



Diane Roy
Vice President, Regulatory Affairs

Gas Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 576-7349
Cell: (604) 908-2790
Fax: (604) 576-7074
www.fortisbc.com

November 19, 2020

Commercial Energy Consumers Association of British Columbia
c/o Owen Bird Law Corporation
P.O. Box 49130
Three Bentall Centre
2900 – 595 Burrard Street
Vancouver, BC
V7X 1J5

Attention: Mr. Christopher P. Weafer

Dear Mr. Weafer:

Re: FortisBC Energy Inc. (FEI)

Project No. 1599129

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

**Response to the Commercial Energy Consumers Association of British
Columbia (CEC) Information Request (IR) No. 1**

On August 31 2020, FEI filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-253-20 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to CEC IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 1

1 1. **Reference: Exhibit B-1, Cover Letter**

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.

1.1 Does FEI request the establishment of the deferral account prior to approval of the CPCN, or would these be provided at the same time?

Response:

Approval of the deferral account is not required in advance of the BCUC's decision on the CPCN. Please refer to the response to BCUC IR1 17.3.

1.2 If the deferral account is required in advance, please confirm that the establishment of a deferral account does not necessarily imply that the Commission will approve the requested CPCN.

Response:

Please refer to the response to CEC IR1 1.1.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 2

1 **2. Reference: Exhibit B-1, page 2 and page 3**

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

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.

2

3 2.1 Please describe how the Class 4 level of estimate differs from the Class 3.

4

5 **Response:**

6 The following response also addresses CEC IR1 3.2.

7 There are a number of characteristics used in assigning an AACE estimate class to a project
8 estimate. The primary characteristic is the maturity level of project definition deliverables which

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 3

1 ranges from a Class 5 estimate, with the lowest level of project definition, to a Class 1 estimate,
2 with the highest level of project definition. There are also a number of secondary characteristics
3 used in assigning an AACE estimate class, including the estimation methodology, expected
4 accuracy range, and preparation effort. Illustrating this, Table 1 below is from the American
5 Association of Cost Engineering (AACE) International Recommended Practice (RP) 17R-97:
6 *Cost Estimate Classification System*.

	Primary Characteristic	Secondary Characteristic			
ESTIMATE CLASS	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical +/- range relative to index of 1 (i.e. Class 1 estimate) [a]	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Screening or feasibility	Stochastic (factors and/or models) or judgment	4 to 20	1
Class 4	1% to 15%	Concept study or feasibility	Primarily stochastic	3 to 12	2 to 4
Class 3	10% to 40%	Budget authorization or control	Mixed but primarily stochastic	2 to 6	3 to 10
Class 2	30% to 75%	Control or bid/tender	Primarily deterministic	1 to 3	5 to 20
Class 1	65% to 100%	Check estimate or bid/tender	Deterministic	1	10 to 100

Notes:

[a] If the range index value of "1" represents +10/-5%, then an index value of 10 represents +100/-50% (at an 80% confidence interval).

[b] If the cost index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%.

Table 1 – Generic Cost Estimate Classification Matrix

7
8 FEI is utilizing AACE RP 97-18: *Cost Estimate Classification System – As Applied in*
9 *Engineering, Procurement, and Construction for the Pipeline Transportation Infrastructure*
10 *Industries* for the Project's primary characteristic ("Maturity level of project definition
11 deliverables"). The listing of General Project Data, Engineering and ROW deliverables are found
12 in Table 3 and reproduced as follows:

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 4

	ESTIMATE CLASSIFICATION				
	CLASS 5	CLASS 4	CLASS 3	CLASS 2	CLASS 1
MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data:					
Project Scope Description	Preliminary	Preliminary	Defined	Defined	Defined
Commodity Characteristics and Capacity	Preliminary	Preliminary	Defined	Defined	Defined
Station, Terminal and Tie-in Locations	Preliminary	Preliminary	Defined	Defined	Defined
Right-of Way (ROW) Strategy	Not Required	Preliminary	Defined	Defined	Defined
Soils, Hydrology, Subsea	Not Required	Preliminary	Defined	Defined	Defined
Integrated Project Plan	Not Required	Preliminary	Defined	Defined	Defined
Stakeholder Management Plan	Not Required	Preliminary	Defined	Defined	Defined
Stakeholder Consultation/Requirements	Not Required	Preliminary	Defined	Defined	Defined
Project Master Schedule	Not Required	Preliminary	Defined	Defined	Defined
Escalation Strategy	Not Required	Preliminary	Defined	Defined	Defined
Work Breakdown Structure	Not Required	Preliminary	Defined	Defined	Defined
Project Code of Accounts	Not Required	Preliminary	Defined	Defined	Defined
Procurement/Contracting Strategy	Not Required	Preliminary	Defined	Defined	Defined
Engineering and ROW Deliverables:					
Hydraulic Design	S	P	C	C	C
Route Mapping/Survey/Topography/Alignment Sheets	S/P	P/C	C	C	C
Land/ROW Title Negotiation	NR	S/P	P/C	C	C
Piping/Mechanical Discipline Drawings (including valving and pigging)	S	P	P	C	C
Instrumentation/Control and Monitoring/SCADA System Discipline Drawings	NR	S/P	P	C	C
Civil/Site Preparation/Structural Discipline Drawings	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	NR	S/P	P	C	C
Station/Terminal Interface Design	NR	S/P	P	C	C
Specifications and Datasheets	NR	S	P	C	C

Table 3 – Estimate Input Checklist and Maturity Matrix (Primary Classification Determinate)

1

2 **General Project Data:**

- 3 • **Not Required:** May not be required for all estimates of the specified class, but specific
4 project estimates may require at least preliminary development.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 5

- **Preliminary:** Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- **Defined:** Project definition is advanced and reviews have been conducted. Development may be near completion with the exception of final approvals.

Engineering and ROW Deliverables:

- **Not Required (NR):** Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- **Started (S):** Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- **Preliminary (P):** Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- **Complete (C):** The deliverable has been reviewed and approved as appropriate.

To improve the certainty of the cost estimate and schedule without incurring the delay associated with preparing a full class 3 estimate, FEI is completing additional activities to improve the maturity level of project definition deliverables beyond that of a typical AACE Class 4 cost estimate. These additional items include:

- General Project Data
 - Station, Terminal and Tie-in locations
 - Right-of-Way (ROW) Strategy
 - Stakeholder Consultation /Requirements
 - Procurement/Contracting Strategy
- Engineering and ROW Deliverables
 - Hydraulic Design
 - Crossings and Boring Design and Drawings
 - Specifications and Datasheets

2.2 Please provide further details as to why a Class 3 estimate cannot be undertaken.

Response:

Please refer to the response to BCUC IR1 15.1.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 6

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

2.3 What would be the additional cost of conducting a Class 3 estimate? Please quantify.

Response:

Please refer to FEI response to BCUC IR1 15.1.

2.4 Several of the component pieces of the CPCN application are identified as missing. Does FEI only expect to add these component pieces, or will FEI be providing further information to the existing pieces as well? Please explain.

