

This alternative involves the installation of an NPS 12 (323 mm) TP gas line for approximately 4,000 metres in the City of Richmond which would tie into the TIL FRA 508¹² and NIC FRA 610¹³ gas lines, near Cambie Road and No. 7 Road (see blue line in Figure 4-6). A trenchless crossing (either HDD or micro-tunnel) of the north arm of the Fraser River would be required between the Cities of Richmond and Burnaby. The gas would be fed to a new TP/DP gate station (shown in purple) at Byrne Road and Mountbatten Street in the City of Burnaby, where the gas pressure would be reduced to 700 kPa. Approximately 4,000 metres of NPS 20 (508 mm) 700 kPa DP gas line would be installed along Byrne Road, continuing north onto Gilley Avenue to tie-in to the DP 700 kPa system at Gilley Avenue and Beresford Street (see green line in Figure 4-6).

Figure 4-6: Map of Richmond – TP to DP Alternative



4.3.3.2 Alternative 3B – IP Gas Line with 1 Gate Station and 1 District Station

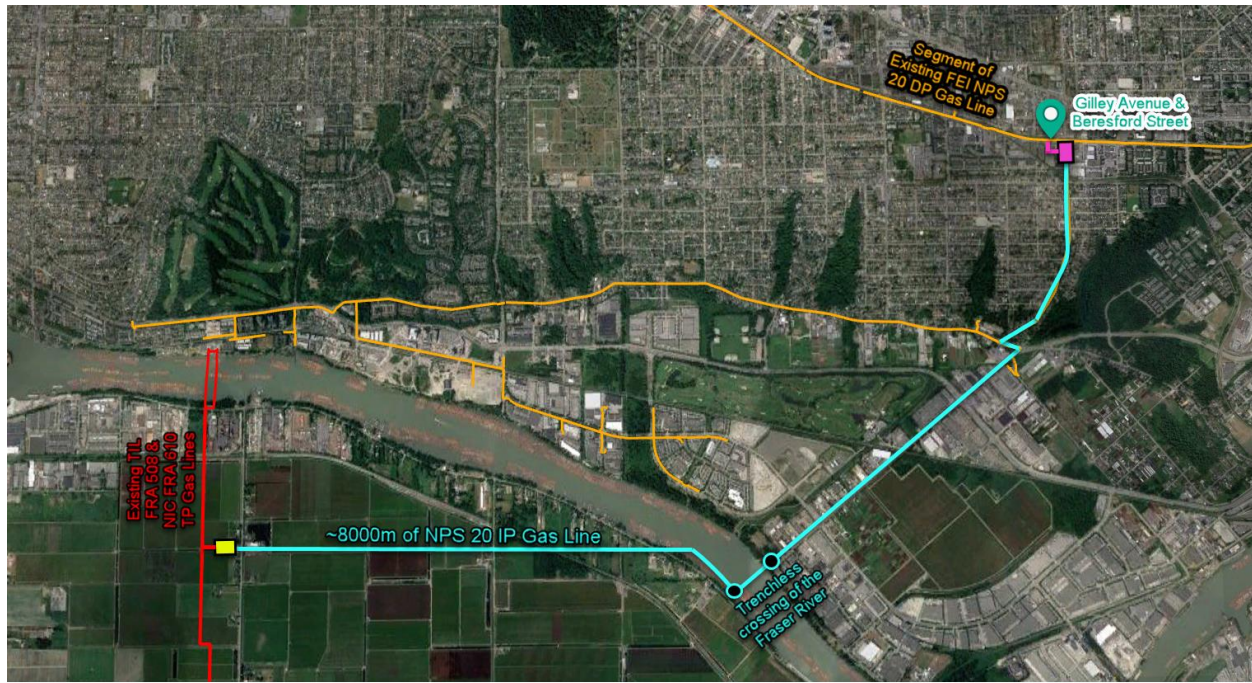
This alternative would tie into the TIL FRA 508¹² and NIC FRA 610¹³ gas lines at the same location as Alternative 3A described above, which would be fed directly into a new TP/IP gate station (shown in yellow in Figure 4-7 below). The gas pressure would be reduced to 1,200 kPa (i.e., intermediate pressure) and approximately 8,000 metres of NPS 20 (508 mm) IP gas line would be installed along the same route as above to Gilley Avenue and Beresford Street (see light blue line), including a trenchless crossing of the Fraser River. At Gilley Avenue and

¹² Tilbury to Fraser Gate 508mm Outer Diameter (OD) operating at 4020 kPa.

¹³ Nichol to Fraser Gate 610mm OD operating at 4020 kPa.

Beresford Street, a new IP/DP district station (shown in purple) would reduce the gas pressure to 700 kPa and tie into the existing DP 700 system.

Figure 4-7: Map of Richmond – TP to IP to DP Alternative



4.3.3.3 Analysis of Alternatives 3A and 3B

FEI determined that the Through Richmond with Fraser River Crossing Alternatives 3A and 3B were not feasible for the following reasons:

1. A significant portion of the Richmond section of this alternative includes acquiring new Statutory Right-of-Way (SRW) across private farmland which has a significant public impact. The SRW is required to be 18 metres wide for the TP alternative and 10 metres wide for the IP alternative. Further, the IP alternative would require the acquisition of land in Richmond for a new TP/IP gate station. Approximately 30 individual properties identified along the proposed route in Richmond are in the Agricultural Land Reserve, requiring approval from the Agricultural Land Commission for a gas line corridor. The time required for negotiations with landowners, in addition to a subsequent application to the Agricultural Land Commission, would exceed the Project schedule requirements.
2. There is a lack of existing geotechnical information to depths sufficient to adequately characterize the geotechnical risks at the crossing location for the trenchless Fraser River crossing in this location. Therefore, to assess the feasibility of this alternative, an extensive borehole drilling program in the Fraser River would be required and would involve several lengthy permit applications. FEI has recent experience with an HDD

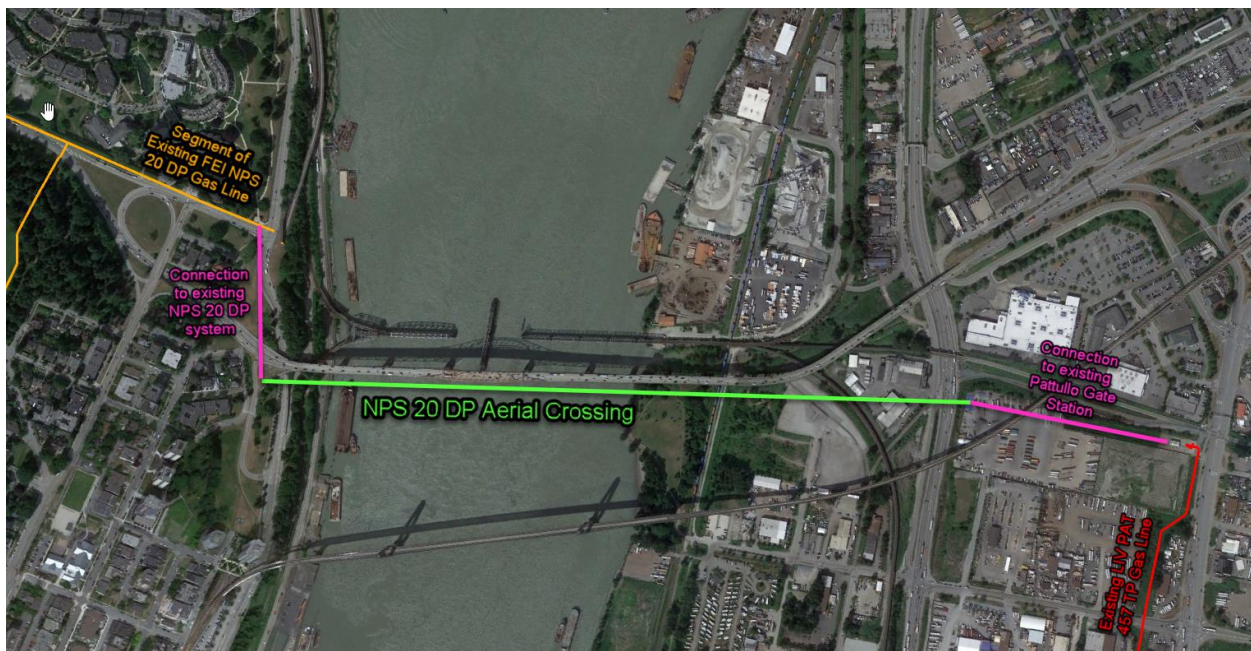
crossing project¹⁴ approximately 3,700 metres downstream of this location that required substantial geotechnical information. Even with the comprehensive geotechnical data, the project experienced several challenges in successfully completing the HDD causing significant delay from the original schedule.

For the reasons outlined above, FEI concluded that these alternatives pose a significant project schedule risk and cannot be constructed prior to the Pattullo Bridge demolition and decommissioning. As a result, FEI determined that this alternative is not feasible.

4.3.4 Alternative 4 – Aerial Gas Line Crossing Screened Out Based on Inability to Meet Schedule Requirements

This alternative involves the construction of an aerial gas line support structure across the Fraser River near the Pattullo Bridge. The structure would support an NPS 20 (508 mm) 700 kPa DP gas line which would tie-in to the existing Pattullo Gate Station in the City of Surrey and the NPS 20 DP gas line near McBride Boulevard in the City of New Westminster as shown in Figure 4-8 below. In addition to the evaluation of FEI building its own support structure, FEI reviewed the feasibility of using the existing Pattullo Bridge piers upon decommissioning of the bridge for the aerial crossing. However, it was determined that this option would not allow FEI to meet the Project schedule requirements.

Figure 4-8: Map of Aerial Gas Line Crossing



¹⁴ BCUC Decision and Order C-02-09, dated March 12, 2009. Online: https://www.bcuc.com/Documents/Proceedings/2009/DOC_21279_TGI%20Fraser%20River%20Crossing%20Decision.pdf

4.3.4.1 Analysis of Alternative 4

FEI determined that the Aerial Gas Line Crossing alternative was not feasible because it could not meet the Project's objective to be completed in advance of the scheduled Pattullo Bridge demolition, for the following reasons:

1. Due to the high impact structural requirements of an aerial crossing of the Fraser River, there are several long lead-time permits required for in-river geotechnical investigations and for the construction phase. Several of the identified permits must be filed sequentially with approval prior to design activities followed by construction start. This long lead-time permitting process prevents this alternative from meeting the project schedule timelines. The permits required include but are not limited to:

a) Environmental Assessment Certificate (EAC)	2 to 2.5 years
b) MoTI Approvals	6 to 12 months
c) Section 11 Water Sustainability Act Approval	1 to 1.5 years
d) Fisheries Act Authorization	4 to 6+ months
e) Vancouver Fraser Port Authority Project and Environmental Review	6 to 8 months

2. The proximity in both time and location to MoTI's Pattullo Bridge Replacement Project would result in challenges associated with cumulative effects of the two projects. It is likely that the Cities of Surrey and New Westminster, Indigenous communities and the public would take an increased interest in an aerial gas line crossing due to the visual impact, and perceived fisheries or watercourse impacts. As a result, FEI does not expect that it could complete the stakeholder engagement and consultation process in time to meet Project schedule requirements.

4.3.5 Alternative 5 – Peak Shaving Facility / Virtual Gas Line

This alternative involves supplementing the City of New Westminster DP system using a peak shaving facility or virtual gas line. A virtual gas line consists of compressing and transporting natural gas via trucks from a supply location to a pressure reduction station without the need for permanent transmission gas line infrastructure. Without the existing Pattullo Gas Line or replacement, there would be a need for a virtual gas line or peak shaving facility to meet customer demand through the winter.

A peak shaving facility or virtual gas line would be required when temperatures drop below minus 1°C. Within the New Westminster area, it is normal for temperatures to drop to minus 1°C or below in late fall and winter, sometimes for extended periods.

Under peak demand conditions (approximately minus 12°C), the peak shaving facility or virtual gas line would need to deliver approximately 100,500 standard cubic metres per hour (Sm³/hr)

of gas into the system. For comparison, FEI's legacy Tilbury LNG peak shaving facility has a send-out capability of approximately 172,000 Sm³/hr of gas.

There are two delivery alternatives (LNG and CNG) described below, by which the required demand or load could be supplied using a peak shaving facility or virtual gas line. Both of these sub-alternatives were determined to be not feasible for the reasons outlined below.

4.3.5.1 Alternative 5A – LNG

To meet the capacity shortfall at peak demand and generate 100,500 Sm³/hr of gas, approximately 167 m³ of LNG would be required (LNG has an volumetric energy density approximately 600 times greater than that of atmospheric pressure natural gas). If this load were supplied via a virtual gas line, approximately 4 LNG trailers per hour would be required. If this load were supplied by a peak shaving facility, approximately 28,000 m³ of LNG would need to be stored to provide a one-week supply during peak demand conditions. A tank similar to the size of the legacy Tilbury LNG storage tank (26,000 m³) would be need to be constructed in Burnaby, New Westminster or Coquitlam.

4.3.5.1.1 ANALYSIS OF ALTERNATIVE 5A

During peak demand, four LNG trailers per hour would be required to supply the required load via a virtual gas line. Any interruption in the delivery and injection of LNG, such as traffic disruption between Tilbury LNG and the injection point in New Westminster, could result in the loss of pressure in the system and significant customer outages. Therefore, this solution is not feasible.

To supply the above demand during peak periods, a peak shaving facility with an LNG storage tank comparable to the legacy Tilbury LNG storage tank (0.6 BCF) would be required. A large area of land would need to be acquired and rezoned in order to build an LNG storage facility with setbacks sufficient to meet the requirements of CSA Z276-18 Liquefied Natural Gas (LNG) – Production, storage and handling. Finding an appropriate site for a tank of this size within New Westminster, Burnaby or Coquitlam would be challenging, and the timeline to complete this alternative would exceed the Project schedule requirements.

4.3.5.2 Alternative 5B – CNG

CNG provides a much lower energy density when compared to LNG and is therefore limited in its ability to meet demand. The energy density differential means that significantly more trailers and / or a larger storage tank would be required to deliver equivalent quantities of gas.

4.3.5.2.1 ANALYSIS OF ALTERNATIVE 5B

Since LNG is not able to meet the large capacity requirement, CNG is also not feasible since it has a smaller volumetric ratio (LNG has an energy density many times greater than that of compressed natural gas). For comparison, during peak demand approximately 12 CNG trucks

per hour would be required to supply the required load via virtual gas line. This would not be feasible.

4.4 EVALUATION OF OVERLAND GAS LINE ALTERNATIVE

This section describes FEI's evaluation of Alternative 6 and its sub-alternatives (route corridors) to replace the system capacity provided by the Pattullo Gas Line while meeting project schedule requirements.

4.4.1 Alternative 6 – Overland Gas Line

The Overland Gas Line alternative includes gas line installations in the Cities of Burnaby, Coquitlam, New Westminster and / or Vancouver.