Response:

FEI will provide all missing pieces and complete the CPCN Application in its evidentiary update. Also, as confirmed in the response to the BCUC IR1 13.1, FEI plans to update the alternative analysis provided in Section 4.4 of the Application with the Sperling Route Alternative 6D. In addition, FEI will update the Application as required to reflect any items that are identified during this round of information requests.

2.5 Please explain FEI's need to submit

Response:

FEI has confirmed with the CEC that this IR was intended to be deleted and no response is required.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 7

1 3. Reference: Exhibit B-1, page 4 and page 48

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.

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.

Table 4-6: Financial Evaluation Summary

	Alternative 6A: Broadway and Gagardi 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 Requirement ¹⁹ over 73 years (\$ millions)	125.8	190.0	171.5

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 8

3.1 Please confirm that the above analysis is based on a Class 5 estimate.

Response:

Confirmed, the cost estimates provided in Table 4-6 are based on AACE Class 5 estimates.

3.2 Please provide the characteristics of a Class 5 estimate as compared to a Class 3 and Class 4 estimate.

Response:

Please refer to the response to CEC IR1 2.1.

3.3 Please explain the differences in cost and timing that would be required for FEI to undertake a Class 3 estimate instead of the Class 4 estimate at this time.

Response:

Please refer to the responses to BCUC IR1 15.1 and 15.1.1 for the differences in cost and timing that would be required for FEI to undertake a Class 3 estimate versus a Class 4 estimate.

3.4 Please provide FEI's threshold for CPCNs.

Response:

In its Order G-165-20, the BCUC determined that the CPCN criteria during the five-year MRP term 2020 to 2024 will continue to be based solely on the dollar threshold set by Order G-120-15 and is therefore maintained at \$15 million.

3.5 Why did FEI use 73 years for the Project life?

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 9

Response:

The 73-year analysis period chosen for the financial analysis of the Project is based on a 70-year post-project analysis period plus three prior years for the construction scheduled from 2020 to 2022. The post-project 70 years is calculated using the approved depreciation rate of IP pipeline at 1.35 percent, as shown in the response to BCUC IR1 12.3 (i.e. $1/0.0135 = 74$ years, rounded down to 70 years). Upon further consideration, FEI believes that using the full depreciation rates (i.e., 74 years) for the post-project analysis period (or 77 years including pre- and post-project period) is more appropriate as it reflects the full recovery of the initial Project capital costs through depreciation expense embedded in the revenue requirement. While this change is immaterial with respect to the levelized rate impact, FEI will update the financial analysis period to 77 years in its evidentiary update to be filed on December 15, 2020.

3.6 Please provide the discount rate used for the PV calculations and an explanation for selecting the subject discount rate.

Response:

The discount rate used for the present value (PV) calculations of the incremental revenue requirement in Table 4-6 of the Application is 5.47 percent, which is FEI's after tax weighted average cost of capital (WACC) for 2020 as per FEI's Annual Review for 2020 and 2021 Rates, filed with the BCUC on August 12, 2020. Upon further consideration, FEI believes using the 2021 forecast after tax WACC as per FEI's Annual Review for 2020 and 2021 Rates are more appropriate to estimate FEI's average financing costs for the Project since the majority of the capital costs for the Project will not begin until 2021. FEI will update the financial analysis using the forecast 2021 after tax WACC in its evidentiary update to be filed on December 15, 2020. FEI notes that the change is immaterial to the financial analysis as shown in Table 4-6 of the Application since the forecast 2021 after tax WACC is also 5.47 percent, when rounded to two decimal places.

Using FEI's WACC as the discount rate for financial analysis is consistent with past CPCN applications approved by BCUC. WACC is the average financing cost for FEI and represents FEI's allowed rate of return; as such, it is appropriate to use WACC in the financial analysis for FEI's projects.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 10

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

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

3.7 Please confirm or otherwise explain that loss of the Pattullo Gas Line would not immediately result in a loss of gas supply to 10,700 customers, but would instead be a risk under design day conditions.

Response:

Confirmed. There are times of the year, outside of the winter period, that the Pattullo Gas Line can be taken out of service. FEI estimates that in 2023 during weather colder than a 28 degree day (DD), i.e. minus 10°C, the trunk distribution system could not supply the demand requirements of customers without the Pattullo Gas Line in service. At temperatures colder than 24DD (i.e., minus 6°C) the stations begin to operate outside the FEI design limits for safe and reliable operations. Based on FEI's extreme value analysis of historical weather recorded at the Vancouver International Airport, in any year there is a 43 percent chance of a 24DD or colder occurring and an 11 percent chance of a 28DD or colder occurring.

3.8 Please provide a quantitative assessment of the risk of the conditions occurring that would lead to having 10,700 customers without access to natural gas.

Response:

Please refer to the response to CEC IR1 3.7.

3.9 Please provide a breakdown of the 35,000 customers by rate class, and provide volumes by month over the last two years for each customer class.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 11

Response:

The table below provides a breakdown by customer Rate Schedule (RS) and provides monthly consumption for the 2018 and 2019 calendar years. To avoid revealing consumption information related to any single customer, or small group of customers, consumption for RS 4, RS 5 and RS 7, and for RS 22, RS 25 and RS 27 have been combined.

Year	Month	Consumption by Rate Schedule (TJ)					
		1	2	3	4,5,7	23	22,25,27
2018	Jan	425.5	191.9	216.5	44.7	71.4	92.9
	Feb	397.0	174.2	205.0	41.2	68.1	87.0
	Mar	361.1	158.9	198.1	38.5	62.0	87.4
	Apr	235.0	106.2	151.5	30.5	46.7	75.2
	May	121.0	59.9	99.3	19.0	26.0	60.7
	Jun	93.4	45.1	79.2	18.3	23.3	67.7
	Jul	77.0	38.0	65.9	14.3	16.5	51.1
	Aug	74.4	37.4	62.0	13.7	15.8	51.1
	Sep	113.9	55.5	89.3	17.4	24.5	62.9
	Oct	195.0	88.5	130.1	25.6	38.4	69.9
	Nov	306.0	137.4	173.6	34.5	48.0	77.6
	Dec	399.3	176.6	210.7	42.5	61.5	102.2
2019	Jan	431.0	191.0	227.5	42.0	59.4	94.7
	Feb	441.4	193.0	226.4	45.3	68.2	89.8
	Mar	324.2	149.0	190.9	35.3	50.8	80.0
	Apr	201.7	94.4	138.9	28.8	38.2	69.7
	May	127.4	62.7	102.3	20.0	24.2	64.9
	Jun	87.1	44.0	75.2	17.4	18.6	51.9
	Jul	78.5	39.8	67.3	15.7	16.2	58.3
	Aug	74.1	37.4	63.2	14.4	14.7	52.8
	Sep	117.3	55.2	85.9	19.0	21.5	68.0
	Oct	246.8	110.3	150.1	33.6	43.6	96.0
	Nov	330.6	147.0	210.2	86.0	25.8	38.7
	Dec	409.1	182.0	248.2	103.6	30.9	38.7

3.10 What actions would FEI normally undertake if there were a significant rupture at such a location which could not be quickly repaired? Are there other temporary means of getting gas supply to these customers? How would such customers be affected?