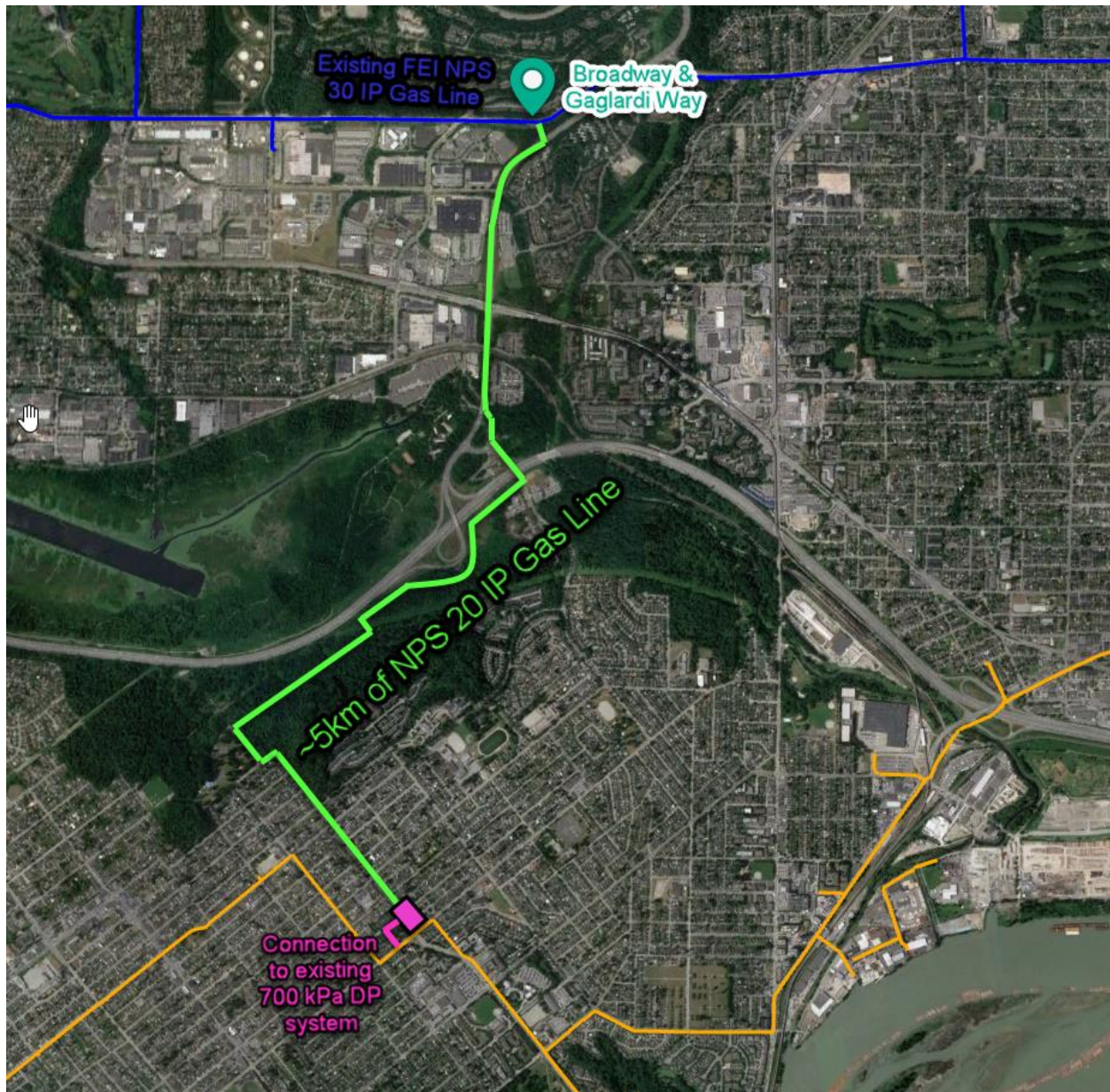
Potential route corridors were identified by completing a search over a broad area between available start and end points to interface with existing infrastructure. An ideal 'straight line' route of interest between these points is identified so that key issues and constraints affecting the selection of the route can be plotted and assessed. Through this process, three potential route corridors were identified and evaluated. The description and evaluation of the three route corridors are provided in the sections below.

4.4.1.1 Alternative 6A – Broadway and Gaglardi Way Corridor

As shown in Figure 4-9 below, the Broadway and Gaglardi Way Corridor option involves the installation of approximately 5 km of NPS 20 (508 mm) IP gas line in the City of Burnaby (see green line). The gas line would tie into the newly constructed NPS 30 (762 mm) Coquitlam to Vancouver IP gas line¹⁵ at Broadway and Gaglardi Way. The IP gas line would then continue south towards the City of New Westminster and feed a new district station (shown in purple) to be located near the intersection of McBride Boulevard and 10th Avenue in the City of New Westminster. A short connection would be required between the district station outlet and the existing DP 700 kPa system. Refer to Figure 4-9 for a map of the corridor.

¹⁵ BCUC Order C-11-15, dated October 16, 2015.

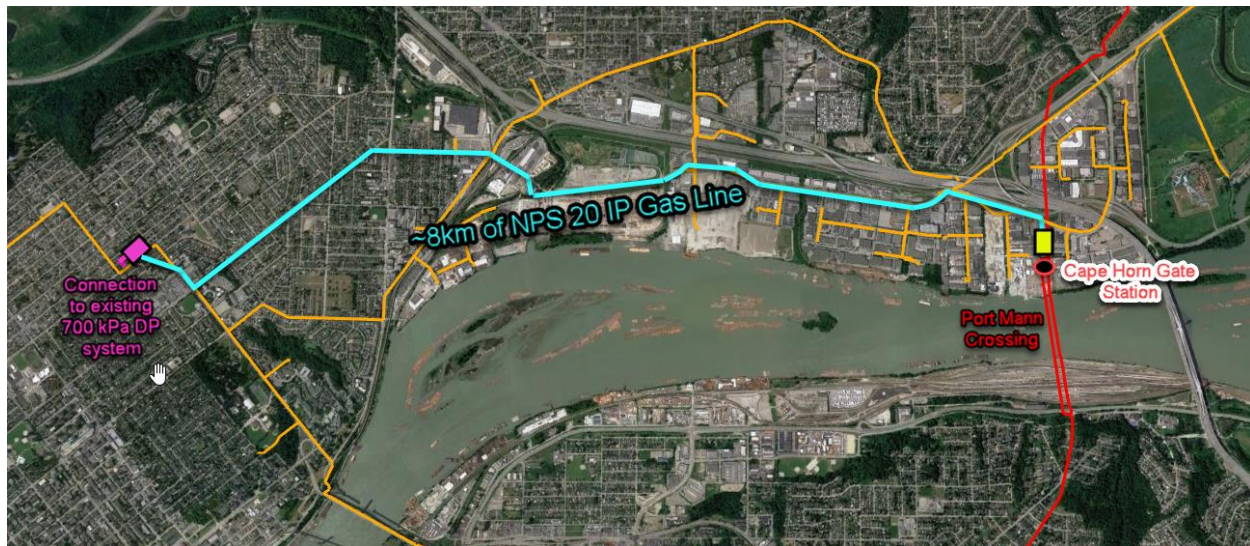
Figure 4-9: Map of Broadway and Gaglardi Way Route Corridor



4.4.1.2 Alternative 6B – Cape Horn Gate Corridor

As shown in Figure 4-10 below, the Cape Horn Gate Corridor option involves the installation of approximately 8 km of NPS 20 IP gas line in the Cities of Coquitlam and Burnaby (see light blue line). A new TP/IP gate station (shown in yellow) would tie-in to the NPS 20 (508 mm) TP gas line within the Cape Horn Gate Station in the City of Coquitlam. The NPS 20 IP gas line would continue west to a new IP/DP district station (shown in purple) located near the intersection of McBride Boulevard and 10th Avenue in the City of New Westminister. A short connection would be required between the IP/DP district station outlet and the DP 700 kPa system. Refer to Figure 4-10 for a map of the corridor.

Figure 4-10: Map of Cape Horn Gate Route Corridor



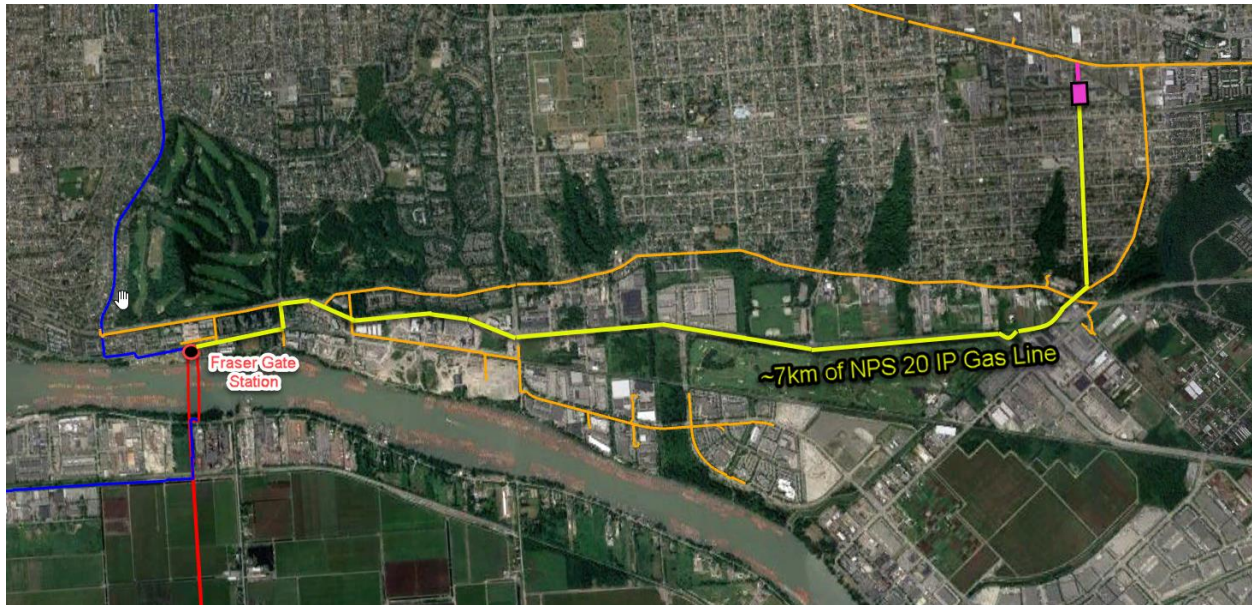
4.4.1.3 Alternative 6C – Fraser Gate Corridor

The Fraser Gate Corridor option involves the installation of approximately 7 km of NPS 20 (508 mm) IP gas line starting at Fraser Gate Station in the City of Vancouver (see yellow line) and continuing east to a new IP/DP district station (shown in purple) located near the intersection of Beresford Street and Buller Avenue in the City of Burnaby. A short connection would be required between the district station outlet and the DP 700 kPa system. Refer to Figure 4-11 for route map of the corridor.

4.4.1.4 Alternative 6D – Sperling Avenue Corridor

As part of FEI's ongoing consultation and negotiation with the City of Burnaby, on July 31, 2020, City of Burnaby staff requested that FEI investigate Alternative 6D. At the time of filing this Application, FEI is investigating the feasibility of Alternative 6D. FEI will provide a description of this route in an evidentiary update, after it has consulted with the City of Burnaby and other stakeholders.

Figure 4-11: Map of Fraser Gate Route Corridor



4.4.2 Evaluation Of Alternatives 6A, 6B and 6C

Prior to the identification of Alternative 6D, FEI evaluated Alternatives 6A, 6B and 6C using non-financial and financial criteria.

The non-financial and financial evaluation criteria that FEI used to compare the three Overland Gas Line route corridors are listed below and discussed in detail in Sections 4.4.2.1 and 4.4.2.2 below.

1. Non-Financial Criteria:

- Schedule Impacts
- Community, Indigenous and Stakeholder Impacts
- Environmental and Archaeological Impacts

2. Financial Criterion:

- Levelized Delivery Rate Impact

The replacement of FEI's distribution system resiliency was not included as a criterion in the Overland Gas Line alternatives evaluation as all three route corridors would erode the existing system resiliency by requiring other major gate stations in the system to provide the capacity previously provided by the Pattullo Gas Line. Alternatives 6A and 6C will shift the Pattullo Gas Line load onto Coquitlam Gate and Fraser Gate, respectively, consuming a portion of the available capacity in the Transmission pressure gas lines feeding these stations and the IP gas lines leaving these stations. Similarly, Alternative 6B erodes resiliency by either:

- Consuming a portion of the transmission gas lines' capacity feeding Coquitlam Gate, thereby effectively limiting the available supply from Coquitlam Gate station should Fraser Gate fail; or
- Consuming a portion of the available capacity at the gas lines into or out of Fraser Gate should the Port Mann crossing supplying Cape Horn and Coquitlam Gate stations fail.

As described in Section 3.6, this results in Coquitlam Gate and Fraser Gate being unable to support customers on cold winter days should either one of the stations be lost.

4.4.2.1 Non-Financial

The following non-financial evaluation criteria were used to evaluate the three route corridors:

1. **Schedule Impacts:** the ability to ensure the new system will be in-service to meet the MoTI schedule, impacted by several factors including:
 - Estimated timelines for meaningful engagement to obtain the necessary permit approvals required for project execution; and
 - Estimated timelines for construction with regard to municipal bylaws which restrict working hours, traffic management staging as required by the City, working in and around existing third party utilities and construction methodologies.
2. **Community, Indigenous and Stakeholder Impacts:** each route corridor would have varying challenges that would affect the project from a cost and feasibility perspective including:
 - Community infrastructure along the route corridor directly impacted during construction such as schools, hospitals, recreation centres, etc.;
 - Private properties and businesses along the route corridors directly impacted during construction; and
 - Indigenous communities directly impacted by Project.
3. **Environmental and Archaeological Impacts:** each route corridor would have varying challenges that would affect construction and the continued long term operation of each route corridor including:
 - Presence of federally and/or provincially at-risk species, critical habitat, fish-bearing watercourses, or fish habitat;
 - Presence of unique habitats or greenspaces (e.g., wetlands, parks or forested areas); and
 - Presence of known archaeological and/or heritage sites and relative importance to Indigenous groups (if known).

4.4.2.2 Financial

The following financial criterion was used to evaluate the three route corridors:

1. **Levelized Delivery Rate Impact:** Ability for an alternative to be completed with the lowest possible delivery rate impact over the approximate financial life of the asset (i.e., 73-year analysis period) for the PGR Project. Alternatives that minimize the levelized delivery rate impact to FEI's non-bypass customers score the highest.

FEI considered the long-term rate impact to FEI's non-bypass customers by financially comparing the present value (PV) of the incremental revenue requirement as well as the levelized delivery rate impact over the 73-year analysis period¹⁶ for the three Overland Gas Line alternatives based on the estimated capital cost and operating cost. These cost estimates were based on information available in March 2020,¹⁷ and are considered to be AACE Class 5 estimates. The cost estimates were benchmarked against the LMIPSU Project. The LMIPSU Project is a particularly relevant benchmark, as it was recently completed and faced similar urban construction challenges that would be expected for the three overland routes considered for the PGR Project. For a fair comparison, future replacement costs in terms of sustainment capital over the 73-year analysis period for each Overland Gas Line alternatives are included.

4.4.2.3 Scoring and Weighting

Table 4-3 below shows the weighting applied for the PGR Project between non-financial and financial criteria, and also shows the weightings within the non-financial and financial criteria as described in Section 4.4.2 above. The weightings were determined through collaborative discussions with FEI's subject matter experts. In order to meet the stringent PGR Project schedule requirements driven by the Pattullo Bridge Replacement Project, FEI weighted schedule impacts highest. For non-financial evaluation criteria, each overland alternative was scored by subject matter leads based on system analysis and experience of similar projects using a scale from 1 to 3 as defined in Table 4-4 below. For financial criteria, the Overland Gas Line alternatives (6A, 6B and 6C) were evaluated from the lowest levelized delivery rate impact to the highest using a scale from 1 to 3.

¹⁶ The 73-year analysis period is based on the 70 years of post-project analysis period plus 3 prior years for the estimate construction schedule for the Project from 2020 to 2022. The 70-year post-project analysis period was chosen based on the currently approved depreciation rate of Distribution Main pipe (which also includes Intermediate Pressure pipe) at 1.35 percent (or 74 years), rounded down to 70 years.

¹⁷ FEI's Class 5 cost estimate for Alternative 6A does not take into account recent information gained from FEI's consultation and negotiations with the City of Burnaby over the course of 2020.

Table 4-3: Weightings within Non-Financial and Financial Criteria

Evaluation Criteria	Weighting
<u>Non-Financial</u> <ul style="list-style-type: none"> Schedule Impacts Community, Indigenous and Stakeholder Impacts Environmental and Archaeological Impacts 	90% (54%) (22.5%) (13.5%)
<u>Financial</u> <ul style="list-style-type: none"> Levelized Delivery Rate Impact 	10%

Table 4-4: Non-Financial Evaluation Scoring Definitions

Score	Impact Evaluation
3	Good Choice: Minimal concerns or risks with some positive impact
2	Acceptable Choice: Moderate concerns and risks; or medium positive impact
1	Poor Choice: Significant concerns or risks; no positive impact

4.4.2.4 Non-Financial Evaluation Summary

Table 4-5 below provides a summary of the weighted scores and a rationale for this scoring against the non-financial evaluation criteria of Schedule Impacts, Community, Indigenous and Stakeholder Impacts, and Environmental and Archaeological Impacts. For reasons outlined in Table 4-5 below, Alternative 6A – Broadway and Gaglardi Way Route Corridor was found to be superior to Alternatives 6B and 6C based on the highest weighted score using all non-financial criteria. Furthermore, based on the significant schedule impacts (see reasons in Table 4-5 below), it was determined that Alternatives 6B and 6C would not meet Project schedule requirements and were therefore considered to be not feasible.