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 12

1 **Response:**

2 FEI provides below a summary of the actions it would normally take following a significant
3 rupture within the distribution system in a location that could not be quickly repaired, broken
4 down into actions undertaken immediately following an event and those required to restore
5 supply.

6 ***FEI actions immediately following an event:***

7 In response to a significant event like a rupture, FEI would first ensure safety and mitigate any
8 potential harm to the general public, FEI responders and other emergency services. FEI crews
9 would assess the situation for dangerous accumulating or migrating gas and take immediate
10 actions to control or safely vent escaping gas. With the assistance of fire and police
11 responders, all non-essential personnel would be evacuated from the area and an isolation
12 perimeter would be established to control re-entry. FEI would communicate with and support
13 other emergency services in establishing an incident command centre at an appropriate
14 location.

15 The overall incident response would be coordinated through the corporate Emergency
16 Operations Centre (EOC), located at FEI's Surrey Operations Centre. FEI would assess the
17 performance of the distribution system to determine if the rupture precipitated an immediate loss
18 of supply to customers. This would be accomplished by remote telemetry, manual checks with
19 on-site personnel, or a combination of both. Any customers identified as having lost pressure,
20 and consequently gas supply, during the incident would be isolated at the meter set until gas
21 supply can be re-established. Concurrently, coordinated by the EOC, FEI would determine a
22 means of isolating and limiting the impacts of the incident on the distribution system based on
23 both the current system demand, and the expected system demand based on forecasted
24 weather conditions. Any customers within the isolated area would lose gas supply. By using
25 hydraulic modelling tools, FEI would also identify areas outside of the isolated area where gas
26 supply to customers might be disrupted as a result of the isolation.

27 ***FEI actions to restore supply:***

28 FEI has two options to manage and mitigate gas supply to customers during an incident: 1)
29 secure an alternate supply to meet the expected customer demand, or 2) shed or manage
30 customer load to meet the gas supply capability of the compromised system.

31 In analysis of such an emergency situation, FEI would first curtail any customers with
32 interruptible rate schedules within the affected area. This curtailment generally occurs fairly
33 quickly once identified and communicated. On the supply side, FEI has the capability to supply
34 CNG and LNG in limited quantities that, depending on the severity of the weather, could support
35 several dozen to a few hundred customers for short periods. With sufficient lead time, larger
36 units capable of supporting several hundred to a thousand customers (again depending on the
37 severity of the weather) might be available from other providers, but would require time for
38 procurement and delivery. If a supply such as CNG or LNG were sufficient to mitigate the supply

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 13

1 concerns, customers in the affected region would likely not be impacted or notice the replaced
2 supply.

3 In the event that the temporary gas supply and/or curtailment of interruptible customers was
4 insufficient, FEI would curtail firm customers. As a last resort, FEI would shed load by isolating
5 portions of the distribution system using available valves. The objective would be to isolate the
6 smallest number of customers necessary to secure a reliable and stable gas supply for the
7 remaining customers and to avoid more widespread outages. Isolation of the distribution
8 system to shed load can be complex and logistically challenging as it typically requires FEI
9 personnel to manually operate multiple valves, widely separated, and located in city streets.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 14

1 **4. Reference: Exhibit B-1 page 4**

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.

2

3 4.1 Please provide the coldest day customer demands for capacity quantified from
4 the Pattullo Gas Line for the last 20 years versus capacity.

5

6 **Response:**

7 FEI does not have flow data archived and available prior to 2007 for the Pattullo Gas Line. The
8 following table shows the historical actual peak flow in the Pattullo Gas Line on the coldest day
9 of each available year (from the 2007-2008 winter).

10 Please refer to the response to BCUC IR1 3.1 for a discussion of the capacity of the Pattullo
11 Gas Line.

12 For illustrative purposes, the table provides a comparison to the estimated peak day flow in the
13 Pattullo Gas Line expected in 2020.

Winter	Coldest Day	Mean daily Temperature (°C)	Peak hourly Pattullo Gas Line Demand (m³/hr.)	Estimated 2020 Peak Day Demand (m³/hr.)
2007-08	1-Dec-07	-1.2	54,050	86,060
2008-09	20-Dec-08	-10.3	63,340	
2009-10	19-Dec-09	-2.8	58,080	
2010-11	23-Nov-10	-6.4	42,190	
2011-12	18-Jan-12	-5.7	69,910	
2012-13	13-Jan-13	-2.8	52,830	
2013-14	7-Dec-13	-5.9	58,540	
2014-15	30-Nov-14	-4.5	56,190	
2015-16	2-Jan-16	-2	45,920	
2017-18	21-Feb-18	-3.4	53,800	
2018-19	10-Feb-19	-5.2	54,510	
2019-20	14-Jan-20	-7.1	60,900	

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 15

1

2

3

4 4.2 Please provide the design coldest day used applicable for the Pattullo Gas Line
5 and/or system-side.

6

7 **Response:**

8 The design coldest day or Design Degree Day (DD) for the Metro Vancouver region is 30.2DD.

9 This is equivalent to a mean daily temperature of minus 12.2°C as reported at the Vancouver

10 International Airport.

11

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 16

5. Reference: Exhibit B-1 page 16-17

5.1 Please provide average volumes for each of the four distribution points by month.

Response:

FEI measures and records pressure at each of the four distribution points, but does not measure accumulated gas volumes at three of the four distribution points. FEI is therefore not able to provide a complete response. Accumulated volumes for the Pattullo Gas Line at Pattullo Gate are available. The table below shows the monthly volumes through the Pattullo Gas Line for 2018 and 2019 and the average monthly volume for each month over those two years.

Monthly Volumes Through the Pattullo Gas Line (10³m³)

Month	2018	2019	Average
Jan	21,614	23,946	22,780
Feb	21,217	27,067	24,142
Mar	17,348	22,820	20,084
Apr	10,574	14,599	12,586
May	286	2,433	1,360
Jun	112	617	364
Jul	0	1,165	582
Aug	0	12	6
Sep	190	1,946	1,068
Oct	8,376	22,692	15,534
Nov	18,995	19,084	19,039
Dec	24,486	22,035	23,260

5.2 Please provide a graph showing peak capacities for each of the four distribution points by month.

Response:

Capacity is not a unique value that can be attributed to a point in distribution system, rather it is a property of the larger system reflecting how distribution points and delivery requirements interact as a whole. The capacity of a system does not vary by month. Please refer to the response to BCUC IR1 3.1 for a discussion and example of how capacity may be determined for a system.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 17

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

5.3 Please provide a graph showing the past 2 year volumes and forecast volumes for the Pattullo Gas Line.

Response:

Please refer to the response to CEC IR1 5.1 for the gas flow volumes for the Pattullo Gas Line in 2018 and 2019. FEI does not forecast yearly, monthly or daily volumes of gas flowing through individual segments located within any distribution system and so is unable to provide the requested graph.

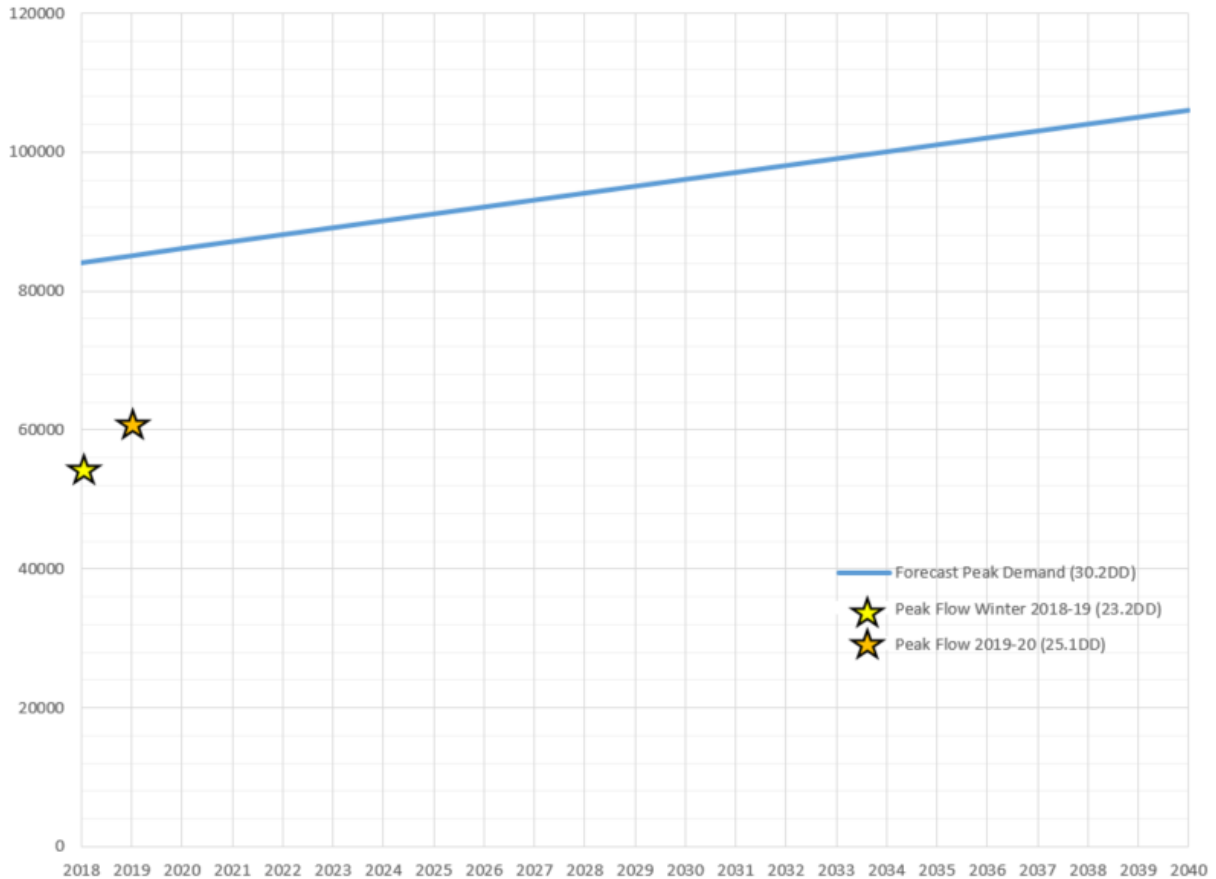
5.4 Please provide a graph showing the past 2 year peaks and forecast peak demand projection over time for the Pattullo Gas Line.

Response:

The graph below shows the forecasted peak demand expected for the Pattullo Gas Line over the next 20 years. Also shown is the measured flow over the Pattullo Gas Line on the coldest day in the winter of 2018-19 and the winter of 2019-20.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 18

Forecast Peak Demand 30.2DD - Pattullo Gas Line
(m³/hr.)



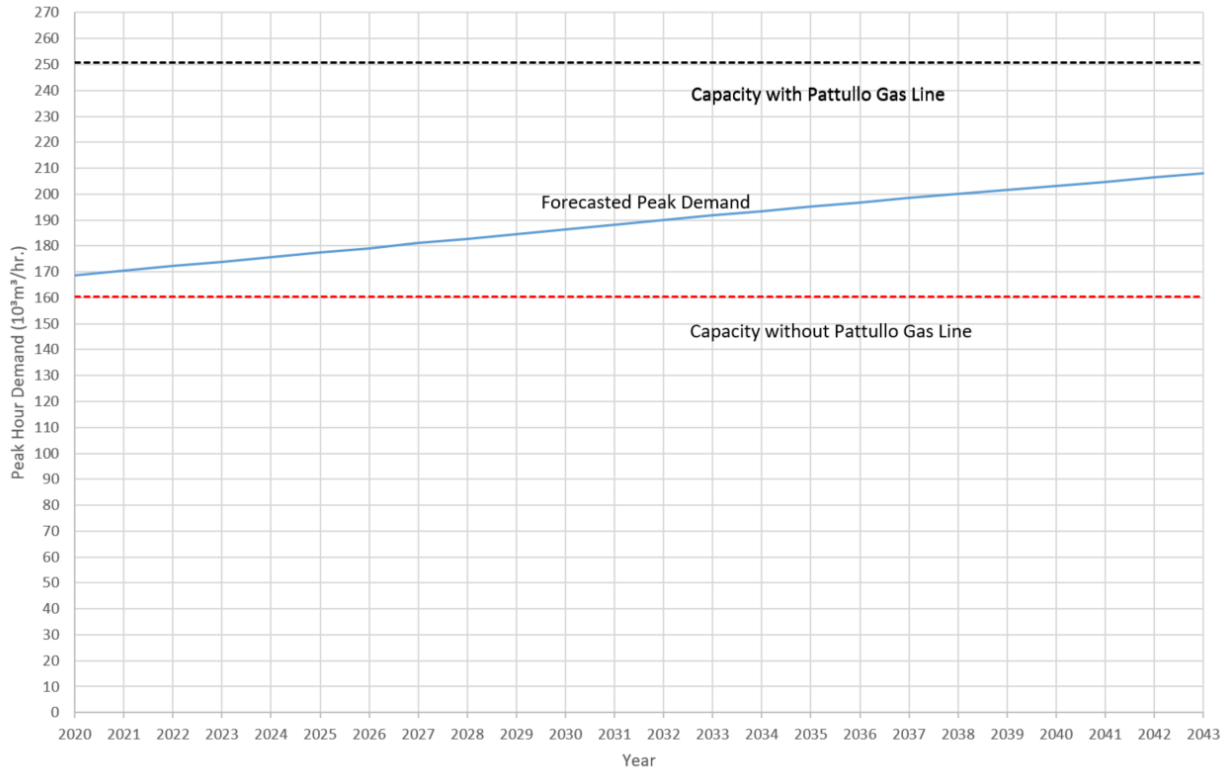
5.5 Please illustrate graphically the area's peak demand and the available supply both with and without the Pattullo Gas Line.