Table 4-5: Non-Financial Evaluation Summary of Overland Gas Line Route Corridors

Criterion	Alternative 6A: Broadway & Gaglardi Way Corridor	Alternative 6B: Cape Horn Gate Corridor	Alternative 6C: Fraser Gate Corridor
Schedule Impacts (Weighting – 60%)	3 <ul style="list-style-type: none"> Project does not cross private land so no private land SRW negotiations are required Permitting required from one 	1 <ul style="list-style-type: none"> Requires negotiations with private landowners for RoW access and is expected to be a lengthy process 	1 <ul style="list-style-type: none"> Requires negotiations with private landowners for RoW access and is expected to be a lengthy process

Criterion	Alternative 6A: Broadway & Gaglardi Way Corridor	Alternative 6B: Cape Horn Gate Corridor	Alternative 6C: Fraser Gate Corridor
	municipality <ul style="list-style-type: none"> Overall less congestion of third party utilities in route corridor compared to other alternatives 	<ul style="list-style-type: none"> Increased complexity and coordination required due to permitting from two municipalities High congestion of third party utilities along/near United Boulevard leading to increased complexity for construction 	<ul style="list-style-type: none"> Increased complexity and coordination required due to permitting from two municipalities High congestion of third party utilities along Buller Ave leads to increased complexity for construction
Community, Indigenous and Stakeholder Impacts (Weighting – 25%)	3	1	1
	<ul style="list-style-type: none"> Less than 10 businesses potentially impacted Minimal impact to private lands 	<ul style="list-style-type: none"> More than 100 businesses potentially impacted Some impacts to private lands 	<ul style="list-style-type: none"> More than 50 businesses potentially impacted Significant impacts to private lands Impacts City of Vancouver without any system benefit to constituents
Environmental and Archaeological Impacts (Weighting – 15%)	1	1	3
	<ul style="list-style-type: none"> Critical habitat for several at-risk species; however mitigation available through re-routing Several fish-bearing watercourses, including the Brunette River Crosses, or is located within close proximity to wetlands and riparian areas Known archaeological site; however, mitigation 	<ul style="list-style-type: none"> Intersects with Critical Habitat in surrounding multiple watercourse, within the Brunette River Several watercourses are red-coded (fish-bearing) creeks Potential for encountering contaminated soil, or water Does not interact directly with any 	<ul style="list-style-type: none"> Low environmental interactions Low likelihood of impacting fish or fish habitat No known archaeological or heritage sites

Criterion	Alternative 6A: Broadway & Gaglardi Way Corridor	Alternative 6B: Cape Horn Gate Corridor	Alternative 6C: Fraser Gate Corridor
	available through micro-routing ¹⁸ , <ul style="list-style-type: none"> Known heritage site 	known archaeological or heritage sites <ul style="list-style-type: none"> Close proximity to known sites in New Westminster and proximity to Fraser River increases likelihood of chance finds 	
Weighted Total¹	2.7	1.3	1.3

Note:

¹ Weighted total is calculated for each alternative by multiplying the score for each criterion with its associated weighting and then summing the scores. The maximum possible weighted total is 3.

4.4.2.5 Financial Evaluation Summary

Table 4-6 below shows the financial comparison between the three overland gas line route corridors in terms of levelized delivery rate impact over a 73-year analysis period to FEI's non-bypass customers. As discussed in Section 4.4.2.3, the Overland Gas Line alternatives (Alternatives 6A, 6B and 6C) were evaluated financially from the highest levelized delivery rate impact to the lowest using a scale from 1 to 3 (i.e., a score of 3 for the lowest levelized rate impact), which is also shown in Table 4-6 below. Based on their financial evaluation, Alternative 6A: Broadway and Gaglardi Way Corridor has the lowest levelized delivery rate impact to FEI's non-bypass customers.

Table 4-6: Financial Evaluation Summary

	Alternative 6A: Broadway and Gaglardi Way Corridor	Alternative 6B: Cape Horn Gate Corridor	Alternative 6C: Fraser Gate Corridor
Total Capital Costs, AACE Class 5, 2019 (\$ millions)	122.2	184.3	167.3
PV of Incremental Revenue Requirement¹⁹ over 73 years (\$ millions)	125.8	190.0	171.5

¹⁸ Micro-routing analysis will be provided as part of Section 5 of the Application to be filed as evidentiary update in September 2020

¹⁹ The incremental revenue requirements have been discounted at the after tax cost of capital for FEI based on FEI's capital structure, rates of return, income tax rate for 2020 as per the FEI's Annual Review for 2020 and 2021 Rates, filed on August 12, 2020, Schedule 11 – 2020, Schedule 26.

	Alternative 6A: Broadway and Gagliardi Way Corridor	Alternative 6B: Cape Horn Gate Corridor	Alternative 6C: Fraser Gate Corridor
Levelized Delivery Rate Impact over 73 years (in \$/GJ)	0.036	0.054	0.048
Average Residential UPC (in GJ/yr)	90	90	90
Average Residential Bill Impact per year over 73 years (in \$)	3.2	4.8	4.4
Financial Evaluation Score	3	1	2

4.4.2.6 Summary of Assessment of Alternatives 6A, 6B and 6C

The following Table 4-7 provides a summary of FEI's assessment of the three route corridors against all evaluation criteria.

Table 4-7: Overall Alternative Evaluation Summary

Criterion	Weighting	Alternative 6A: Score	Alternative 6B: Score	Alternative 6C: Score
Schedule Impacts	54%	3	1	1
Community, Indigenous and Stakeholder Impacts	22.5%	3	1	1
Environmental and Archaeological Impacts	13.5%	1	1	3
Rate Impact	10%	3	1	2
Weighted Score:¹	100%	2.73	1	1.37

Note:

¹ Weighted total is calculated for each alternative by multiplying the weighted score for each criterion with its associated overall weighting, and then summing these scores. The maximum possible weighted total is 3.

FEI's evaluation of the three Overland Gas Line route corridors against the financial and non-financial weighted criteria (as shown in table above), the Broadway and Gagliardi Way Corridor

1 had the overall least schedule, community, and financial impact based on AACE Class 5 capital
2 cost estimates.

3 **4.4.3 Ongoing Consultation and Negotiation with City of Burnaby**

4 FEI first presented Alternative 6A to the City of Burnaby staff on February 11, 2020 and has
5 continued to consult and negotiate with the City since that time. Over the course of 2020, FEI
6 has discussed with the City the merits of the identified route in the Broadway and Gaglardi Way
7 Corridor - the Gaglardi Route. On July 20, 2020 City of Burnaby Council passed a
8 recommendation brought forward by the City's Finance Management Committee to "oppose the
9 proposed FortisBC Pattullo Gas Line Replacement Project pipeline route through Burnaby".²⁰
10 On July 31, 2020, the City requested that FEI investigate a new route on Sperling Avenue in the
11 City of Burnaby - the Sperling Route. FEI investigation of the Sperling Route continues at the
12 time of filing this Application.

13 Over the course of September 2020, FEI will be continuing to investigate the feasibility of the
14 Sperling Route and whether it would be supported the City of Burnaby. If it is feasible and
15 supported by the City, the Sperling Route may be the most cost effective alternative for the
16 Project. If the Sperling Route is determined not to be feasible or is not supported by the City, or
17 is otherwise not preferred, then FEI anticipates that it will complete its Application based on the
18 Gaglardi Route as its preferred route for the Project.

19 FEI will file the remainder of its alternatives analysis, including its determination regarding the
20 preferred route for the Project, in an evidentiary update.

²⁰ See Burnaby Council Minutes, Page 7 Section 4.8. Online:
<https://pub-burnaby.escribemeetings.com/FileStream.ashx?DocumentId=47967>

1 **5. PROJECT DESCRIPTION**

2 FEI will file Section 5 of the Application in an evidentiary update.

1 **6. PROJECT COST ESTIMATE**

2 FEI will file Section 6 of the Application in an evidentiary update.

1 **7. ENVIRONMENT AND ARCHAEOLOGY**

2 FEI will file Section 7 of the Application in an evidentiary update.

1 **8. CONSULTATION**

2 FEI will file Section 8 of the Application in an evidentiary update.

9. PROVINCIAL GOVERNMENT ENERGY OBJECTIVES AND LONG TERM RESOURCE PLAN

9.1 INTRODUCTION

This section discusses the factors that section 46(3.1) of the UCA states the BCUC must consider when determining whether to issue a CPCN:

- (a) the applicability of British Columbia's energy objectives,
- (b) the most recent long-term resource plan filed by the public utility under section 44.1, if any, and
- (c) the extent to which the application for the certificate is consistent with the applicable requirements under sections 6 and 19 of the *Clean Energy Act* (CEA).