Response:

The following figure provides peak demand and available capacity, both with and without the Pattullo Gas Line, over a 23 year period to 2043. Also, please refer to the information provided in the responses to BCUC IR1 3.1 and 4.1.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 19

Peak Demand Forecast to 2043
Metro DP 700 Trunk Distribution System
served by Pattullo Gas Line



1
2
3
4
5
6
7
8
9
10
11
12
13

5.6 Please provide a breakdown of the 10,700 customers that would be affected by rate class; and provide the volumes for each affected customer group over the last 10 years.

Response:

The table below provides the 2010 through 2019 annual consumption by Rate Schedule for affected customers. Similar to the information provided in the response to CEC IR1 3.9, to avoid revealing consumption information related to any single customer, or small group of customers, consumption for RS 4, RS 5 and RS 7, and for RS 25 and RS 27 have been combined.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 20

Year	Consumption by Rate Schedule (TJ)					
	1	2	3	4,5,7	23	25,27
2010	743.6	428.6	612.1	157.1	211.1	424.5
2011	835.9	484.5	644.1	148.9	254.7	458.8
2012	794.6	481.4	632.6	125.5	268.8	473.4
2013	770.9	474.6	590.8	122.6	279.7	459.6
2014	735.7	468.8	556.4	117.2	265.0	438.4
2015	665.5	434.9	519.2	111.6	235.6	420.9
2016	709.0	468.2	540.5	125.5	250.7	422.1
2017	822.6	529.4	616.0	137.2	270.1	464.0
2018	757.4	491.5	626.7	135.2	226.7	427.0
2019	778.8	494.6	688.9	198.4	172.9	374.3

1

2

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commerical Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 21

1 6. **Exhibit B-1, page 18 and 19**

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

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.

6.1 Please provide a brief summary description of the LMIPSU Project.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 22

1 **Response:**

2 The LMIPSU Project¹ was comprised of two stand-alone projects, the Coquitlam Gate IP project
3 and the Fraser Gate IP project.

4 A brief summary description of the Coquitlam Gate IP project is as follows:

5 ***Project Driver:***

6 The existing 1958-vintage NPS 20 pipeline is nearing the end of its expected service life
7 as evidenced by the increasing frequency of gas leaks resulting from non-preventable
8 active corrosion beneath disbonded field-applied coating at girth welds. The need to
9 replace the existing pipeline also provides a cost effective opportunity to restore
10 operational flexibility and resiliency to the Metro Vancouver IP system through an
11 increase in pipeline capacity in the Coquitlam Gate IP pipeline.

12 ***Scope:***

- 13 • The replacement of approximately 20 kilometers of an existing NPS 20 IP
14 pipeline operating at 1200 kPa with a new NPS 30 IP pipeline operating at 2070
15 kPa;
- 16 • Upgrades to the existing Coquitlam Gate station to facilitate the larger IP pipeline
17 flow capacity and operating pressure;
- 18 • Upgrades to East 2nd and Woodland Station to interface the new NPS 30 pipeline
19 with the existing Fraser Gate IP network; and
- 20 • Interface with the existing IP network at a number of supply offtakes en-route
21 from Coquitlam through Burnaby to the terminus at East 2nd & Woodland in
22 Vancouver.

23
24 A brief summary description of the Fraser Gate IP project is as follows:

25 ***Project driver:***

26 The existing NPS 30 pipeline is vulnerable to failure due to a less than 1 in 2475 year
27 seismic event.

28 ***Scope:***

- 29 • The replacement of approximately 280 meters of an existing NPS 30 IP pipeline.

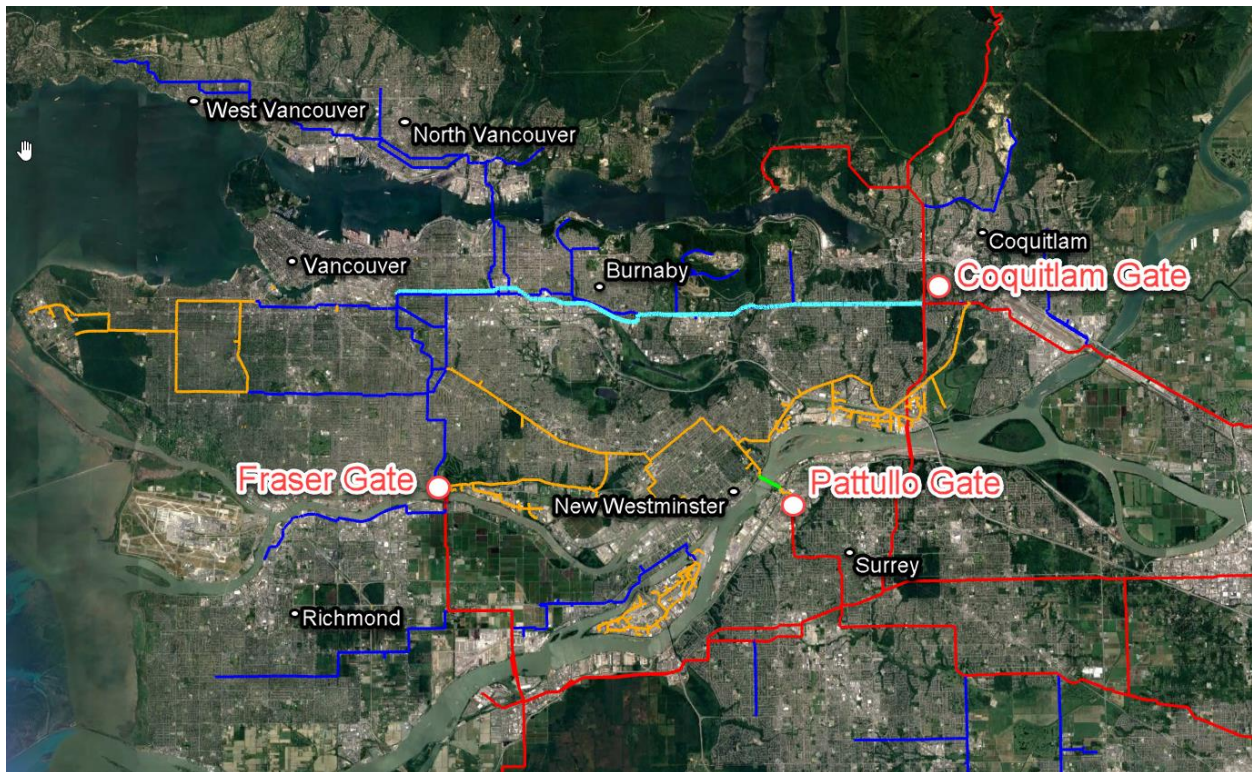
¹ BCUC Decision and Order C-11-15, dated October 16, 2015. Online:
https://www.bcuc.com/Documents/Proceedings/2015/DOC_44883_10-16-2015_FEI-LMIPSU-CPCN-Decision.pdf.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 23

6.2 Please indicate on Figure 3-3 where the LMIPSU pipeline is established.

Response:

As part of the LMIPSU Project, FEI replaced approximately 20 km of existing NPS 20 intermediate pressure (IP) gas line with NPS 30 IP gas line as shown in turquoise in the figure below.



6.3 Was the Pattullo Gate identified as crucial in maintaining resiliency in the LMIPSU CPCN proceeding? Please explain and provide references to where it was considered in the application.

6.3.1 If yes, did FEI consider the possibility of the current situation arising at the time of the LMIPSU Project?

6.3.1.1 If yes, what actions did FEI take to prepare for and/or mitigate the current situation in the LMIPSU Project? Please explain.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 24

6.3.2 If no, why not?

Response:

The replacement of the Pattullo Gas Line was not a consideration in the LMIPSU CPCN proceeding with respect to resiliency. The level of resiliency discussed in the LMIPSU CPCN application was based on the Pattullo Gas Line remaining in the current location and at the time of the proceeding, FEI was not aware that a new gas line would not be permitted to be attached to the New Bridge.

The LMIPSU CPCN application was approved by the BCUC in October 2015. The first official communication from TransLink to FEI regarding the removal of the Pattullo Gas Line crossing as part of the Pattullo Bridge Replacement was received in May 2017, after the detailed design for the LMIPSU was completed. The first official communication from MoTI to FEI that a replacement gas line would not be permitted on the New Bridge was received in July 2018 (see Appendix A-1 of the Application).

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 25

1 **7. Exhibit B-1, page 22**

**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.

2

3 7.1 Please provide FEI's definition of 'resiliency'

4

5 **Response:**

6 Please refer to the response to BCUC IR1 5.1.

7

8

9

10 7.2 Please explain quantitatively how Metro Vancouver's resiliency would be
11 affected.

12

13 **Response:**

14 Please refer to the responses to BCUC IR1 11.4 and 11.6.

15

16

17

18 7.3 Please provide quantitative probabilities for the loss of gas supply from either
19 Coquitlam Gate or Fraser Gate station.

20

21 **Response:**

22 FEI is unable to provide quantitative probabilities for the loss of gas supply from either
23 Coquitlam Gate or Fraser Gate station. The available sample set for complete station failures
24 within the FEI system is very small, and hence it is not possible to draw inferences from this
25 information.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commerical Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 26

- 1 Unplanned gas supply interruptions to gate stations are low probability but potentially high
- 2 consequence events. Such events can occur, and could result in long-duration outages to large
- 3 numbers of customers.
- 4

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 27

8. **February 16, 2018 News Release and Partnerships BC website, and Exhibit B-1, page 23**

<https://news.gov.bc.ca/releases/2018TRAN0022-000223>

Pattullo Bridge replacement will improve safety and create good jobs

<https://www.partnershipsbcc.ca/projects/projects-under-construction/pattullo-bridge-replacement-project/>

Milestones

Request for Qualifications issued	July 16, 2018
Request for Qualifications closed	September 2018
Shortlist announced	February 14, 2019
Request for Proposals issued	October 4, 2019
Contract award	February 7, 2020
Construction to begin	2020
Construction completed	

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.

8.1 FEI has taken at least 2 years to provide a CPCN application since the Request for Qualifications was issued. Additionally, the need for a new bridge has been identified for some time. Did FEI undertake ongoing assessments of how it could respond in the event that it needed to replace this route? Please explain.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 28

1 **Response:**

2 Upon notification from TransLink in June 2017 that the Pattullo Bridge was being replaced, FEI
3 conducted high-level assessments of multiple alternatives as part of its initial planning process
4 to identify which alternatives would be feasible from a cost, schedule, stakeholder and technical
5 perspective. FEI's initial assessment concluded that Alternative 1 (Attachment to the New
6 Bridge) had the lowest cost and least stakeholder impacts and informed the MoTI in writing of
7 this assessment in January 2018. FEI subsequently made numerous attempts to meet with the
8 MoTI to discuss the same. Please refer also to the response to BCOAPO IR1 5.1 for further
9 information regarding FEI's communications with the MoTI.

10 In parallel, FEI continued to investigate all other alternatives listed in the Application, and in late
11 2018 FEI focused on the next lowest cost and next least impactful option, Alternative 2
12 (Trenchless Crossing of the Fraser River). Once the MoTI verbally confirmed in January 2020
13 that Alternative 1 would not be approved and FEI determined that Alternative 2 was not feasible,
14 FEI immediately proceeded to evaluate the overland route options, collectively termed
15 Alternative 6. The evaluation concluded that Alternative 6C (Fraser Gate Corridor) was the
16 preferred alternative, before the City of Burnaby introduced Alternative 6D (Sperling Avenue
17 Corridor).

18
19

20

21 8.2 Please describe any other options that FEI could have considered if it had earlier
22 information? Please explain.

23

24 **Response:**

25 Section 4 of the Application describes all the potential alternatives to the Project. There are no
26 other options that FEI could have considered if it had earlier information.

27

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commerical Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 29

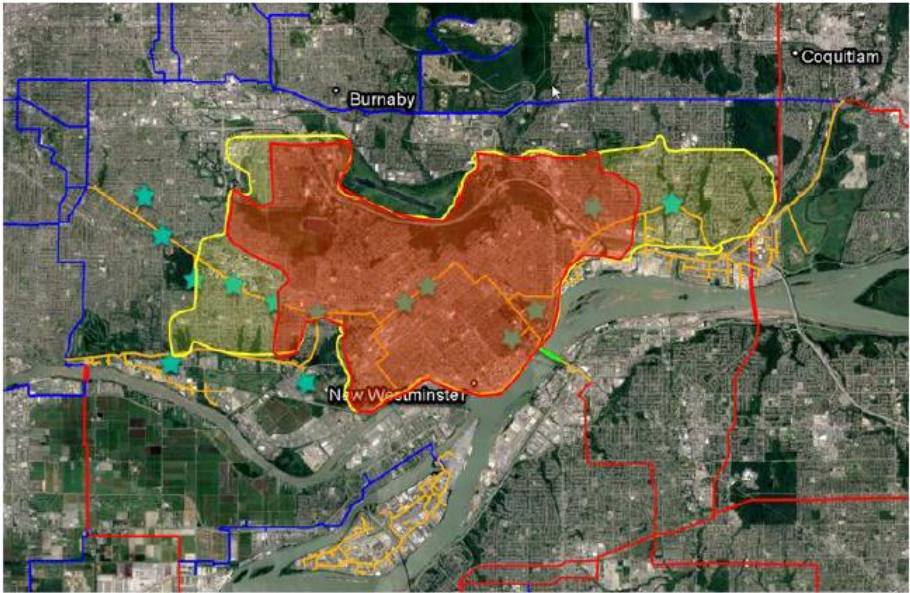
1 **9. Exhibit B-1, page 19 and page 21**

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.

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.

- 2
- 3 9.1 If the pipeline were degasified, and properly abandoned in accordance with the
- 4 MoTI schedule, could the construction of the replacement be deferred for any
- 5 period? Please explain why or why not.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 30

9.1.1 If yes, for how long could the construction be reasonably deferred?
Please explain and provide any quantitative measure of risk available.