Sections 6 and 19 of the CEA as referred to in (c) above, do not apply to FEI. FEI addresses the other two requirements below.

9.2 BRITISH COLUMBIA'S ENERGY OBJECTIVES

The Project will support the British Columbia energy objective in section 2(k) of the CEA "to encourage economic development and the creation and retention of jobs". The Project will support this objective by creating jobs and contributing to the local economy. The PGR Project will create jobs in BC through FEI's contractor, and result in the procurement of goods and services from locally owned and operated vendors and subcontractors. The increase in use of local dining and lodging accommodations during construction will also benefit the economy.

FEI will work with Indigenous and local leaders and organizations to develop the local workforce, support local businesses, and connect them to Project opportunities. For example, to promote Indigenous and other local participation in the Project, FEI will host business-to-business and worker-to-business networking events as appropriate, and where they can meet safety requirements associated with the COVID-19 pandemic. These events would facilitate introductions between Indigenous and other local business owners, members of the local workforce, and connect them to contract and employment opportunities.

9.3 LONG TERM RESOURCE PLAN

The PGR Project is described in Section 6.4 of FEI's most recently filed 2017 LTGRP. At the time of filing the 2017 LTGRP, MoTI (via TransLink) had indicated the existing bridge would be demolished and replaced by the end of 2021, and had directed FEI to remove its existing gas line by the end of 2021. Based on MoTI's current Pattullo Bridge replacement project schedule, demolition is now anticipated to proceed in 2023. Otherwise, the Project remains consistent with the 2017 LTGRP.

10. CONCLUSION

FEI submits that the PGR Project is in the public interest and should be approved.

As set out in Section 3 of the Application, it is clear that the PGR Project is necessary to replace the system capacity currently provided by the Pattullo Gas Line, which must be decommissioned. FEI must undertake the PGR Project to continue to provide safe and reliable natural gas service to customers residing in the communities of Burnaby, New Westminster and Coquitlam who rely on all or portion of their gas supply from the Pattullo Gas Line.

As described in Section 4 of the Application, FEI conducted a thorough evaluation of the alternatives for the PGR Project and has proposed a solution that meets the Project objectives and has the least impact in terms of technical design and scope complexity, cost, construction environmental, archaeological and societal impacts, and impacts to FEI's existing system capacity and resiliency. While a like-for-like replacement of the Pattullo Gas Line would have been desirable, MoTI rejected FEI's requests to attach a gas line on the New Bridge, and a trenchless crossing of the Fraser River was not feasible. Further, FEI's analysis of other alternatives demonstrated that an overland gas line was the only feasible alternative. FEI's evaluation of the Overland Gas Line route options showed that the route in the City of Burnaby has the least impact, and the only solution that can be implemented prior to the time when FEI must decommission the Pattullo Gas Line.

In an evidentiary update, FEI will describe the completion of its analysis of the proposed route for the PGR Project, taking into account its ongoing consultation and negotiations with the City of Burnaby. FEI will also provide a detailed description of the PGR Project, including its costs and rate impacts, an evaluation of the potential environmental and archaeological impacts of the Project, as well as FEI's thorough consultation with stakeholders and Indigenous communities on the PGR Project.

Based on the Application and evidentiary update(s), the Company requests that the BCUC grant a CPCN for the PGR Project and approve the PGR Application and Development Costs deferral account as requested.

Appendix A

MOTI CORRESPONDENCE



Pattullo Bridge Replacement Project

July 03, 2018

Sent via email: Gary.Johnson@fortisbc.com

Attention: Mr. Gary Johnson
Distribution Assets and Improvements Manager

FortisBC
16705 Fraser Highway
Surrey, BC V4N 0E8

Dear Mr. Johnson:

**Re: Pattullo Bridge Replacement Project (PBRP) – Existing Distribution Gas Pipeline on
Pattullo Bridge**

On February 16, 2018, the Province of British Columbia (the Province) announced that the PBRP would be funded, delivered, owned and operated by the Province. The new bridge will be open in 2023. TransLink will continue to own and operate the existing bridge until such time as the new bridge is in operation.

As a result of the Province's role in the PBRP, all design decisions fall under the purview of the Ministry of Transportation and Infrastructure (MoTI).

Further to TransLink's correspondence to FortisBC (Fortis) dated June 6, 2017 (the Letter), where the original agreement between the Province of British Columbia and the British Columbia Electric Company Limited (the Agreement) was referenced, Fortis was informed of Translink's intention to replace the existing Pattullo Bridge with a new structure crossing the Fraser River upstream of the existing crossing. The Letter provided notice to Fortis to move to alter its pipeline or cease transmission of gas at Fortis expense, in accordance with section 6 of the Agreement. Fortis was requested to removal all infrastructures associated with the 508mm gas pipeline from the bridge no later than June 30, 2021.

On January 25, 2018, Fortis requested approval from TransLink for permission to install either a new 508mm diameter distribution pressure pipeline on the new bridge, or alternatively a smaller 323mm diameter intermediate pressure pipeline performing the same function.

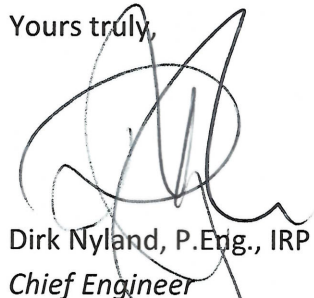
MoTI has reviewed Fortis' request to install a natural gas pipeline on the new bridge, and after careful consideration of all the factors, including the justifications put forward by Fortis, the decision reached is to not allow Fortis to install a replacement natural gas pipeline at either distribution or intermediate pressure on the new Pattullo Bridge.

The key points for this rationale are noted below:

- 1) MoTI's Utility Policy Manual notes that while distribution and intermediate pressure natural gas pipelines can sometimes be accommodated on provincial bridges, such pipelines are only considered when other crossing alternates are not feasible or if the alternate approaches result in environmental risk or other sensitivities. Fortis has developed potential alternate crossing options.
- 2) MoTI's policies of restricting natural gas pipelines on bridges are in line with other North American jurisdictions, where such installations are highly discouraged and only allowed as a last resort when no other feasible crossing alternative exists.
- 3) The new Bridge will be designed as a lifeline structure with the highest standard of seismic design, requiring the new bridge to be usable by traffic after a seismic event for both emergency response and economic recovery. The bridge is a key link between communities. The presence of a natural gas pipeline represents a significant risk to the reliability of the structure post a major seismic event that impacts the Greater Vancouver region.

All work required to relocate and remove the existing gas line off the existing bridge by June 30, 2021 will need to be coordinated with the PBRP team. Please coordinate this work with Wendy Itagawa, Executive Project Director for the Pattullo Bridge Replacement Project on behalf of the Ministry of Transportation and Infrastructure.

Yours truly,



Dirk Nyland, P.Eng., IRP
Chief Engineer



BRITISH
COLUMBIA

Pattullo Bridge Replacement Project

Ministry of Transportation

Ec: Wendy Itagawa, Executive Project Director, Pattullo Bridge Replacement Project

Lisa Gow, Executive Director, Major Projects and Alternate Procurement

By Email

28 September 2018

Ministry of Transportation and Infrastructure
PO Box 9850
Stn Prov Govt
Victoria BC
V8W9T5

Attention: Mr. Dirk Nyland, P.Eng.
Chief Engineer

Dear Mr. Nyland:

Re: Pattullo Bridge Replacement Project, FortisBC gas line

Thank you for your letter of July 3, 2018.

Since Translink's formal notice to FortisBC Energy Inc. ("FortisBC") of the decommissioning of the existing Pattullo Bridge and requiring FortisBC to remove our 508 mm gas line from the bridge, we have been working diligently towards the removal and replacement of this gas line.

To date we have identified options for the replacement of the gas line, carried out initial engineering assessments and commenced stakeholder engagement with Surrey, New Westminster and First Nations. As a result of this work we have identified:

- (a) Our preferred option for replacement of the existing gas line and serious challenges associated with the alternative options, and
- (b) Significant challenges for FortisBC to remove and replace the existing gas line within the deadline, given the time it takes to conduct detailed engineering studies and carry out the required community engagements.