Response:

Please refer to the response to BCUC IR1 10.3.

9.1.2 Please provide an assessment of the impacts for customers if there was
delay in the provision of the replacement. Over what duration might
customers likely experience a loss of gas?

Response:

The conditions and likelihood of occurrence of customer impacts are discussed in the response
to CEC IR1 3.7. Further, as described in the response to CEC IR1 3.10, when situations arise
where the gas system has experienced a loss of pressure which could lead to the misoperation
of gas appliances, FEI would isolate the affected system to ensure public safety until a reliable
gas supply were re-established.

Although the conditions producing low pressure and misoperation of appliances may only be
present for a few hours during periods of highest demand, once the customer supply is isolated
the restoration of service will take considerably longer. For outages to thousands of customers,
the recovery could span several weeks. The restoration process would require each premise to
be visited at least twice during that period: once to isolate the customer meter set, and once to
restore gas service and relight customer appliances. If weather conditions persist that would
cause low system pressure conditions to recur, FEI would delay service restoration until the
weather forecast abated sufficiently to ensure adequate system pressures. During this period,
from the loss of supply until service restoration, residential and commercial customers would be
without gas for space heating, hot water, and cooking during extreme cold winter conditions.

9.2 Please confirm that existing customers would not necessarily be immediately
affected, or without natural gas, except under specific circumstances.

Response:

Please refer to the response to CEC IR1 3.7.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 31

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37

9.2.1 Please elaborate, quantitatively, on the specific circumstances that would need to occur for certain customers to be without natural gas.

Response:

Please refer to the response to CEC IR1 9.1.2.

9.3 Please elaborate on the forecasting that results in an additional 14,800 customers being without natural gas. Do the ‘additional 14,800 customers’ represent existing customers that would be affected as a result of increased capacity constraints on the system from higher usage, or do they include new customers? Please explain and provide quantification of the factors resulting in the increase in customers that will be affected.

Response:

Reference to the “additional 14,800 customers” in the Application represents existing customers that currently receive service and is an approximation of the potential number of customers that would have inadequate gas supply by 2039 due to the loss of the Pattullo Gas Line. Because of the expected increase in demand between 2020 and 2039, without the replacement of the Pattullo Gas Line, FEI estimates that the number of stations experiencing inadequate inlet pressure to meet the demand would grow from three district stations to seven district stations. The additional 14,800 customers currently served by the four additional district stations that FEI estimates would experience inadequate inlet pressure.

FEI expects that there will also be customer additions between 2020 and 2039. The increased demand attributed to customer additions has been included in the forecast demand for the trunk distribution system; however, FEI did not estimate the customer additions in the expanded area that would be impacted by the loss of the Pattullo Gas Line. FEI does not consider it material to have the exact number of customers that would be impacted by 2039; rather, it is sufficient that the number of customers that would be impacted by inadequate gas supply would be in the tens of thousands.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 32

9.3.1 If the increase is a result of increasing peak demand, is it relevant where the demand occurs on the system? Please explain why or why not.

Response:

The increase in capacity constraints on the system is not the result of increasing peak demand, as explained in the response to CEC IR1 9.3.

9.4 Please provide a breakdown of the customers that would be affected in the future by rate class; including the number of customers and volume for each.

Response:

FEI is unable to provide the requested information because the utility's forecasting and planning methodology considers account growth in municipalities as a whole. Therefore, while FEI is able to describe the increased load and the general region served by stations that might also be impacted by future load in a system without the Pattullo Gas Line, it does not have a means to provide a specific breakdown of future customers by rate class or future consumption volumes within the portions of Burnaby, New Westminster Coquitlam that lie within the affected area.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 33

1 **10. Exhibit B-1, page 23**

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.

2

3 10.1 Are there alternatives considered which would provide an appropriate solution,
4 but could not be constructed and implemented prior to the time of
5 decommissioning, or are these all identified in this application? Please explain.

6

7 **Response:**

8 FEI confirms that it has appropriately identified and considered all alternatives within its
9 Application to replace the system capacity provided by the Pattullo Gas Line, including those
10 that could not be constructed and implemented prior to the time of decommissioning of the
11 existing Pattullo Bridge.

12

13

14

15

16 10.1.1 Please identify any other alternatives and provide a brief analysis of the
17 total costs and benefits of each.

18

19 **Response:**

20 Please refer to the response to CEC IR1 10.1.

21

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 34

1 **11. Exhibit B-1, page 29 and page 33**

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

4.3.2.3.1 ANALYSIS OF ALTERNATIVE 2C

The footprint of this alternative is fully contained within the Pattullo Bridge Replacement Project footprint (refer to bolded and yellow areas in Figure 4-5), and therefore would have required coordination between FEI and the design build contractor for the Pattullo Bridge Replacement Project. However, as this alternative was identified during MoTI's competitive bidding process, FEI's requirements could not have been incorporated in the scope of the Pattullo Bridge Replacement Project without change orders being put to MoTI, for which MoTI indicated they would not be responsible. FEI determined this alternative was not feasible due to the compounding impacts of the following challenges:

- Added complexity with project coordination for workspace requirements and access points for both FEI's project and the Pattullo Bridge Replacement Project;
 - The MoTI Design Build Finance (DBF) contract limits FEI's ability to negotiate coordination with the Pattullo Bridge Replacement Project, as FEI's project requirements were not incorporated in their original scope;
 - The close proximity of the crossing to the New Bridge alignment creates design and construction risks as location and size of bridge pier foundations would not be available prior to detailed design of the HDD;
 - Impact on a known archaeological site – the indigenous village site in the City of Surrey;
-
- 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.

2

3 11.1 FEI identified certain alternatives that were dismissed because of timing. If FEI
4 had presented this or any alternative at an earlier stage in the proceedings, could
5 any of these alternatives have been incorporated? Please explain.

6 11.1.1 If yes, when would FEI have needed to present this alternative to the
7 MoTI for inclusion?

8 11.1.2 Please provide a brief summary of the pros and cons of these
9 alternatives. Would there have been a possible superior alternative to
10 that being proposed? Please explain.

11

12

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 35

1 **Response:**

2 To clarify, no alternatives were dismissed solely “because of timing”. For example, as cited in
3 the preamble, Alternative 2C was not determined to be feasible due to the compounding
4 impacts of a number of challenges, only one of which was timing-related.

5 In order to be responsive to CEC’s request, FEI speculates that had it further developed a
6 horizontal directional drilling (HDD) alternative prior to the MoTI starting their competitive
7 bidding process, it is possible some of the above-noted challenges could have been addressed
8 through early engagement with the MoTI regarding workspace requirements and access, bridge
9 alignment and foundation design and compounding schedule effects. However, inherent design
10 and construction risks would have remained and it is uncertain that all technical and
11 coordination challenges associated with the HDD and its construction in a congested area could
12 have been adequately resolved with additional time. Further, the possibility of a repeated HDD
13 failure, reflecting the location’s uncertain geological profile, could not be mitigated with
14 additional time. Regardless of any potential pros of dismissed alternatives, they are not feasible
15 due to compounding impacts as discussed in Section 4.3 of the Application.