As previously noted, our preference is for a new gas line on the new bridge because it is the least disruptive and most affordable option. However, we are now investigating horizontal directional drilling (HDD) as potential crossing alternatives. Our initial discussions with the municipalities have raised a number of new issues that could impose additional constraints on the feasibility of these HDD alternatives. These constraints may significantly increase the cost initially estimated at a Class 5, which would be passed on to our customers in the form of rates.

Based on the initial information provided, their concerns are that their communities would face increased construction disruptions (road closures, noise) and FortisBC may need to expand its proposed footprint in a residential New Westminster neighbourhood, specifically if a new regulator station is required for one of the HDD options. They asked us to provide them with more information on the project. Because of this we want to ensure we coordinate our work with the Ministry of Transportation and Infrastructure (MOTI), including on community engagement.

In addition, this project will meet the threshold required for a Certificate of Public Convenience and Necessity (CPCN) from the BC Utilities Commission. The CPCN guidelines require applicants to evaluate alternative options and provide the reason(s) why it did not consider them further. We will need to justify and provide the reasons for any decision to drill under the Fraser River, including detailed rationale addressing the municipalities' concerns and why the higher cost and more disruptive alternative was selected.

In our view, the on-bridge option remains the best solution. As noted in earlier correspondence (Initial Request letter, January 25, 2018), all FortisBC's gas lines are built to CSA Standard Z662 *Oil and Gas Pipeline Systems* and meet the requirements of the current MOTI Utility Policy Manual. FortisBC has successfully – and safely – installed and operated gas lines on more than 200 bridges in B.C. since 1957. We want to emphasize the following:

1. Any gas line on the new bridge will be designed to the same seismic design requirements as that of the bridge (1:2475).
2. FortisBC will be responsible for all the cost related to the installation and subsequent maintenance of the gas line on the new bridge.
3. Remote controlled valves, similar to ones installed on a number of gas lines in the Lower mainland, will be installed in the line at both ends of the new bridge. These valves could be closed when an event that could affect the integrity of the line is detected to ensure gas does not flow through it.

We are thus seeking an opportunity to meet with MOTI to further discuss:

- Options for a replacement gas line, including both the on-bridge and HDD alternatives.
- How MOTI's Pattullo Bridge replacement project schedule will impact the alternatives.
- Coordinating our work with MOTI's work, including on community engagement.

Finally, as stated above, the deadline provided to FortisBC by Translink to complete the removal of the gas line from the Pattullo Bridge does not give us enough time to complete a design, carry out necessary consultations, seek regulatory approvals and execute works. As a result, we respectfully request an extension to complete the required works and remove the existing gas line to September 30, 2022 (currently June 30, 2021).

Kindly confirm if you are available to meet.

Respectfully,



Joseph R. Sukhnandan, P. Eng.
Project Director, Major Projects Development
Joseph.sukhnandan@fortisbc.com

Ec: Ms. Wendy Itagawa, P. Eng., Executive Project Director, Pattullo Bridge Replacement Project



October 30, 2018

Ref: 281162

Sent via e-mail: joseph.sukhnandan@fortisbc.ca

Joseph Sukhnandan
Project Director, Major Projects Development
FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8

Dear Mr. Sukhnandan,

**Re: Pattullo Bridge Replacement Project –
Existing Distribution Gas Pipeline on Pattullo Bridge**

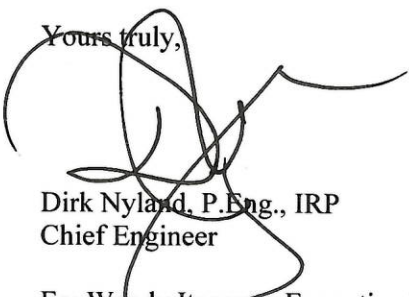
Thank you for your letter of September 28, 2018.

As set out in my letter of July 8, 2018 to your colleague, Mr. Gary Johnson, the Ministry of Transportation and Infrastructure (MoTI) reviewed Fortis' request to install a natural gas pipeline on the new bridge, and after careful consideration of all the factors the decision reached was not to allow Fortis to install a replacement natural gas pipeline at either distribution or intermediate pressure on the new Pattullo Bridge.

My letter set out the rationale for this decision, including relevant MoTI policy. In MoTI's view, this is a public safety issue. The new bridge will be designed as a lifeline structure and will be a vital link between communities should there be a significant seismic event. The ongoing integrity of the bridge will be key to facilitating an effective response and recovery plan after such an event. Given this context, and the fact that there are other options open to Fortis, MoTI does not intend to revisit the decision taken on this matter.

We do appreciate that there will need to be careful planning and cooperation between Fortis and the Pattullo Bridge Replacement Project with respect to replacement gas pipeline options. I would encourage you to meet with Wendy Itagawa, the Executive Project Director for the Pattullo Bridge Replacement Project, as soon as possible to discuss next steps, including your proposed extension to complete the works required to remove the existing gas pipeline.

Yours truly,



Dirk Nyland, P.Eng., IRP
Chief Engineer

Ec: Wendy Itagawa, Executive Project Director, Pattullo Bridge Replacement Project

Appendix B
DRAFT ORDERS



[CONFIDENTIAL]
ORDER NUMBER
G-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Energy Inc.
Application for Approval of a Certificate of Public Convenience and Necessity for the
Pattullo Gas Line Replacement Project

BEFORE:
[Panel Chair]
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. On August 31, 2020, FortisBC Energy Inc. (FEI) submitted an Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application) to the British Columbia Utilities Commission (BCUC) pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA);
- B. In the Application, FEI states that the PGR Project is needed to replace the capacity currently provided by its gas line affixed on the Pattullo Bridge, which is being replaced and demolished as part of the Pattullo Bridge Replacement Project;
- C. In seeking a CPCN for the PGR Project, FEI requests approval to:
 - 1. Construct and install in the City of Burnaby a 508 mm gas line that will operate at a maximum operating pressure (MOP) of 2,070 kPa;
 - 2. Construct and install a new district pressure regulating station (PRS);
 - 3. Construct and install a 508 mm gas line that will operate at a MOP of 700 kPa to connect the PRS to the distribution system;
 - 4. Abandon and remove the existing Pattullo Gas Station in the City of Surrey and approximately 800 m of 508 mm gas line operating at a MOP of 700 kPa affixed to the existing Pattullo Bridge, as will be described in section 5 of the Application;

5. Abandon in place approximately 1.2 km of the remaining 508 mm gas line operating at a MOP of 700 kPa from the Pattullo Gate Station to the intersection of McBride Boulevard and Royal Avenue in Burnaby, as will be described in section 5 of the Application; and
 6. Modify approximately 5.5 km of the Livingstone-Pattullo 457 mm Transmission Pipeline and associated work due to the removal of the Pattullo Gate Station, as will be described in section 5 of the Application;
- D. FEI also seeks BCUC approval under sections 59-61 of the UCA for a non-rate base deferral account, entitled the PGR Application and Development Costs, to capture the costs of preparing the Application and the preliminary stage development of the Project, including costs of assessing the feasibility of the Project, developing and evaluating preliminary design and alternatives;
 - E. FEI states that the Application and Development costs will be recorded in the proposed deferral account on a net-of-tax basis until January 31, 2020 attracting FEI's weighted average cost of capital (WACC) and will be transferred to rate base on January 1, 2021 with a three-year amortization period;
 - F. In the Application, FEI states that the PGR Project must be completed prior to the demolition of the Pattullo Bridge, which planned for the third quarter of 2023;
 - G. In order to meet the stringent PGR Project schedule requirements and support an expedited regulatory review, FEI states that it has filed the Application with the materials available at the time, and with a number of components incomplete, in order that the BCUC may commence the regulatory review process;
 - H. FEI states that the Application will be completed in one or more evidentiary updates, the content of which will depend on the results of FEI's ongoing consultation and negotiation with the City of Burnaby;
 - I. FEI states that it will file an evidentiary update at the end of September 2020 to either complete the Application or to update the BCUC on the status of its consultation and negotiation with the City of Burnaby, and advise when it will be able to complete the Application;
 - J. The BCUC has determined that a public hearing is appropriate to review the Application and that a public hearing process should be commenced, a regulatory timetable should be established and a public notice should be issued.