16

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 36

1 **12. Exhibit B-1, pages 37- 38**

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



2

1 **4.3.4.1 Analysis of Alternative 4**

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

- 5 1. Due to the high impact structural requirements of an aerial crossing of the Fraser River,
6 there are several long lead-time permits required for in-river geotechnical investigations
7 and for the construction phase. Several of the identified permits must be filed
8 sequentially with approval prior to design activities followed by construction start. This
9 long lead-time permitting process prevents this alternative from meeting the project
10 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
- 11 2. The proximity in both time and location to MoTI's Pattullo Bridge Replacement Project
12 would result in challenges associated with cumulative effects of the two projects. It is
13 likely that the Cities of Surrey and New Westminster, Indigenous communities and the
14 public would take an increased interest in an aerial gas line crossing due to the visual
15 impact, and perceived fisheries or watercourse impacts. As a result, FEI does not expect
16 that it could complete the stakeholder engagement and consultation process in time to
17 meet Project schedule requirements.

3

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 37

12.1 What, approximately, could be the final in service date if this option were to be selected?

Response:

Consistent with AACE RP 27R-03 Schedule Classification System, a schedule for Alternative 4 was completed at a semi-detailed level which concluded that it would not have met the Pattullo Bridge Replacement project timelines. Please also refer to the response to Burnaby IR1 11.1.

12.2 Excluding the issue of time frame, please provide a brief analysis of this option including an order of magnitude NPV, and costs and benefits.

Response:

FEI is unable to provide a brief analysis of Alternative 4 because it has not constructed an aerial crossing of similar scope and complexity as the one contemplated for Alternative 4 crossing the Fraser River. As such, FEI has no historical cost data as a basis to develop a high-level cost estimate for Alternative 4.

12.3 Please compare and contrast this alternative quantitatively with the proposed option.

Response:

FEI has assumed that the “proposed option” is in reference to Alternative 6A (Broadway and Gagliardi Way Corridor). As discussed in Section 4.4.3 of the Application, FEI plans to file the remainder of its alternatives analysis, including its determination regarding the preferred route for the Project, in its evidentiary update.

As explained further in Section 4.3.4.1, FEI screened out Alternative 4 and determined that it was not feasible. FEI is unable to quantitatively compare and contrast Alternative 4 with Alternative 6A because this alternative was not considered further as part of the evaluation process.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commerical Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 38

1 **13. Exhibit B-1, page 39**

2 **4.3.5.1 Alternative 5A – LNG**

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

11 **4.3.5.1.1 ANALYSIS OF ALTERNATIVE 5A**

12 During peak demand, four LNG trailers per hour would be required to supply the required load
13 via a virtual gas line. Any interruption in the delivery and injection of LNG, such as traffic
14 disruption between Tilbury LNG and the injection point in New Westminster, could result in the
15 loss of pressure in the system and significant customer outages. Therefore, this solution is not
16 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.

13.1 Please provide an order of magnitude assessment of the NPV of such a project
relative to the existing proposal.

Response:

FEI is unable to provide an order of magnitude assessment of the NPV for Alternative 5A, as
there is insufficient information on which to base such an estimate. Notwithstanding this, for
illustrative purposes, FEI notes that the capital cost alone of the recently completed Tilbury
Expansion Project² was approximately \$495 million.

13.2 Please provide a brief discussion of the timeline issues, with quantification, that
precludes the use of this option.

² The Tilbury Expansion Project was a brownfield expansion of the existing Tilbury site which added 33 MMcf/day of liquefaction and 1 Bcf of LNG storage capacity.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 39

1 **Response:**

2 FEI is unable to provide the requested discussion for Alternative 5A. Given the presumptive
3 capital cost (as discussed in the response to CEC IR1 13.1), and the logistical challenges
4 associated with this alternative, no further analysis was conducted.

5

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 40

1 **14. Exhibit B-1, page 45 and 46**

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.

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

Evaluation Criteria	Weighting
Non-Financial	90%
• Schedule Impacts	(54%)
• Community, Indigenous and Stakeholder Impacts	(22.5%)
• Environmental and Archaeological Impacts	(13.5%)
Financial	10%
• Levelized Delivery Rate Impact	

2
3 14.1 Please identify the positions (without names) of the 'subject matter experts'.

4
5 **Response:**

6 Please refer to the response to Burnaby IR1 5.1.

7
8
9
10 14.2 How heavily does FEI normally weight 'Financial' evaluation criteria?

11
12 **Response:**

13 FEI selects and weights evaluation criteria based on specific requirements and risks associated
14 with each project. Historically, FEI has weighted financial evaluation criteria ranging between 10
15 and 35 percent.

16 As explained in the Application, FEI must undertake and complete the Project in advance of the
17 scheduled Pattullo Bridge demolition to continue providing safe and reliable gas service to its
18 customers. Consequently, FEI heavily weighted non-financial criteria, including schedule
19 impacts, as compared to financial criteria.

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 41

1 **15. Exhibit B-1, page 49**

	Alternative 6A: Broadway and Gagardi 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

2
3 15.1 Please provide the average bill impact per year for each customer rate class.

4
5 **Response:**

6 The table below provides the average bill impact per year for FEI's customers in Rate
7 Schedules 1 to 7 based on the levelized delivery rate impact in \$ per GJ over 73 years (as
8 shown in Table 4-6 of the Application). Note that the calculated average bill impact per year is
9 based on the AACE Class 5 capital cost estimates for Alternatives 6A, 6B and 6C. It is not the
10 estimated average bill impact per year of the preferred alternative, which will be based on an
11 AACE Class 4 cost estimate that will be included in the evidentiary update. FEI has excluded
12 transportation customers as the utility does not have insight into their total bill including their
13 commodity charges.

	Avg. Use per Customer (UPC) in GJ	Alternative 6A: Broadway and Gagardi Way Corridor	Alternative 6B: Cape Horn Gate Corridor	Alternative 6C: Fraser Gate Corridor
Average Bill Impact (\$)				
Levelized Delivery Rate Impact Over 73 years (\$/GJ)		\$ 0.036	\$ 0.054	\$ 0.048
Residential				
Rate Schedule 1	90	\$ 3.2	\$ 4.8	\$ 4.4
Commercial				
Rate Schedule 2	340	\$ 12.1	\$ 18.2	\$ 16.5
Rate Schedule 3	3,770	133.8	202.1	182.5
Industrial				
Rate Schedule 4	9,050	\$ 321.3	\$ 485.1	\$ 438.0
Rate Schedule 5	16,240	576.5	870.5	786.0
Rate Schedule 6	2,060	73.1	110.4	99.7
Rate Schedule 7	177,950	6,317.2	9,538.1	8,612.8

FortisBC Energy Inc. (FEI or the Company) Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project (Application)	Submission Date: November 19, 2020
Response to Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 1	Page 42

1 15.2 Please provide the Class level on which the cost estimate was based.

2

3 **Response:**

4 The cost estimate was based on AACE Class 5. Please also refer to the response to CEC IR1
5 3.1.

6