NOW THEREFORE the BCUC orders as follows:

1. A written hearing combined with a streamlined review process is established for the review of the Application. The Regulatory Timetable is set out in Appendix A to this order.
2. FEI is to publish the Public Notice by Friday, September 25, 2020, attached as Appendix B to this Order, in such local and community newspapers as to provide adequate notice to those parties who may have an interest in or be affected by the Application.
3. As soon as practicable, FEI is directed to publish, together with any supporting materials, the Application, this order and the Regulatory Timetable by using appropriate communication methods, including FEI's website and social media.

4. Interveners who wish to participate in the regulatory proceeding are to register with the BCUC by completing a Request to Intervene Form, available on the BCUC's website at <http://www.bcuc.com/Registration-Intervener-1.aspx> by the date established in the Regulatory Timetable attached as Appendix A to this order and in accordance with the BCUC's Rules of Practice and Procedure adopted by Order G-15-19.
5. Participants intending to apply for Participant Assistance/Cost Award (PACA) exceeding \$10,000 must file a completed PACA Budget Estimate form by Thursday, October 8, 2020. PACA applications should be consistent with the BCUC's PACA Guidelines and Order G-97-17. Copies of the PACA Guidelines are available upon request or can be downloaded from the BCUC's website at <http://www.bcuc.com>.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Attachment

FortisBC Energy Inc.
Application for Approval of a Certificate of Public Convenience and Necessity for the
Pattullo Gas Line Replacement Project
REGULATORY TIMETABLE

Action	Date (2020)
BCUC Issues Procedural Order by	Friday, September 11
FEI Publishes Notice by	Friday, September 25
FEI files its Evidentiary Update	Wednesday, September 30
Intervener Registration	Thursday, October 8
BCUC Information Request (IR) No. 1	Thursday, October 22
Intervener IR No. 1	Thursday, October 29
FEI Response to IR No. 1	Thursday, November 19
Streamline Review Process [subject to need for further evidentiary update]	Week of December 7
FEI Written Final Submission [subject to need for further evidentiary update]	Tuesday, December 22
Action	Date (2021)
Intervener Written Final Submissions [subject to need for further evidentiary update]	Thursday, January 7
FEI Written Reply Submission [subject to need for further evidentiary update]	Thursday January 21



bcuc
British Columbia
Utilities Commission

PUBLIC NOTICE

FortisBC Energy Inc. Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project

On August 31, 2020, FortisBC Energy Inc.(FEI) applied to the British Columbia Utilities Commission (BCUC) for approval of a Certificate of Public Convenience and Necessity (CPCN), pursuant to sections 45 and 46 of the *Utilities Commission Act* for its Pattullo Gas Line Replacement Project. The Project is needed to replace the distribution system capacity currently provided by FEI's distribution pressure gas line affixed to the Pattullo Bridge, which must be decommissioned in 2023 prior to the demolition of the Pattullo Bridge by the Province..

More information on the application can be found at bcuc.com on our "Current Proceedings" page, a hard copy of the application is also available for review at the BCUC's office and FEI's head office.

HOW TO PARTICIPATE

- Submit a letter of comment
- Register as an intervener

IMPORTANT DATES

1. **Thursday, October 8, 2020** – Deadline to register as an intervener or file a letter of comment with the BCUC.

For more information on how to participate, please visit our website (www.bcuc.com/get-involved) or contact us at the information below.

All submissions will be added to the public record and posted on the BCUC's website.

GET MORE INFORMATION

FortisBC Energy Inc. Regulatory Affairs



16705 Fraser Highway
Surrey, BC Canada V4N 0E8



E: gas.regulatory.affairs@fortisbc.com



P: 604.592.7664

British Columbia Utilities Commission



Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3



E: Commission.Secretary@bcuc.com



P: 604.660.4700



ORDER NUMBER

C-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Energy Inc.
Application for Approval of a Certificate of Public Convenience and Necessity for the
Pattullo Gas Line Replacement Project

BEFORE:

[Panel Chair]
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. On August 31, 2020, FortisBC Energy Inc. (FEI) submitted an Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application) to the British Columbia Utilities Commission (BCUC) pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA);
- B. In the Application, FEI states that the PGR Project is needed to replace the capacity currently provided by its gas line mounted on the Pattullo Bridge, which is being replaced and demolished as part of the Pattullo Bridge Replacement Project; FEI states that the PGR Project must be completed prior to the demolition of the Pattullo Bridge, which planned for the third quarter of 2023;
- C. In seeking a CPCN for the PGR Project, FEI requests approval to:
 - 1. Construct and install in the City of Burnaby a 508 mm gas line that will operate at a maximum operating pressure (MOP) of 2,070 kPa;
 - 2. Construct and install a new district pressure regulating station (PRS);
 - 3. Construct and install a 508 mm gas line that will operate at a MOP of 700 kPa to connect the PRS to the distribution system;
 - 4. Abandon and remove the existing Pattullo Gas Station in the City of Surrey and approximately 800 m of 508 mm gas line operating at a MOP of 700 kPa affixed to the existing Pattullo Bridge, as will be described in section 5 of the Application;

5. Abandon in place approximately 1.2 km of the remaining 508 mm gas line operating at a MOP of 700 kPa from the Pattullo Gate Station to the intersection of McBride Boulevard and Royal Avenue in Burnaby, as will be described in section 5 of the Application; and
 6. Modify approximately 5.5 km of the Livingstone-Pattullo 457 mm Transmission Pipeline and associated work due to the removal of the Pattullo Gate Station, as will be described in section 5 of the Application;
- D. FEI also seeks BCUC approval under sections 59-61 of the UCA for a non-rate base deferral account, entitled the PGR Application and Development Costs, to capture the costs of preparing the Application and the preliminary stage development of the Project, including costs of assessing the feasibility of the Project, developing and evaluating preliminary design and alternatives;
 - E. FEI states that the Application and Development costs will be recorded in the proposed deferral account on a net-of-tax basis until January 31, 2020 attracting FEI's weighted average cost of capital (WACC) and will be transferred to rate base on January 1, 2021 with a three-year amortization period;
 - F. The BCUC established a regulatory process for the review of the Application;
 - G. FEI completed its Application materials in an evidentiary update;
 - H. The BCUC has reviewed and considered the Application and other evidence, and the submissions filed in this proceeding, and determines that the requested approvals are necessary and in the public interest.

NOW THEREFORE pursuant to sections 45 to 46 and 59 to 61 of the *Utilities Commission Act* and for the reasons set out in the decision issued concurrently with this order, the British Columbia Utilities Commission orders as follows:

1. A CPCN is granted to FEI for the PGR Project and FEI is approved to:
 - a. Construct and install in the City of Burnaby a 508 mm gas line that will operate at a maximum operating pressure (MOP) of 2,070 kPa, as described in section 5 of the Application;
 - b. Construct and install a new district pressure regulating station (PRS), as described in section 5 of the Application;
 - c. Construct and install a 508 mm gas line that will operate at a MOP of 700 kPa to connect the PRS to the distribution system, as described in section 5 of the Application;
 - d. Abandon and remove the existing Pattullo Gas Station in the City of Surrey and approximately 800 m of 508 mm gas line operating at a MOP of 700 kPa affixed to the existing Pattullo Bridge, as described in section 5 of the Application;
 - e. Abandon in place approximately 1.2 km of the remaining 508 mm gas line operating at a MOP of 700 kPa from the Pattullo Gate Station to the intersection of McBride Boulevard and Royal Avenue in Burnaby, as described in section 5 of the Application; and
 - f. Modify approximately 5.5 km of the Livingstone-Pattullo 457 mm Transmission Pipeline and associated work due to the removal of the Pattullo Gate Station, as described in section 5 of the Application;

2. FEI is approved to establish the PGR Application and Development Costs deferral account to record the Application and preliminary stage development costs to be amortized over three years commencing January 1, 2021.
3. FEI must file semi-annual progress reports within 30 days of the end of each semi-annual reporting period, with the first report covering the period ending June 30, 2021.
4. FEI must file a Material Change Report in the event there is a material change to the PGR Project, explaining the reasons for the material change. FEI is to file the material change report as soon as practicable and in any event within 30 days of the date on which the material change occurs. If the material change occurs within 30 days of the date for filing a semi-annual progress report, FEI may include the material change information in the progress report.
5. FEI must file a Final Report, including a breakdown of the final costs of the PGR Project compared to the cost estimates and provide an explanation and justification for any material cost variances of 10 percent or more. The Final Report must be filed within six months of substantial completion or the in-service date of the PGR Project, whichever is earlier.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Attachment (Yes? No?)